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Cask Testing Protocols

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
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WORKSHOP ON SPENT FUEL STORAGE
CASK TESTING PROTOCOLS
+ + + + +
WEDNESDAY
MARCH 12, 2003
+ + + + +
LAS VEGAS, NEVADA
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The Public Meeting was called to order at the Conference Room of the Clark County Building Department, 4701 West Russell Road, Las Vegas, Nevada, at 10:05 a.m., by F.X. "Chip" Cameron, Facilitator, presiding.

PARTICIPANTS:

MIKE BAUGHMAN, Lincoln County, Nevada
BONNIE BOBB, Yomba Shoshone
RICK BOYLE, U.S. Department of Transportation
CHRISTOPHER BAJWA, NRC
E. WILLIAM BRACH, NRC
JIM CHANNELL, State of New Mexico
MIKE CONROY, U.S. Department of Energy
TOM DANNER, NAC International

1 PARTICIPANTS: (CONT.)
2 FRED DILGER, Clark County, Nevada, NRD
3 ROBERT HALSTEAD, State of Nevada, ANP
4 CASE JASZCZAK, Nye County
5 PEGGY MAZE JOHNSON, Citizen Alert
6 JOHN KESSLER, EPRI
7 JOSIE LARSEN, White Pine County, Nevada
8 CINDY MARQUES, Ely Shoshone Tribe
9 CALVIN MEYERS, Moapa Paiute Tribe
10 ANDREW MURPHY, NRC
11 DIANNE NIELSON, State of Utah
12 JIM PEGUES, City of Las Vegas, Nevada
13 AMY SNYDER, NRC
14 KEN SORENSON, Sandia National Laboratories
15 KALYNDA TILGES, Shundahai Network
16 JUDY TREICHEL, Nevada Nuclear Waste Task Force
17 JOHN WELLS, Western Shoshone National Council
18 DAVE ZABRANSKY, U.S. Department of Energy
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1 P-R-O-C-E-E-D-I-N-G-S

2 (10:05 a.m.)

3 FACILITATOR CAMERON: Good morning. My
4 name is Chip Cameron, and I am the Special Counsel for
5 Public Liaison at the Nuclear Regulatory Commission,
6 the NRC, and I would like to welcome you to the NRC
7 public meeting this morning.

8 And our topic for today is the NRC's plans
9 to conduct full-scale testing of spent fuel
10 transportation casks, and that plan is embodied in
11 this report that all of you should have, the Package
12 Performance Study Test Protocols.

13 And it is my pleasure to serve as your
14 Facilitator for the meeting today, and my general
15 responsibility in that role will be to try to help all
16 of you have a productive meeting.

17 Before we get into the substance of
18 today's discussions, I just wanted to talk a little
19 bit about meeting process issues -- the purpose of the
20 meeting, the format and ground rules -- and go through
21 the agenda for you so you know what to expect today.

22 In terms of why we are here, the first
23 purpose is to clearly explain the NRC plans to do
24 full-scale testing; why are we doing this, what is
25 planned, and how are we going to try to accomplish it.

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1 The second purpose and the most important
2 purpose is to listen to your views and recommendations
3 on these plans. The ultimate goal is to use the
4 discussion today, and any written comments that we
5 get, any comments from other types of public meetings
6 on this issue, and to use those comments to assist us
7 in finalizing the test protocol.

8 In terms of the format for the meeting, we
9 are in what we all a roundtable format, and obviously
10 not literally round, but we have a broad spectrum of
11 affected interests, commonly called stakeholders
12 around the table, and people whose organizations are
13 affected, and concerned, and knowledgeable about these
14 transportation issues.

15 And the purpose of doing a roundtable
16 format like this is that we are fundamentally
17 interested in each person's views on these issues, but
18 in a roundtable we want to try to engage all of you in
19 a discussion of those individual views by others
20 around the table.

21 And we hope that this will give us another
22 perspective, another type of information that we won't
23 get just by reading the individual comments, or just
24 by hearing individual oral comments that are presented
25 at the meetings.

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1 And this leads me to the ground rules.
2 The first one is to try to be focused and concise in
3 your comments today. The roundtable gives us an
4 opportunity to develop a richness of views on these
5 views, but it means that we have to sacrifice going
6 into a lot of detail on your individual comments.

7 And we want to make sure that everybody
8 around the table has an opportunity to express their
9 views and we want to cover all the items on the
10 agenda, and hopefully get us out of here at a
11 reasonable hour at the end of the day.

12 So I would just ask you to try to keep
13 your comments to major points. I know that that can
14 be difficult on these controversial issues, but let's
15 see how we can do with that.

16 If you have a recommendation, please try
17 to give us the rationale behind that recommendation.
18 You have name tags in front of you, and if you want to
19 talk, please put this up on the end, and that will cue
20 me into the fact that you do have something to say,
21 and will relieve you of the burden of having your hand
22 up all the time.

23 Because we want to get the reaction of
24 others around the table to your views, I may not take
25 the cards in the order that they come up so that we

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1 can follow what I call discussion threads, and please
2 only speak one at a time, because we are having a
3 transcript taken.

4 Our stenographer is right over there, and
5 that transcript will be available before the written
6 comment period closes, and so you will have an
7 opportunity to look at that.

8 Now, because we want to try to get a
9 discussion of views, we are in the roundtable format,
10 and the focus is up here, but we know that this is an
11 important issue obviously to all of you who are in the
12 audience.

13 And so at several times during the meeting
14 I will go on to you to see if you have any comments or
15 questions. So we will be out to you for your views.

16 In terms of the agenda for today's
17 meeting, we are going to give you some background
18 first, some relatively brief presentations by the
19 Nuclear Regulatory Commission and our expert
20 consultants, on what are the NRC responsibilities
21 generally for these types of issues, and what is our
22 mission, and why are we doing full-scale cask testing,
23 and some details of what we plan to do.

24 And I will be introducing the speakers in
25 a minute, and we will go to you for questions about

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1 those presentations to make sure that we have as much
2 clarity on this before we go into the discussion.

3 The next item on the agenda is called
4 participant interests, and this is basically just a
5 short statement of your major interests and concerns
6 on this issue. It will provide a foundation for our
7 discussions through the rest of the day, and it will
8 also help us do some agenda building to make sure that
9 we are covering all of the items of importance to you.

10 And again try to keep it to 2 minutes, or
11 3 minutes. I know that can seem like an incredibly
12 short period of time. I know that some people will go
13 beyond 2 or 3 minutes, and some people less. But try
14 to keep it short, and there will be plenty of
15 opportunities throughout the day for everybody to talk
16 on the issues.

17 The first major discussion piece is called
18 overarching issues, and basically we want to take a
19 look at what are the objectives for doing this full-
20 scale testing. There is a number of them stated;
21 public confidence, realism, confirmatory.

22 We want to talk about and hear your views
23 on those objectives, and how you define them, for
24 example, and what does public confidence mean. How do
25 you build public confidence in terms of a program like

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1 this.

2 What are the relationships among the
3 objectives in terms of full-scale testing. Do you
4 have to do different types of testing to gain public
5 confidence, whatever that is, and then what you would
6 need to confirm the NRC's models that are used in
7 licensing.

8 And this is also going to be the time I
9 think to talk about advantages and disadvantages of
10 full-scale testing, and some of you are going to have
11 proposals on how to do it differently than what the
12 NRC has proposed.

13 And we are here to listen to that and to
14 consider that before we go on to develop a final plan.
15 We will finally get to lunch, and that is an hour-and-
16 a-half, and so I think that should give you plenty of
17 time for lunch.

18 And then we are back to look at a couple
19 of general testing issues, types and numbers of casks,
20 for example; and that should be pretty short. We then
21 go to the discussion of the aspects of the test
22 protocol on fire testing.

23 And for each of these discussion areas, we
24 are going to have a member of the NRC staff do what I
25 call tee the issue up, so that you understand what the

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1 major issues of concern to us are there, and Amy
2 Snyder, who is here, and who will introduce herself in
3 a minute, is going to tee that up for us.

4 We do have some -- we know that there is
5 a lot of interest in something called the Baltimore
6 Tunnel fire, and we do have some data on that and we
7 are going to have Mr. Chris Bajwa from the NRC staff,
8 a thermal engineer, tell us what the NRC has looked at
9 there.

10 And also besides, I know that there are
11 probably other people that have expertise on that, but
12 Fred Dilger and Bob Halstead up at the table, who have
13 just done a paper on that, and we can probably make
14 available.

15 Okay. After fire testing, we take a
16 break, and then we are going to come back to impact
17 testing, and discuss that, and then see if there is
18 any other issues.

19 And there may be process issues of
20 concern, and I think we probably should discuss that
21 during the overarching issues, and by process issues,
22 I mean what types of public input, further public
23 involvement should there be as the NRC develops these
24 test protocols and actually implements them.

25 And I think that people will have ideas on

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1 that. I would just thank all of you for taking the
2 time to be here today and let's just go around the
3 table quickly and introduce ourselves.

4 You will get a chance to tell us about
5 your interests and concerns later this morning, but
6 let's just find out who everybody is, and then I will
7 introduce Bill Brach, and we will go to the first
8 presentation. Amy, do you want to start?

9 MS. SNYDER: Good morning, everyone. I am
10 Amy Snyder, and I am the project manager for the spent
11 fuel project office, the NRC spent fuel project
12 office, and I am glad that you could come here to
13 listen to your comments, and ideas, and consider them.
14 Thank you.

15 MR. DANNER: Good morning. My name is Tom
16 Danner, and I am with the NAC International, a cask
17 supplier to our industry. I represent the engineering
18 and licensing part of the business, and hope to be
19 able to be a compliment to the program.

20 MR. BOYLE: Good morning. I am Rick
21 Boyle, and I work with the U.S. Department of
22 Transportation in their hazardous material safety
23 office, and I head up their radioactive material
24 transport branch. Thank you.

25 MR. HALSTEAD: I am Bob Halstead, a

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1 Transportation Advisor to the State of Nevada's Agency
2 for Nuclear Projects.

3 MR. DILGER: I am Fred Dilger with Clark
4 County, Nevada, and I am the transportation advisor
5 for Clark County, Nevada, as it relates to nuclear
6 waste shipments.

7 MS. JOHNSON: Good morning. I am Peggy
8 Maze Johnson, and I am the executive director of
9 Citizen Alert. We are an organization that has been
10 in Nevada for 27 years fighting the transportation of
11 nuclear waste to our State.

12 MS. TREICHEL: Judy Trichel, Nevada
13 Nuclear Waste Task Force. Thank you.

14 MR. KESSLER: John Kessler, manager of
15 EPRI's spent fuel and high level waste disposal
16 program.

17 MR. SORENSON: Good morning, Ken Sorenson,
18 Sandia National Laboratories. We are the technical
19 support organization for the NRC on this program.

20 DR. MURPHY: I am Andy Murphy, with the
21 NRC research office, and I am the project manager for
22 the package performance study.

23 MR. BRACH: Good morning. I am Bill
24 Brach, and I am the director of the NRC's spent fuel
25 project office.

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1 MS. TILGES: Good morning, Kalynda Tilges,
2 executive director, Shundahai Network.

3 MR. PEGUES: Good morning. I am Jim
4 Pegues representing the City of Las Vegas, and I would
5 like to welcome everyone from out of town.

6 MR. WELLS: Good morning. I am John
7 Wells, and I am the Southern Representative to the
8 Western Shoshone National Council, which is the
9 traditional government of the Western Shoshone Nation.

10 DR. BOBB: Good morning. My name is Dr.
11 Bonnie Everhart Bobb, and I am the director of the
12 Office of Environmental Protection of the Yomba
13 Shoshone Tribe, which is under the Shoshone Nation.

14 MR. MEYERS: I am Calvin Meyers, from the
15 Moapa Paiutes and I am the Environmental Coordinator
16 for the tribe.

17 MS. MARQUES: Hi, I am Cindy Marques, and
18 I am Western Shoshone, and I work for the Ely Shoshone
19 Tribe as an environmental specialist.

20 MR. ZABRANSKY: I am David Zabransky from
21 DOE's Radioactive Waste Management Program.

22 MR. CONROY: Good morning. I am Michael
23 Conroy from the U.S. Department of Energy, Office of
24 Environmental Management, Office of Transportation.

25 MS. LARSEN: I am Josie Larsen, Director

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1 of White Pine County's Nuclear Waste Project Office.

2 MR. BAUGHMAN: Mike Baughman, Lincoln
3 County, Intertech Services, and designated by the
4 Secretary of Energy and host of one of the sites
5 identified by DOE for rail and truck transportation of
6 radioactive waste.

7 MR. CHANNELL: Jim Channell, Deputy
8 Director of the New Mexico Environmental Evaluation
9 Group. I have been involved in all kinds of
10 transportation waste shipment issues for over 20
11 years.

12 MR. JSASCZAK: I am Cash Jsaszak, and I
13 am here substituting for Mal Murphy, who normally
14 would represent the Nye County Natural Resources and
15 Federal Facilities Office.

16 MS. NIELSON: I am Diane Nielson, and I am
17 the executive director of the Utah Department of
18 Environmental Quality and the State's contact on the
19 present fuel storage proposal.

20 FACILITATOR CAMERON: Okay. Thank you,
21 and thank you, Diane. I thank all of you. You can
22 see that we have an impressive group of people around
23 the table today, and I just wanted to add one thing in
24 terms of John Kessler.

25 EPRI is the Electric Power Research

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1 Institute, and I don't know who is more actively
2 involved in this testing program than other places,
3 but I know that there is a lot, and so we will try to
4 make sure that we tell people what those acronyms mean
5 as we go along today.

6 And let me introduce Bill Brach. He
7 already told you that he is the Director of the Spent
8 Fuel Project Office, and that is the key organization
9 within the Nuclear Regulatory Commission that handles
10 the regulatory aspects of spent fuel transportation
11 and other issues.

12 And Bill has been with the NRC and the
13 Atomic Energy Commission, the AEC, the predecessor to
14 the NRC, for 30 years. And he originally started out
15 back at -- I was going to say the turn of the century,
16 but it was 1971, as an inspector in the AEC's Oak
17 Ridge, Tennessee, field office.

18 He has been involved in almost every
19 aspect of NRC regulatory activities. Safeguards,
20 licensing issues, vendor inspections, reactor
21 licensing, performance evaluation, low level waste and
22 decommissioning, and the medical and industrial use of
23 nuclear materials.

24 So he has managed all aspects of these
25 programs, and since 1999, he has been the Director of

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1 the Spent Fuel Project Office, and I will turn it over
2 to Bill at this point.

3 MR. BRACH: Good morning everyone. I
4 didn't feel old until I listened to Chip, and with his
5 turn of the century comment, I am not quite that
6 dated. But again good morning, and on behalf of the
7 NRC, I want to welcome all of you to today's
8 roundtable discussion, and our workshop on spent fuel
9 transportation package performance study.

10 As Chip mentioned, I am the Director of
11 the Spent Fuel Project Office, and our office licenses
12 and inspects interim storage facilities for spent
13 nuclear fuel, as well as the certification of
14 transportation of radioactive material, including the
15 transportation of spent fuel.

16 The NRC's principal and guiding mission is
17 protecting public health and safety, common defense
18 and security, and the environment. The NRC's primary
19 role in transportation of spent fuel to a repository
20 would be certification of packages used for
21 transportation.

22 I believe the NRC is well positioned to
23 maintain its independent focus on maintaining safety
24 in this important activity. The NRC staff believes
25 that shipments of spent fuel in the U.S. are safe

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1 using the current regulations and programs.

2 I believe that is an important point, and
3 let me repeat that, because I think it is important to
4 be sure that we have that as a backdrop if you will
5 for our discussions later today on the package
6 performance study.

7 We on the NRC staff believe that the
8 shipments of spent fuel in the U.S. are safe using the
9 current regulations and current programs. This belief
10 is based on NRC's confidence in the robustness of the
11 shipping containers that we certify, and the ongoing
12 research in transportation safety.

13 And also as noted in the third bullet in
14 the overhead, this confidence is based on industry's
15 compliance with safety regulations and the conditions
16 of certificates that has resulted in an outstanding
17 transportation safety record.

18 We have been studying the issue of
19 transportation safety for more than 25 years, and we
20 continually find that the likelihood of release from
21 an accident and the associated risks to the public are
22 extremely low.

23 Even so the NRC continues to be vigilant
24 about transportation safety as an essential part of
25 our mission. The NRC follows an aggressive program to

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1 investigate and assess the continued safety of spent
2 fuel shipments, including analyzing spent fuel
3 transportation experience, and records, to better
4 understand safety issues.

5 Evaluating new transportation issues, such
6 as the potential for increased shipment levels,
7 increased and changing cask contents, populations
8 among the routes, and other factors, as well as using
9 new technology, such as enhanced modeling and analysis
10 tools to estimate the current and future levels of
11 potential risks to the public.

12 The package performance study, or the PPS,
13 and I apologize, as Chip has mentioned, we use a lot
14 of acronyms, but PPS is one that we will be using
15 quite prevalently today, and that is the package
16 performance study, an important part of the NRC's
17 confirmatory research program for spent fuel
18 transport.

19 The Office of Nuclear Regulatory Research
20 has the NRC lead for the study, with assistance from
21 our office, the Spent Fuel Project Office, for
22 problematic direction, as well as public outreach
23 activities.

24 I want to be clear that we recognize that
25 some stakeholders do not share the NRC's confidence in

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1 its regulatory programs. We believe that the package
2 performance study can be appropriately used for others
3 to understand, and I will add to hopefully gain and
4 share in our confidence.

5 I want to provide now just a very brief
6 overview of the package performance study from its
7 inception, leading up to our meeting today. The
8 package performance study began with a series of
9 public meetings to collect views on possible future
10 work and shipments of spent fuel, and to identify
11 possible follow-on work through a new regulatory
12 report, CR 6672 that we issued in March of 2000.

13 In 1999, we had our first series of public
14 meetings. After the first set of these four public
15 package performance study meetings, the NRC published
16 what we call the issues report in June of 2000.

17 Now, this report compiled stakeholders
18 input obtained from the four public meetings held in
19 1999, and from letters and e-mail comments that we
20 received.

21 The comments from the stakeholders on the
22 issues report included nuclear industry groups,
23 transportation industry groups, the Departments of
24 Energy, the Department of Transportation, the State,
25 local and tribal governments, public interest groups,

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1 and members of the public.

2 I will note as well that many of the
3 people at our roundtable discussion today were
4 participants in these meetings in 1999 and their
5 comments were reflected and considered as we are
6 moving forward in this study.

7 Now, to discuss whether the issues reports
8 accurately captured the comments and suggestions, and
9 to discussion recommendations to resolve the comments,
10 four additional public meetings were held in the year
11 2000.

12 After these meetings, the NRC took the
13 issues report, the recommendations and comments, and
14 began an extensive what we call planing phase for the
15 package performance study.

16 The first major product of this planning
17 phase for the package performance study is the topic
18 of today's meeting, and that is to present the draft
19 test protocols, and to receive your comments, your
20 views, and your suggestions.

21 At our first meeting on the draft test
22 protocol, which was last week and held in Rockville,
23 we heard from stakeholders that it was not clear what
24 we mean each time we stated that the package
25 performance study was in part developed to improve

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1 public confidence.

2 The following are a few of the comments on
3 the project that we hope can do this. First, I would
4 like to emphasize that the package performance study
5 is the first large NRC research project with
6 significant public input and participation in the
7 scoping, the planning, and the protocol development.

8 And as we will be discussing later today
9 that public participation is envisioned to carry
10 forward into the test conduct and evaluation, and the
11 end results.

12 We are attempting to provide information
13 to the public about how the tests relate to current
14 regulatory requirements, and will demonstrate further
15 how the NRC certified and approved designs are even
16 under conditions that exceed regulatory design
17 requirements.

18 It is important that we consider the test
19 conditions and ensure that we create them to real
20 accidents and real live conditions, so that all of us
21 can understand what the tests represent and what they
22 don't represent.

23 We as well need to convince ourselves, as
24 well as stakeholders, that the program is an
25 appropriate use of taxpayers and ratepayers money, and

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1 that the tests are useful and meaningful.

2 In the conduct of the study, we provided
3 feedback on public inputs and we modified plans based
4 on comments and suggestions from our stakeholders. We
5 as well plan to invite stakeholders to witness the
6 tests, and to see firsthand and better understand the
7 conduct and the results.

8 Reports and other communication tools were
9 used to inform stakeholders about the results, and
10 what we would do with them as a regulator, and how
11 they will affect the safety of future shipments of
12 spent fuel.

13 Now, what do I see as a success for
14 today's meeting. The package performance study draft
15 test protocols report summarizes the fuel tests that
16 the NRC has proposed to perform under the study as the
17 policy analysis to be performed to develop the test
18 summaries.

19 The tests that we propose involve
20 previously NRC certified and developed cask designs,
21 and are not directed, and are not related to the NRC
22 certification of any specific task design. We have
23 issued this report for a 90 day public comment period,
24 which ends on May 30th of this year.

25 And the report and comment period were

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1 announced in the Federal Register that we published on
2 February 21st, along with many notices, a press
3 release, and a mass mailing of over 500 copies of the
4 package performance study test protocols to those on
5 our mailing lists.

6 The report is as well available on the PPS
7 website. I would add that if you are not on the
8 package performance study mailing list, and would like
9 to be, please sign up with the staff at the desk, or
10 with any of the NRC staff that are here with us today.

11 The purpose of today's public meeting is
12 to obtain comments on these draft proposals. I
13 emphasize that no decisions have been made yet, and
14 let me repeat that as well. This is a major topic,
15 where we spent some time discussing at the meeting
16 in Rockville last week.

17 The draft test protocols are drafted as
18 protocols. We have not made decisions on what tests
19 for the parameters and conditions for the test, and
20 the purpose of our meeting today was to ask for your
21 views, comments, and suggestions so we can consider
22 them as we move forward.

23 As Chip mentioned, I am happy to see such
24 a large group of qualified participants on the panel,
25 on the roundtable, as well as in the audience, and I

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1 am confident and hopeful that the comments will help
2 the NRC develop the best and most appropriate test
3 plan for the package performance study.

4 And finally let me know that we are also
5 interested to hear from you if you found that this
6 meeting and its format are useful and productive or if
7 not.

8 The meeting evaluation forms are at the
9 back or at the side table with the other handouts, and
10 I would encourage you to please if you could to take
11 the time and fill those and give us feedback on your
12 perspectives on today's meeting, as well as
13 suggestions if you feel that there are areas for
14 improvement, and how we could modify or change these
15 meetings to make them more productive.

16 However, if you opt not to provide the
17 valuation forms, but you will later be providing
18 written comments to us on the draft test protocols, I
19 would encourage you as well that it is acceptable to
20 include any comments on the conduct of tonight's
21 meeting in those comments as well.

22 I thank you and look forward to a very
23 productive meeting.

24 FACILITATOR CAMERON: Thank you, Bill, and
25 I would just ask all of you to just bear with us and

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1 let us get the rest of the context out, and then we
2 will go for questions for everybody.

3 And I wanted to remind people, and I don't
4 think that I emphasized this before, is that because
5 we are taking a transcript, obviously anything that
6 you are going to say is going to be recorded on that
7 transcript, which will be publicly available.

8 And when we do go out to the audience I
9 would jus ask you to give your name and affiliation,
10 if appropriate, so that we can have that on the
11 record. Yes, Bob?

12 MR. HALSTEAD: Chip, when is that
13 transcript going to be available do you think?

14 FACILITATOR CAMERON: Good point. When
15 will the transcript, for example, from the Washington
16 meeting be available, and when will this one be
17 available, and in one form.

18 And I am getting seven working days from
19 the stenographer, who has to do the work, and so that
20 is probably a good data point there. Seven days to
21 the NRC, okay? And when this will be available on the
22 website or for distribution?

23 STAFF MEMBER: I don't have an exact date,
24 but we do get an electronic copy of the documents, and
25 so we will put that on the website as soon as

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1 possible.

2 FACILITATOR CAMERON: Okay. For this
3 meeting, it should be available and on the website by
4 the end of next week. And the transcript of the
5 Washington, D.C. meeting -- Amy, can you answer that?

6 MS. SNYDER: Yes, I can answer that. What
7 we will do is put the transcripts from each meeting on
8 the package performance website, study website, and in
9 addition it will be on the Adams Systems, and we will
10 do that within a few days from when we get it from the
11 court reporter.

12 FACILITATOR CAMERON: So possibly the
13 beginning of next week. Judy.

14 MS. TREICHEL: Well, I will hold off on my
15 questions until the other speaker speaks and you are
16 opening it up, but change the word storage on the top
17 of the agenda to transport. We are not here to talk
18 about spent fuel storage casks, I think.

19 FACILITATOR CAMERON: That is a pretty
20 excellent point, Judy. Thank you, and so noted,
21 right?

22 MR. BOYLE: Our apologies.

23 FACILITATOR CAMERON: Okay. Let's go to
24 -- we are going to go to Dr. Andy Murphy, who is from
25 the Office of Nuclear Regulatory Research, and he is

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1 the project manager for this study. And as Bill Brach
2 pointed out the spent fuel project office is assisting
3 the Office of Research with this project.

4 Andy's career has been 24 years with the
5 NRC, and his career has been focusing on earth
6 science, seismic, and structural engineering issues.
7 And he has managed a lot of large scale test programs
8 for reactor systems, and components, and other types
9 of activities, and that's why he has good expertise in
10 terms of managing this particular testing program.

11 And before he joined the NRC, he was a
12 research scientist at Columbia University at the
13 Lamont Doherty Earth Observatory there. His bachelors
14 degree is in geophysical engineering, and has a
15 graduate degree in seismology, and Andy, I will turn
16 it over to you now.

17 DR. MURPHY: Good morning. I would like
18 to welcome all of you, and this first view graph
19 indicates that we are talking about transportation
20 casks, and that's for sure, and we are going to be
21 talking about a program that we refer to as the
22 package performance study.

23 I will try not to hit you with the jargon
24 of the PPS too often. The other folks listed on there
25 are the ones that have worked with me in developing

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1 the test protocol plans that we will be talking about
2 today.

3 We have mentioned the Federal Register
4 notice for this program for the test protocol report
5 that we will be talking about, and there are a number
6 of names and contacts listed in there. I am giving
7 you this as the principal point of contact or the plan
8 of contact of last resort.

9 Remember this one, because I will make
10 certain that if you have questions or comments that
11 they will be answered. So what topics am I going to
12 be talking about this morning?

13 That is the objectives of the program, and
14 our current status, the staff proposal, and we will be
15 talking about both the impact and the fire tests, and
16 some specific issues that the staff has identified for
17 which we are looking for a comment from the public.

18 And the public here means everybody, and
19 that includes on both sides of the public table, in
20 the United States and internationally. This is a very
21 large and important program, and we are seeking
22 comment so that we are able to do the best program
23 that is possible.

24 And I think you heard that this is an
25 expensive program, and we are trying the best that we

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1 can to get all the input so that we can get it right
2 when we carry it out.

3 The objectives. We have talked about
4 these again a little bit this morning, and we will
5 mention it one more time, is that we are attempting
6 the best that we can to enhance the public confidence
7 in the NRC's ability to safely regulate the transport
8 of spent nuclear fuel.

9 We are trying to impress upon you the
10 inherent safety of the certified casks. We are also
11 trying to validate the codes and models that we use to
12 look at how these casks will respond in the case of
13 accidents.

14 We will be carrying out what we call
15 extreme mechanical and thermal tests on these
16 packages, and we are carrying this out to validate
17 them, and to enhance public confidence, and also to
18 refine the data that we have available for us to carry
19 out risk estimates.

20 Ken Sorenson in a moment will make a
21 reference to NUREG CR 6672, which is a recent study
22 carried out by the NRC, or commissioned by the NRC and
23 carried out by Sandia to look at risk estimates.
24 We wish to refine the calculations there.

25 We are also interested in emphasizing the

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1 need to accept some level of realism in the accident
2 scenarios, or the accidents that we take a look at,
3 and the conditions that we take a look at in these
4 test programs, or in this test program.

5 Let me come to that point a little bit
6 later as it came up with the others. The next view
7 graph. The status. I wanted to tell you that at this
8 stage that the staff does have a proposal on the
9 table, and it has been published as the NUREG that we
10 are talking about today, 1768, and that is our
11 preliminary draft test plan.

12 The staff, with the assistance from
13 Sandia, has put considerable thought and effort into
14 developing a specific test plan, test proposal, and it
15 represents at this stage a lot of effort and the best
16 thinking that we have been able to put on to this
17 program.

18 As Will indicated, this is our best
19 effort, but we are very definitely interested in
20 getting public comment. If we can, and I suspect we
21 can, improve this package, we want to do that before
22 it is carried out.

23 Just one more time. The package is
24 available. If you have access to the internet, the
25 address listed on there will give you direct access to

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1 the protocol report, and there is a link at that site
2 to take you to a comment page, where you can simply
3 thread in anonymously if you want your comments on the
4 protocol report that will be recorded, and will be
5 available to the staff to evaluate and to implement as
6 appropriate.

7 Bill did mention, and I will mention it
8 one more time, that we have got it out for a 90 day
9 public comment period, and that goes until the end of
10 May. What is going to happen with the comments when
11 they come in, we will use them as I said to develop
12 the detailed test plans and procedures.

13 What we are going to actually be doing
14 with these casks, with full-sized casks, with partial
15 cask models, and then we will be making that detailed
16 plan available, and probably again through the
17 internet and through printed media as well.

18 The Staff's Proposal. Okay. We are going
19 to be doing a test or plans to do a test on a rail
20 cask, as well as a truck cask. We have selected the
21 Holtec rail cask as a cask to potentially be used in
22 the program.

23 It is not fixed, and we have to pick a
24 cask in order to carry out the realistic simulations,
25 the calculations, the analysis, that we are required

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1 to put together this test protocol, but it does not
2 amount to I'll say a specific endorsement of the
3 Holtec cask or a commitment to use the Holtec cask at
4 this stage.

5 Back in our meeting, one of our public
6 meetings, at the time of the issues report, one of the
7 NRC staff managers made a commitment that we would be
8 using a cask that was certified and that a reasonable
9 prospect of being used for actual shipment.

10 It was not going to be an obsolete cask
11 sitting in the boneyard someplace. The points about
12 the rail impact test that we will be using, and we are
13 proposing to use an actual cask, a precise cask, and
14 we will be dropping it from a tower.

15 This tower will be 250 to 300 feet tall,
16 and we will be dropping that so that we can obtain an
17 impact velocity of 75 miles an hour. Our plans are to
18 drop the cask, and I don't have my coke can, but to
19 drop it on an angle so that the corner lid of the cask
20 hits first, and what is called a CG, center of
21 gravity-over-corner impact.

22 We will be dropping it to obtain at this
23 stage a proposed speed of 75 miles an hour on to an
24 unyielding surface. The unyielding surface has been
25 chosen so that we do not have to model what happens to

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1 mother earth when we drop this thing on it.

2 The analysis is complicated enough, and
3 just simply looking at what the kinetic energy from a
4 fall does to the cask, and we do not want to
5 complicate our program, and our analysis, to try to
6 decide what happens to the ground when this thing hits
7 it.

8 That is why we have gone to an unyielding
9 surface, and the unyielding surface also has the
10 effect of basically doubling the impact speed of the
11 cask when it hits this target.

12 So we are talking about the equivalent of
13 about 150 mile an hour collision between the cask and
14 a target. The package at this time as we propose will
15 carry at least one surrogate fuel assembly, and what
16 do I mean by a surrogate fuel assembly?

17 And that is a fuel assembly that would be
18 basically visually indistinguishable from an actual
19 fuel assembly, except that it will not have actual
20 spent fuel on it. We will have a replacement for
21 that.

22 In the case of the Holtec cask for the
23 pressurized fuel, the pressurized reactor fuel, that
24 cask holds 24 assemblies, and we propose to have one
25 of those assemblies be the surrogate, and the other 23

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1 would be dummies.

2 And basically they would just be simply
3 rate and density replacements for the fuel assemblies.
4 Next is just a simple representation of the Holtec Hi
5 Star 100 rail cask, and that is this fellow here, made
6 of about at least five layers of -- this shows six,
7 but five layers of steel, and the lid, and the
8 shielding.

9 And on this side you have the multipurpose
10 canister, shown be in inserted into the cask, and if
11 we do the Holtec as proposed, we will be using MPC, a
12 multipurpose canister, in that unit.

13 This is what a Holtec looks like on a rail
14 car. The carriage actually for the rail car for
15 actual shipment would not be this one. The cask would
16 be at a much lower center of gravity, down in this
17 area, and so it is a different carriage there.

18 The proposal for the truck carriage, or
19 the truck impact, and we will be making use of a
20 General Atomic GA-4 truck cask. Again, we will be
21 using an actual cask, and we will drop it from the
22 tower, and the orientation, and some have been calling
23 it a backbreaker, but this is an orientation that will
24 bypass the impact limiters.

25 If you take a look at the model that is

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1 outside on the truck, that would be dropped like it is
2 shown, and then there would be a projection like a
3 concrete couvert, and it would be a semi-circle, semi-
4 cylinder, and probably clad in steel, with concrete on
5 the inside.

6 So again it would be an unyielding part of
7 the target, and it would again be mounted on the
8 unyielding target that we would be using for the rail
9 cask.

10 The orientation, again, a backbreaker; and
11 proposed speed, 75 miles an hour on to an unyielding
12 surface, and again this would be like I said
13 equivalent to 150 mile an hour collision.

14 We would have one surrogate assembly in
15 there, and that is one of out four, and so three of
16 them would be dummies. Here we have a nice color
17 picture
18 of what the GA-4 looks like, with the impact limiters,
19 and the fuel assemblies in here, and the various other
20 components that make up the unit.

21 The staff is proposing to carry out a
22 thermal test, and the thermal test will follow in the
23 sequence after the impact test. We will be testing
24 both casks, and we will be using a fully engulfing,
25 optically dense, hydrocarbon fire. What does that

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1 jargon mean?

2 That means that the cask will be fully
3 surrounded by the fire, and that you will not be able
4 to see through the fire to the cask. What difference
5 does that make?

6 Well, that means that physically the heat
7 that is generated is not -- is in effect all going
8 into the cask. But that the fire that is surrounding
9 the cask will go into making the cask hot, and with
10 that stumbling, I will say that Chris Bajwa a little
11 bit later on will give you a far better explanation of
12 that.

13 And the hydrocarbon fire, that's easy, and
14 that just simply means that it will be an oil-based,
15 jet fuel-based, fire. The duration that we are
16 proposing at this stage is more than a half-an-hour.

17 The half-hour would be necessary for us to
18 see the trends in the heat up of the cask at various
19 points within the cask system; on the inside, and the
20 outside, and on the assemblies and so forth.

21 So that we would have a very good idea of
22 what is happening, and how the cask is heating up, and
23 how the energy from the fire is getting the cask to
24 raise its temperature.

25 Specific issues for comment. These are

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1 listed several times in the protocol report, and so I
2 will not go through them here, but Will mentioned
3 something -- this is a change from the viewgraph that
4 we used in Washington.

5 We observed that there was considerable
6 comment that we should be thinking about testing for
7 failure. This is an issue that we had not previously
8 identified and put on here, and so making emphasis
9 here that we would be interested, very interested, in
10 getting comments on the proposal to test the cask for
11 failure.

12 There is obviously also the question in
13 that what does failure mean for this particular
14 condition, but again a point being added to the
15 comments. And that concludes my presentation at this
16 time. Thank you.

17 FACILITATOR CAMERON: All right. Thank
18 you very much, Andy. We have one more presentation
19 for you, and then we will go to you for questions.
20 Our next presentation is going to be by Mr. Ken
21 Sorenson, and he is going to give you some more
22 specifics on the test protocol.

23 And as I mentioned, we are getting some
24 expert help from Sandia National Laboratories, and Ken
25 is from the Sandia National Laboratories, in the

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1 Transportation Risk and Packing Department.

2 And that help involves computer analysis
3 on how a cask might perform, and testing of casks,
4 risk assessment. And he is on the editorial board of
5 the International Journal of the Transportation of
6 Nuclear Materials Packages.

7 And he is also the chairman of the Package
8 and Transport Division of the Institute of Nuclear
9 Material Managment. And he has a Bachelors degree in
10 Civil Engineering from the University of Arizona, and
11 a Masters degree in Civil Engineering from the
12 University of Arizona.

13 He also has a Masters of Business
14 Administration from the University of New Mexico, and
15 with that, Ken, go ahead.

16 MR. SORENSON: Okay. Thank you, Chip.
17 Good morning everybody. On behalf of Sandia, it is a
18 pleasure to be here this morning, and we are looking
19 forward to the discussion and also to getting your
20 comments and feedback.

21 At our meeting last week at the NRC
22 headquarters, I think we had a very good day, and as
23 Andy mentioned, we had a lot of good feedback I think,
24 and already we are starting to look at that, in terms
25 of how we can construct the protocols, and then the

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1 testing, so that we meet the broadest range of issues
2 and concerns to meet the objectives of the package
3 performance study.

4 As I said earlier at my introduction at
5 the table, Sandia is the technical organization
6 supporting the NRC on the package performance study.
7 All the analysis that you see in the protocols was
8 done at Sandia, and I do recognize those who actually
9 produced the analysis and the reports, and those are
10 Doug Ammerman and Bob Kalan, Carlos Lopez, and Jeremy
11 Sprung.

12 My way of background, I would like to form
13 a little time bridge if I may between the year 2000
14 and where we are today with the protocols. In 2000,
15 as Bill Brach mentioned earlier, is when we issued the
16 reexamination of spent fuel shipment risk estimates,
17 and that is in NUREG CR6672, and if you would indulge
18 me, I will just call it 6672 at this point.

19 And we used these estimates at public
20 meetings, and I will talk more about the public
21 meetings, because it is important, because they have
22 a lot to do with where we are today in protocols. But
23 we used a series of public meetings before the 6672
24 was published, and then four weeks after 6672 was
25 published, to get comment and feedback on the

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1 document.

2 And to use that then as a springboard to
3 go forward with the package performance study. And
4 indeed these public comments that we got really did
5 set some stakes in the ground that provided some
6 guideposts for us to structure what you see today, in
7 terms of giving us some direction, general direction,
8 on how best to proceed.

9 In those meetings, there is really -- it
10 all boils down to two little basic comments that we
11 got back, both from the technical people and from the
12 public, and first of all that is shown is that you
13 need to do a better refined analysis to better capture
14 a transport cask response to these very severe
15 mechanical and thermal environments.

16 It is important to point at this point
17 that 6672 and the protocols right now as they are
18 structured, do not cover loading conditions as
19 specified in the NRC Regulations, 10 CFR 71, and they
20 are mainly conditions that are more severe than the
21 conditions that are in the regulations.

22 The second general comment that we got was
23 that it was important to do field testing, and to
24 demonstrate the ability of the analyses to capture
25 cask response in these very severe mechanical and

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1 thermal environments.

2 And also to provide a demonstration of the
3 robustness of the designs, and the result in casks in
4 these very severe moving environments. After the
5 round of public meetings, we assimilated all the
6 comments and put them out as an issues report, and
7 that literally provided the benchmark for us to go
8 forward and structure the package performance study.

9 The issues report was phase one in the
10 package performance study, and now the second part as
11 you see today is the protocols. In the issues report,
12 there is five main recommendations that came out, and
13 that again kind of formed the basis of where we are
14 today in the structuring of the protocols.

15 The first two are to perform very refined
16 comprehensive 3-D computer analyses to capture the
17 cask behavior in extreme mechanical and thermal
18 loading environments.

19 Some of the comments that we got back from
20 6672 was that, for example, that the fire analysis
21 that we used was a one-dimensional fire analysis, and
22 we had a lot of comment that you really should do a
23 better 3-D type of analyses.

24 For the mechanical loadings, we had to --
25 for the clonal end of the modeling for the cask, we

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1 had a relatively coarse model that was due to some
2 funding and schedule constraints.

3 And so that was recognized and it was one
4 of the public issue comments that we got, and
5 recommended in that issues report that we needed to do
6 a more refined 3-D analysis of the mechanical loadings
7 on the cask as well.

8 And then we heard a lot that you need to
9 do testing, and not just any old testing. You need to
10 do testing of casks that would be currently certified
11 NRC casks, and it would be casks that would be used
12 for large transportation campaigns, and like to Yucca
13 Mountain, for example.

14 And so one of the main recommendations is
15 to do testing, and to do it both for mechanical
16 impacts and also for the thermal tests. The test
17 protocols that you have today are the proposed test
18 parameters for your review and comment.

19 After we assimilate the comments that we
20 get from the public meetings that we have, then we
21 will develop some defined test procedures that will
22 actually define the tests that we will then conduct.

23 The fourth comment was to conduct fuel
24 testing experiments to see how the actual fuel
25 assemblies themselves performed in these severe

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1 mechanical and thermal environments. There is not a
2 lot of test data available frankly in terms of how
3 fuel assemblies perform under these extreme loading
4 environments.

5 And that, fifth, is to reconstruct the
6 accident event trees and accident speed and fire
7 duration distributions. A lot of comment that we got
8 back that the data that has been used in 6672 and
9 previous reports is dated. It is 15 years later, and
10 there have been changes in important things, like
11 speed limits have changed from 55 to 70 or 75 miles an
12 hour.

13 And so it is important to go back and look
14 at those accident distributions and make sure that
15 there has not been any dramatic changes, or if there
16 have been, to incorporate those in the risk studies.

17 The protocol that you see before you
18 really involve the first three recommendations.
19 Recommendation 4 and 5 from the issues report are not
20 part of the test protocols. The impact tests on the
21 fuel is on a different schedule, and the accident
22 event trees and the accident speed and fire duration
23 distributions is not a test activity, and so that
24 would be performed separately from what you see in the
25 protocols.

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1 So today's discussion really does revolve
2 around the first three recommendations; the computer
3 code analyses for the severe mechanical and thermal
4 environments, and also then the type of testing that
5 is being proposed.

6 So the document that you have before you
7 today, the test protocols, the three main functions of
8 that document is basically to stimulate your thinking
9 on how to perform, or to develop, or to define these
10 tests that we have proposed.

11 And part of that is to identify candidate
12 casks for the tests. In the issues reports, you may
13 recall that we talked about one cask test with a rail
14 cask in the protocols, and that has been changed, and
15 there is actually now discussion about doing both the
16 rail cask and the truck cask tests.

17 In the protocols, we describe the concepts
18 for the impact and the fire tests. You may read
19 these, the protocols, and be thinking to yourself that
20 there is not a lot of definitions, in terms of what is
21 the failure criteria, and those sorts of things, and
22 there is a range in speed for the impact.

23 And we did that on purpose. We didn't
24 want to set specific test parameters. We really
25 wanted to provide more of a range so that we could get

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1 public impact or public discussion on that.

2 And then we used computer analyses again
3 to help define the orientation of these candidate cask
4 drops, and speed, and those sorts of things. And then
5 finally we used the protocols to solicit public
6 opinion or for public comment.

7 I have a couple of pictures of the
8 computer code analyses here, and again just to
9 stimulate a little bit of thought on your part for the
10 discussion period. This is a picture of the Holtec Hi
11 Star cask, and Andy talked about the center of
12 gravity-over corner impact, and basically tried it up
13 instead of down.

14 But anyway it is to represent or simulate
15 a drop test enter of gravity-over-corner of the cask,
16 and with the impact limiter, and you can see that we
17 get a lot of good information out of the impact
18 limiter.

19 This is at 75 miles per miles and which is
20 the recommended drop speed for the high speed impact
21 test in the protocols. This graph here shows the
22 acceleration on the cask, and we did body acceleration
23 on the cask or deceleration if you will as a function
24 of time.

25 And this plot is the actual deceleration

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1 of the cask, and this is all through analysis again.
2 And you will see that we get an acceleration of that
3 cask at about 100 G's. We also did a drop test
4 analysis on the very same cask at the regulatory 9
5 meter drop, and that resulted in an acceleration on
6 the cask, and reached an acceleration of about 30 G's,
7 a little over 30 G's.

8 So as you can see, in this particularly
9 recommended orientation for this particular design,
10 the speed, we really do have a severe test on this
11 particular package relative to the 9 millimeter drop
12 test in the regulations.

13 This is the GA-4 truck cask, and as was
14 mentioned earlier, this was a decision by the NRC to
15 include the truck cask after the issues report was
16 actually published. We were looking for an
17 orientation, a drop test, that would provide us some
18 new information relative to what we were planning on
19 getting with the rail test. But we just did not want
20 to repeat the same test.

21 And this is an example of how the issues
22 report in the public comment period really helped in
23 deciding that on this particular orientation, because
24 one of the comments, or a lot of the comments that we
25 got from the public was what about an accident where

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1 you bypass the impact limiters.

2 And the perfect example is what we call a
3 backbreaker test, and as Andy mentioned earlier, you
4 could visualize that as a bridge above it perhaps,
5 with the cask traveling transversely, and hitting this
6 big bridge abutment, and the impact numbers really
7 don't come into play on that.

8 And so that is why we are recommending
9 this particular orientation for the truck cask, and we
10 think that it really will give us some added
11 information in the performance of these types of
12 casks.

13 And you can see here again the
14 acceleration plot versus time, and you get a pretty
15 high acceleration of 150 G's max, and then an average
16 acceleration of about 100 G's on that particular cask.

17 And in this analysis, we did not include
18 the impact numbers, although the mass impact numbers
19 are included in the cask, and so we have an accurate
20 simulation of the mass while dropping it as that
21 particular speed.

22 Again, we used 75 miles per hour as the
23 proposed cask speed for the impact on that cask. This
24 is some analyses for the fire test, and this is the
25 Holtec Hi Star cask here, and the three analyses shown

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1 here on the left, this is one meter above the pool
2 fire, and this is an analysis with the cask on the
3 ground, which is pretty probable if you were to have
4 an accident and followed by a subsequent fire.

5 And then this is with the cask 3 meters
6 above the pool fire, and that probably from a
7 realistic standpoint is not highly probable, but we
8 have been looking at the environment, and how the cask
9 responds to particular environments.

10 The thing that we are looking at here is
11 what is called a vapor dome, and this is the
12 relatively dark area underneath the cask, where you do
13 not get complete combustion of the fuel.

14 There is not enough oxygen to combust all
15 that fuel mixture, and so you have relatively cool air
16 underneath that cask where that vapor dome is. So at
17 3 meters, we were looking for what would happen if we
18 got the cask above the vapor dome and see how that
19 affected the surface temperatures of the cask.

20 This particular picture is shown at one
21 meter by the pool, and you see a relatively cool area
22 underneath the cask where that vapor dome is, and then
23 higher temperatures on the top surface.

24 This is a graph of the surface temperature
25 at different locations on the cask as a function of

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1 time. And for these analyses, we took them out to one
2 hour, 60 minutes for these particular analyses.

3 And again there has been no decision made
4 in terms of how long to do these fire tests, or at
5 least the orientation of the fire tests and those
6 sorts of things. As Andy said earlier, at this point
7 the proposal is to make it longer than 30 minutes.

8 And then just to wrap it up and tell you
9 about some of the technical reviews that we have had
10 on the protocols to get us to this point, and we have
11 had a fair amount of reviews internally, and by
12 external technical people as well, to get their
13 feedback and comments.

14 And we first introduced the protocol type
15 process and the package performance study at PATRAM
16 '01, and PATRAM is an international transportation
17 conference that is held every three years, both
18 internationally and in the United States, and it
19 happened to be in Chicago.

20 Rob Lewis from the NRC gave a plenary on
21 the package performance and what the NRC plans were
22 for this particular program. In April of last year,
23 about a year ago, we had two expert review panels
24 review the draft protocols at Sandia.

25 And one was a structural panel, and one

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1 was a structural panel, and the other was a thermal
2 panel, and we had people from industry, and people
3 from academia, review the technical aspects of the
4 protocols, and we got their comments back from them
5 and incorporated them into what you see today as
6 appropriate.

7 In June of 2002, we also made a
8 presentation to the Advisory Committee on Nuclear
9 Waste, and then in June again of 2002 we also made a
10 presentation to the National Academy of Sciences. So
11 that concludes my talk, and thank you for your time.

12 FACILITATOR CAMERON: Okay. Thanks a lot,
13 Ken. Let's go to Bob Halstead for our first question
14 on the presentations. Bob.

15 MR. HALSTEAD: Well, I have a statement on
16 the matter of transportation and risk reexamination as
17 it is presented in the document known as NUREG CR
18 6672, and I will have a question at the end, Chip.
19 Now, most people in this room are not familiar with
20 this report.

21 It is a very important report, because it
22 is the foundation study, and so pretty much everything
23 that we are talking about in the package performance
24 study.

25 For those of you who have not read it, it

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1 may surprise you to find that the NRC study written by
2 Sandia concluded that the risks of transportation of
3 spent nuclear fuel were basically one-third of the
4 risks identified in previous NRC studies.

5 And we reject that conclusion, and we
6 reject the process that was used to prepare that
7 report, and we believe that the NRC is misusing this
8 report. We know for a fact that the Department of
9 Energy is misusing this report.

10 And please bear with me while I go through
11 six points of analysis, because it is very important
12 that we not only understand the technical deficiencies
13 in this risk assessment report, but that we understand
14 how important it is that the NRC not repeat the
15 defective public participation process that precluded
16 the State of Nevada and other stakeholders for having
17 a say and perhaps preventing that report from making
18 the mistakes it makes.

19 First of all, the draft and final reports
20 were prepared at Sandia National Labs under a veil of
21 secrecy. The State of Nevada on at least three
22 occasions requested the opportunity to review the
23 draft report, and we were rejected.

24 Secondly, the NRC staff, when asked about
25 the report in public meetings around the country --

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1 and, Bill, I personally had this exchange with Corbin
2 Harney, now retired, but to many people in the
3 business known as one of the most respected NRC staff
4 people in this area, simply said that he was not
5 allowed to talk about the report.

6 The third point is that the NRC refused to
7 issue this very important report as a draft report for
8 formal review and comment.

9 The fourth point is that neither the NRC
10 nor Sandia National Labs have responded to the more
11 than 25 pages of detailed technical criticism provided
12 by the State of Nevada and Clark County.

13 And point five is that we are very
14 specifically concerned that neither the NRC nor Sandia
15 responded to the list of 21 very severe historical
16 highway and railway accidents which we believed
17 created forces that exceed the cask performance
18 standards, those standards that are supposed to
19 protect public health and safety that are in the NRC
20 regulations.

21 And point number six is that we believe
22 that the NRC staff and Sandia, in their use of the
23 risk examination report, generally and specifically in
24 this proceeding appeared to be using NUREG CR 6672 as
25 if it had formally supplanted the previous legal basis

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1 for risk assessments and environmental impact
2 assessments, and we believe that directly contradicts
3 the policy statement made by Chair Meserve in a letter
4 to my boss, Bob Lutz, dated January 2nd, 2001.

5 I won't belabor you by reading the letter,
6 but I will have it placed in the record and put on the
7 website. The bottom line here is that these risk
8 estimates are so low that they undermine my confidence
9 as an analyst, and the confidence of many other
10 stakeholders in the process.

11 And ironically the NRC's own advisory
12 committee on nuclear waste, as I read the transcript
13 of their June 28th, 2002 meeting, came to the
14 conclusion that, wow, if the risk are this low, why in
15 the world are we talking about spending millions of
16 dollars testing these casks.

17 Unfortunately the risks are not that low,
18 but unfortunately the Department of Energy has already
19 adopted this report, in contradiction to the policy
20 established by Chairman Meserve as if it were a final
21 revision for the basis of this assessment.

22 Today we are putting the NRC on notice
23 that we will hold you accountable to the policy
24 position taken by the Chairman when the NRC presents
25 its license application.

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1 And if they continue to use NUREG CR 6672,
2 you will have to defend the credibility of this entire
3 program. The way that we read it, NUREG CR 6672 is at
4 best a working document or a working hypothesis which
5 you intend to pursue through the package performance
6 study full-scale testing.

7 But this report is being misused by the
8 NRC and DOE and it undermines any basis of public
9 confidence in the risk assessments that are being made
10 by the Nuclear Regulatory Commission. Thank you.

11 FACILITATOR CAMERON: Okay. And I would
12 just -- and this is very important obviously for the
13 NRC here, and what I would like to do though is to try
14 to see if there are any questions out here and -- and
15 I will get back to that, but I just wanted to remind
16 people that this part is about questions, and then we
17 get to the next discussion segment, we want to hear
18 all of the statements, like Bob's.

19 And I guess when we do get there, I would
20 like the NRC to perhaps talk about the relationship --
21 Bob raised a lot of points about that report that go
22 to the report, but there is also some generic lessons
23 perhaps, and that's how we started out, but the most
24 important thing is how does that report drive if it
25 does at all the draft test protocol. Now, Jim,

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1 question?

2 MR. CHANNELL: Yes. I had a question on
3 a clarification. In reading the background material,
4 it was not completely clear to me whether the fire
5 test was going to be with tasks that had been subject
6 to the 75 mile per hour impact tests first or not.

7 Sandia made some arguments about the
8 problems of perhaps doing these fire tests with a
9 damaged cask, and so I just wanted to clarify or ask
10 the question of what the current proposal is.

11 FACILITATOR CAMERON: Go ahead, Andy.

12 DR. MURPHY: The current proposal is that
13 it will be a sequential test. We will take the cask
14 that was used for the impact test, and put it in the
15 fire test. It will be impact, followed by fire, with
16 the same task.

17 MR. CHANNELL: If you lose containment in
18 the impact test, you won't be able to test what the
19 fire test had on containment.

20 DR. MURPHY: Yes, we are aware that there
21 are numerous technical issues that will have to be
22 addressed in making any final decisions on how these
23 tests will be carried out, but right now specifically
24 the staff proposal is to do the impact test, followed
25 by the fire test.

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1 MR. CHANNELL: All right.

2 FACILITATOR CAMERON: Let's go to Judy,
3 and then Cash, and then I think we will go to Bill.
4 Judy.

5 MS. TREICHEL: First, I want to make the
6 statement that twice it was mentioned that this is
7 talking about transportation to a repository, and then
8 specifically to Yucca Mountain. The task force will
9 not cooperate and/or participate in anything that is
10 cooperation of getting waste to Yucca Mountain.

11 We absolutely oppose that, and the reason
12 that I am here and possibly others at the table is
13 because we believe that there needs to be safe
14 transportation of spent fuel and high level waste for
15 safety reasons.

16 And I think there are going to be
17 occasions when that stuff needs to be moved, and I
18 think the casks should be capable of doing that, and
19 I think the public should have confidence that DOE or
20 whoever it is, a utility or whatever, it able to use
21 a certified cask certified by the NRC that is safe.

22 That is the reason that I am here, and
23 that is why I am participating in not any way to
24 further or give the public confidence that Yucca
25 Mountain is a good idea, and I want that on the record

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1 first.

2 FACILITATOR CAMERON: All right.

3 MS. TREICHEL: When you showed one of the
4 slides, and I think it was in the second presentation,
5 you showed an MPC inside the shipping container. Is
6 that to be the situation with any of the tests, and
7 will it be done without the MPC inside?

8 DR. MURPHY: We are proposing two impact
9 tests; one with the GA-4, which does not have an MPC
10 associated with it, and the Holtec, which does. We
11 are testing the units as they are to be used in a
12 certified campaign.

13 And part of the reasoning here is that we
14 are attempting to challenge the capabilities of the
15 codes and we wanted to see how well they would perform
16 with an impact limiter, or excuse me, with a
17 multipurpose canister and without, and it was a good
18 observation that the Holtec does have the multipurpose
19 canister associated with it, and it will be tested
20 that way.

21 FACILITATOR CAMERON: Thank you. Bill,
22 did you want to say something before we go to the rest
23 of the questions, or --

24 MR. BRACH: Yes, I do. I want to preface
25 my comments first, because I don't want this to sound

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1 or come across as a point/counter-point type of
2 discussion or interaction.

3 But a few of the comments that Bob had
4 mentioned I do believe warrant some comment or
5 response. First, NUREG CR 6672, I briefly mentioned
6 it, and both Ken and Andy made reference to it in
7 their discussions as well.

8 That was a report that the NRC issued in
9 March of 2000. It was a report as Ken has mentioned
10 that we had a contract with Sandia National
11 Laboratories to conduct and prepare, and it was not a
12 report, and in the process it was not an activity that
13 we have as a public participatory process that we have
14 today.

15 You might recall one of the slides -- and
16 that is an active public participatory process, and it
17 fairly contrasts our generation of the contract report
18 that was an NRC and Sandia activity to the activity
19 that we are carrying out today, and that report was an
20 NRC-sponsored study issued as a contractor report, and
21 it did not have -- and it was not planned to be issued
22 for public review and comment.

23 Bob also mentioned that there were a
24 number of comments that both the State of Nevada, as
25 well as a number of other folks, that were raised to

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1 us on the NUREG 6672.

2 I would offer and recall to some of the
3 folks that are here that when we issued the issues
4 report on the package performance study in June of
5 2000, we at that same time actively asked for public
6 review and comment on 6672 as part of that second
7 series of public meetings that we had on the package
8 performance study.

9 And we did get from a number of
10 stakeholders, some that are here today, and some in
11 other arenas, comments on that report, and those
12 reports are listening to those comments and factoring
13 into, and considering in our plans for the package
14 performance study for the types of tests that should
15 be carried out.

16 And as Ken had mentioned, part of the risk
17 analyses that we carry out with the information that
18 we have gained from the package performance study. So
19 I just wanted to clarify those points, and the last
20 point that I would make reference to is that in my
21 discussions as well, I know that the NRC has conducted
22 three transportation studies in the last 25 years.

23 I didn't identify those specifically, but
24 the very first one was the environmental impact
25 statement that the NRC, actually in cooperation with

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1 the Department of Transportation, predated back in the
2 1970s.

3 That EIS formed the basis and continues to
4 form the basis for our regulations in 10 CFR Part 71
5 for transportation. Subsequent studies, the mobile
6 study in reference to the NUREG 6672 study, those were
7 not supplants for, and did not take the place of the
8 EIS, and it was merely based on NRC's and our
9 contractor's review and analysis, and continued to
10 provide to us information that supports the continued
11 validity of the environmental impact statement we
12 issued back in -- I believe it was 1977. Thank you.

13 FACILITATOR CAMERON: Okay.

14 MR. HALSTEAD: Chip, can I make just a
15 quick response and I won't tie this up. I appreciate
16 that clarification, Bill, and you have gotten right to
17 the point that is important to us. I am not sure that
18 it injures the State of Nevada that there is a report
19 out there that we feel is wrong and with the deficient
20 public process in and of itself.

21 It injured because the Department of
22 Energy and other entities are using this report as if
23 it were a final report, and again you may not have
24 even seen the Chairman's letter.

25 You might have written it, but I noticed

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1 that with many letters that there is no carbon copy
2 list on this. And what the Chairman said is that as
3 you said, NUREG 0170 and Table 4 in the regulation
4 continue to be the NRC's basis for this assessment.

5 The problem is that when the NRC puts its
6 name on a contractor report that it is such a powerful
7 endorsement that people pick that report up and cite
8 it as if it were gospel and validated by full-scale
9 testing, which it is not.

10 I personally had to take a statement from
11 a Department of Energy contractor at the waste
12 management conference in Tucson last week, and that
13 some people were there and witnessed, in which this
14 document was cited as the definitive statement on
15 risk.

16 And furthermore the Department of Energy
17 used this in their final EIS, which was delivered on
18 Valentine's Day last year. So contrary to the
19 Chairman's view, there never was an opportunity for
20 the public to challenge the way DOE used this.

21 So I want to proceed with this study, but
22 I want to make it clear right now that the foundation
23 document of this study has been challenged by many
24 people on detailed technical grounds, and I appreciate
25 the fact that you seemed to have learned that this was

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1 a bad way to do public participation.

2 And I will say that the way that you are
3 conducting this meeting, this process is the way that
4 you should do it. Nonetheless, we believe it has
5 injured the State of Nevada and its residents that
6 this report is out, and it can be misused by any
7 number of parties, including the Department of Energy,
8 and FDIS, that will probably be submitted to you as
9 part of a licensing package.

10 FACILITATOR CAMERON: Okay. Let's try to
11 keep this on the relationship to the test protocol and
12 forward moving. And I think that Bob has made a
13 couple of relationships there, but when we get to the
14 next discussion period, maybe the specific information
15 that people would want to know from the NRC is how
16 does this NUREG influence the draft test protocols,
17 and I don't want to get into that now.

18 But I think that is the type of
19 information that we need to get at. Let's go to
20 Diane, and then Cash, and then to Bonnie. Diane.

21 MS. NIELSON: Thank you. I am going to
22 make an assumption here, and if I am incorrect, that
23 may answer the question. We are talking about testing
24 these new casks, and I appreciate that we are talking
25 about sequential testing.

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1 But I am not hearing anything about
2 testing of used casks. When the State of Utah
3 reviewed the proposal for PPS, for present fuel
4 storages proposed facility, their intent is to reuse
5 those transportation casks.

6 And if that is in fact the way that the
7 operations will ultimately be approved, then I would
8 like to understand what the NRC's plan is for a
9 testing regimen for used casks, and their components,
10 and particularly the components that are likely to be
11 stressed through use such as the bolts.

12 FACILITATOR CAMERON: Great question.
13 Andy, Ken, Bill? Bill Brach.

14 MR. BRACH: Well, first to clarify, your
15 understanding is correct. The tests that we have
16 described today would be tests of newly fabricated
17 packages, and again the question as Andy had said was
18 that the draft proposal would be a Holtec rail task
19 and a GA for truck cask.

20 Now, going directly to the questions that
21 you have raised with regard to testing of used casks,
22 I want to stress that the package performance study,
23 and I tried to identify this from the opening
24 comments. the purpose of the study is not to determine
25 or validate if you will the adequacy of the current

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1 Reg rules and regulations.

2 We are very comfortable based on the
3 current rules, and regulations, and standards on the
4 current use of spent fuel packages. And that includes
5 if you will the reuse.

6 A certificate for a transportation package
7 is issued for a 5 year period, and at that time the
8 certificate holder is required to come in to request
9 a renewal or to request modifications of that package
10 design.

11 And that goes through again another NRC
12 review of that certificate. And that would include as
13 well if there are any conditions of use that would
14 raise a question with regard to the continuing ability
15 of that package design to meet its form, fit, and
16 function with regard to materials, and use would be a
17 question that would be looked at with regard to any
18 questions that might be outstanding with regard to the
19 continued use of a cask that has been used in multiple
20 events or multiple occasions.

21 FACILITATOR CAMERON: Diane, does that
22 answer your question, or do you have a follow-up to
23 that?

24 MS. NIELSON: I appreciate the process.
25 I guess with that response, my request would be that

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1 you consider full-scale testing of a used cask, or
2 that you consider establishing along with this
3 protocol a protocol that would include a scheduling of
4 review and examination of casks.

5 And not just an assumption that if the
6 cask passes the test initially that it will be able to
7 sustain that performance for the five years, or
8 whatever it is estimated to be in use.

9 FACILITATOR CAMERON: And as a preview for
10 our overarching issues discussion, from what I am
11 hearing Diane say, is that if we have a realism
12 objective for the test protocols, it is because that
13 these casks -- that it would be more realistic to test
14 used casks. Okay. We will go to Cash and then to
15 Bonnie.

16 MR. JSASCZAK: Well, the discussions have
17 yielded a certain amount from where it was when the
18 question was prompted and it went to where Jim and
19 Andy were talking. The first one was did their
20 computer testing and their modeling, and then the
21 full-scale test as part of this protocol, and that is
22 basically one question.

23 The second then is if whether these are
24 new or used casks, and I assume that there is a
25 quality assurance program in place to address that

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1 point, because it doesn't make sense on anything that
2 you do over a period of time to test it once and
3 forget about it.

4 That you have some sort of a assurance
5 program that there is rigidity, continuity, and
6 integrity to this process, and that it is just the
7 once and forget it.

8 I don't believe that is where you are
9 going, and so in terms of the casks themselves, how do
10 you get to the temperature, the internal temperature
11 of the cask, whether it is the bent cask, the dropped
12 cask, the fire, and when they are all put together,
13 how do you do that, and how do you have assurances in
14 the process that you have not destroyed your measuring
15 process, if there is one inside.

16 And then the third question is that the
17 calculations of the 75 miles per hour, and from a Nye
18 County perspective, not as the most affected county in
19 the State, and not whether this is going forward or
20 not, and we are making an assumption that it is, and
21 we have to react that way, we want you to be as
22 successful as possible so our safety and surety of
23 this program is in place.

24 And we want that moral high ground,
25 regardless of where the State goes on this issue, or

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1 where this whole program ends up, we want this to be
2 a good protocol and a good test.

3 Therefore, we really want to have the
4 input focused on that part of it, as opposed to the
5 who shot John.

6 FACILITATOR CAMERON: Okay. Did you
7 capture the three -- there are three questions.

8 DR. MURPHY: I think we got the three, and
9 I will answer I believe the first two, and that is that
10 first associated with predictions, we will be carrying
11 or having our contractor, Sandia, carry out predictive
12 analysis of what we expect to happen to the casks in
13 the tests that are proposed, the tests that are
14 carried out.

15 Those predictions and those analysis will
16 be publicly available before the test happen, and it
17 is our intent at this stage that it is the easiest to
18 think about the impact test, that we will be having a
19 tutorial for the public before we carry out the tests
20 to explain what is happening and what to expect.

21 And then we will carry out the tests and
22 if everything goes well, the folks will be able to
23 approach the casks. If we had predicted a four inch
24 dent in the cask associated with the drop, folks will
25 be able to approach the cask and indeed see that there

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1 is a four inch dent.

2 Part of the prediction process will be a
3 condition of the success for that prediction. We have
4 not decided on what those will be. Let's say we are
5 talking about a 4 inch dent, we will tell you that a
6 3 inch dent, or a 5 inch dent represents the range of
7 uncertainty in our calculations.

8 The other question that you were asking
9 about is QA. There will be very definitely a QA
10 program associated with the work that the contractor
11 is doing, and the calculations that they are making,
12 and the whole process there.

13 There will also be QA programs associated
14 with the manufacturer of the casks, and there is a QA
15 program required for the purchaser of the cask so that
16 we believe that you will be fairly well covered on the
17 double-check that the process is assured, and that
18 there can be confidence in that process.

19 And I will ask Ken to address some of the
20 thermal points that you were making.

21 MR. SORENSON: Right now there are no
22 plans to internally heat the casks during the tests,
23 and some of the objectives are to be able to predict
24 cask response to particular environments, and we want
25 to demonstrate that we can do that with what has been

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1 proposed.

2 And adding an internal heat source is a
3 relatively easy thing to do analytically, and we don't
4 see that as really adding to the value of the
5 technical part of this program.

6 MR. JSASCZAK: On one follow-up, how about
7 the puncture tests that you are testing that is
8 currently I believe not included in this process?

9 DR. MURPHY: That's correct. A puncture
10 test is not currently included in the process. If you
11 are making the comment that we should consider that,
12 that will be for someone else, as someone has already
13 made that one.

14 So, yes, it is beyond our agenda to
15 address whether we should be doing a puncture test as
16 well as the impact tests.

17 MR. JSASCZAK: So I head you say that has
18 already been brought up in one of your other meetings,
19 and so that is one of the things that is already part
20 of the consideration process as you move forward?

21 DR. MURPHY: That is correct. That is a
22 comment that we received, and we would be pleased to
23 get a second comment to that effect if you would be
24 kind enough to make it. We will have formal written
25 remarks that will be done before the end that include

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1 virtually all of these.

2 FACILITATOR CAMERON: Okay. Let's go to
3 Bonnie, and then to Mike, and then we will go across
4 to Judy. Bonnie.

5 MS. BOBB: First of all, concerning the
6 time of testing. I noticed that you put down half-an-
7 hour. I just want to say that our reservation is
8 located about 12 miles from one of the rail sites, or
9 a little further than that, and I drove from there and
10 it took me 6 hours to get here.

11 And you are proposing a thermal test of a
12 half-an-hour, and I wondered about the rationale
13 behind that. The other thing that I wanted to know is
14 if you are talking about an unyielding surface,
15 because any other surface (inaudible).

16 What is an unyielding surface, and isn't
17 there a great difference between an artificial
18 unyielding surface and the earth, because there would
19 be a whole lot of damage to the water and the
20 environment of the Yomba Shoshone Tribe, and the
21 environment in that area; animal, people, plants,
22 water, air, in a very large area.

23 And the question that came up in the midst
24 of this is who are all of your consultants? Is it
25 only Sandia, or are there others?

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1 And the fourth kind of thing is kind of a
2 comment on what you are saying about the predicted
3 models. I think (inaudible) outside the known points.
4 If I have a predictive model, my degree of certainty
5 of what I am estimating in the future can only be
6 certain within a range of the known.

7 I can be more certain within the range of
8 the known, and you are (inaudible) very artificial
9 situations. So how do you make predictions outside
10 the range of the known, because we all know that the
11 error increases, and what degree of error is expected?

12 FACILITATOR CAMERON: Okay. Four
13 questions, and the last one is how are we dealing with
14 uncertainty in the use of models. The first one was
15 the thermal test, and the six hour drive. Ken, do you
16 want to answer that, or Andy, or how do you want to
17 answer the questions? Go ahead, Andy, if you have the
18 answer.

19 DR. MURPHY: Let me start with the
20 answers, and we will get some backup from Ken. The
21 first one associated with the duration of the fire
22 test. If you remember, and you probably were not able
23 to see them, but the graph that Ken showed about the
24 heat up of various points within the cask as time went
25 on as the fire burned, we are interested to be able to

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1 validate our code and model so that we are able to
2 predict at the various points within the cask and
3 outside the cask what the temperature rise will be.

4 What are the trends in the rates of
5 temperature rise, and if we are able to do that, we
6 would anticipate that carrying out a six hour fire
7 test, if that were the appropriate thing, we would be
8 able to predict what happens with the temperature at
9 those various points as time proceeded.

10 We have suggested at this stage just
11 simply going beyond the certification test of a half-
12 an-hour, and are looking specifically for comment on
13 how long the test should be.

14 FACILITATOR CAMERON: The next one would
15 be unyielding surface.

16 DR. MURPHY: The next one is associated
17 with the unyielding surface, and your concern I
18 believe was that if we are talking about the real
19 world, you were concerned that in the real world that
20 a collision might occur on a yielding surface, such as
21 a granite face or a layer of limestone.

22 And that we would not be on the
23 conservative side, and what happens with the
24 unyielding surface is that all of the energy generated
25 in the accident, i.e., falling from the tower, would

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1 be transferred to the cask. So that would be the most
2 severe challenge to the cask.

3 If we dropped it on a limestone layer, or
4 we dropped it into a sandy soil, that would cause less
5 damage to the cask. So in that situation you are less
6 likely to have the cask lose containment than you
7 would on the unyielding surface. So the unyielding
8 surface is the more severe challenge to the cask.

9 MS. BOBB: But what would that finding be
10 --

11 DR. MURPHY: On the unyielding surface?
12 It would consist of a block of concrete, reinforced
13 concrete, 30 to 40 feet wide, with the same depth, and
14 a steel reinforcement on top of it. So that you are
15 talking about a package that is nominally 10 times the
16 weight of the object that is being dropped on.

17 FACILITATOR CAMERON: And the third
18 question has to do with consultants, additional
19 consultants; is that correct, Bonnie?

20 MS. BOBB: Consultants other than Sandia
21 and are there any independent consultants other than
22 Sandia.

23 FACILITATOR CAMERON: And by independent,
24 you mean -- how are you using the term independent?
25 Just so they can answer the question.

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1 DR. MURPHY: Well, I don't think
2 independent at this stage makes a difference in the
3 answer, in that the consultants that we are using that
4 had worked with us in the peer review that Ken
5 mentioned, are listed in Appendix B of the test
6 protocol report. They are there.

7 And I would ask you to repeat your
8 question about the predictability of modeling so that
9 I can provide an answer to you.

10 MS. BOBB: If I am going to make a model,
11 I am going to build in factors in error, and I am
12 going to make like kind of a regression (inaudible).
13 If I have various data points that I can enter within
14 certain ranges, and I have an unknown, and if it falls
15 within the range of those known data points, I can
16 make a fairly accurate estimate with a certain known
17 degree of error.

18 If I am estimating outside the range of
19 the known data points, my error is going to increase,
20 and it seems like a lot of these tests are based on
21 factors outside the range of the known data points.

22 DR. MURPHY: Okay. I understand what you
23 are interested in, and I agree with you considerably,
24 in that in my seismological work the prediction of
25 ground motion at a site uses exactly the same process.

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1 The process is very similar for a
2 structural analysis. You are going from models that
3 have been validated and proven to work very
4 significantly for elastic collisions. These are
5 collisions that the objects bend during the impact,
6 and then after the impact is over and the forces are
7 taken away, they return to their initial state.

8 Here we are interested in looking at
9 plastic deformation. This is deformation that remains
10 after the collision occurs. This is an area of more
11 uncertainty than the elastic. We are talking about
12 Sandia conducting analysis to predict what is going to
13 be happening with these casks in plastic collisions.

14 The challenge would be to come up with the
15 accurate estimates of what is going to happen. As I
16 mentioned, we will get an estimate of what is going to
17 be happening based upon the analysis that is done, and
18 it is our intent to say, okay, this is our prediction
19 of what is going to be deformed, and how much it is
20 going to be deformed.

21 We will also do an analysis and say, okay,
22 now well do we know the material properties, and how
23 much uncertainty is associated with them, and that
24 would give us an estimate of the uncertainty bands
25 that we will publish as well.

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1 As I have mentioned as a very simple
2 example, that if the prediction is for a four inch
3 dent, whatever that means, we will give an uncertainty
4 band on that of say 3 to 5 inches. The dent would be
5 in that range.

6 And that will be our prediction and that
7 is what will be available before the test occurs.

8 MS. BOBB: Thank you.

9 FACILITATOR CAMERON: Okay. Let's go to
10 Mike and Judy, and then I think we should go around
11 and hear statements of participant interests. Mike,
12 go ahead.

13 MR. BAUGHMAN: Thank you, Chip. I just
14 have three quick related questions. The first would
15 be what is the NRC's hypothesis regarding the outcome
16 of the objective or the activity to obtain data to
17 refine risk estimates, and would you anticipate the
18 results of that leading to a reduction in risk
19 estimates, or no change in risk estimates, or an
20 increase?

21 DR. MURPHY: I think that would be
22 premature at this stage to predict what the outcomes
23 will be, and then what impact that may have on the
24 regulations.

25 We are in a position that we are open to

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1 an understanding of what is going to happen. Let's
2 say in a worse case scenario if it goes badly that the
3 predictions are that the deformation is more than
4 expected, and that has an impact upon the
5 certification tests, we will obviously as an agency
6 have to reexamine the certification process.

7 I will say that by the comments that it is
8 appropriate to say that by comments and by our
9 experience with the safety that we have seen in the
10 casks so far, we don't believe that there will be that
11 kind of a scenario.

12 MR. BAUGHMAN: Okay. In all the research
13 there is a hypothesis going in, and this one sounds a
14 little unclear, but your last part of the response I
15 think was an avail (phonetic) hypothesis.

16 I guess the second one would be is what is
17 the estimated cost of the PPS, including costs
18 incurred to date through completion?

19 DR. MURPHY: I could give you some
20 estimates on particular items, but at this stage, we
21 are trying to focus on the technical merits first, and
22 that is the way that we do our procurements, is that
23 we want to get the technical merits down, and we want
24 to get the best technical programs to start with.

25 And then we will address the costs that

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1 are involved. I think it is fair to say that Bob
2 Halstead, at the meeting in Washington, suggested that
3 the costs of the upgrades for the facilities at Sandia
4 were between something and another and \$8 million.

5 And I told him that, yes, that he was in
6 the right ball park with those figures. I would not
7 like to at this moment give you a further estimate
8 because that might be interpreted as locking us into
9 a particular test sequence, and we would like that to
10 stay open and very much like to have comment on that.

11 MR. BAUGHMAN: So the NRC at this point
12 has no estimate of the costs of the PPS as outlined in
13 the document then?

14 DR. MURPHY: Yes, we do have an estimate,
15 and our estimate at this stage would indicate that to
16 do the testing as we propose would be more than \$20
17 million.

18 FACILITATOR CAMERON: Okay.

19 MR. BAUGHMAN: The third question, Chip,
20 is related to the first I guess. I am not real clear
21 exactly what the NRC legal mandate is, and I did not
22 have a chance to check it out before I came, but I
23 assume in a nutshell that it is to protect the public
24 health and safety.

25 And I guess I am wondering what the link

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1 is between protecting public health and safety and
2 instilling public confidence. I don't know whether
3 there is a causal link there if you will between those
4 two, and I am kind of curious about that.

5 So let me just note -- and again getting
6 back to the hypothesis, one of the objectives in the
7 missions of this work is to instill public confidence.

8 I am wondering or I am assuming that your
9 hypothesis in this case is that the work would lead to
10 some enhancement of public confidence, and I for one
11 have been one who when we had the previous hearings or
12 meetings on the reexamination of risks, and we were
13 heading down this path, I was critical of physical
14 cask testing, and I think I remain critical to
15 physical cask testing from the perspective of leading
16 to public confidence.

17 And to illustrate, we have twice now
18 brought up the example of the uncertainty associated
19 with the four inch dent, and we are going to have
20 perhaps a range here that we are going to use that is
21 3 or 5, and I understand that this is purely exemplary
22 that you threw this out.

23 But I think it exemplifies the problem
24 that we are going to face, and that is a 25 percent
25 range variation and deviation on either side, in terms

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1 of the four inch, and we are looking at 3 to 5, and
2 you have got 25 percent on either side.

3 And I can assure you that the folks around
4 this table that would be inclined to exercise
5 cogitative dissonance and will focus on the 25 percent
6 range, and what ultimately is 50 percent range of
7 uncertainty in those estimates.

8 And that will have a dramatic effect of
9 undermining any public confidence in this. So I just
10 raise the question of what is the NRC's mission, and
11 it is to protect public health and safety, and what is
12 the link between instilling public confidence and
13 garnering public health and safety.

14 I am not sure that these activity is
15 something that is better vested with the cask
16 manufacturers, the Department of Energy, transport
17 companies. That's all I have to say.

18 FACILITATOR CAMERON: That is a lot of
19 interesting food for thought there with respect to
20 someone's overarching issues, but I think you might
21 want to address some of the question now, Bill.

22 MR. BRACH: If I can. Your first
23 reference to the mission of the agency is correct.
24 Our primary mission is to protect public health and
25 safety, and common defense and security, and the

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1 environment. And that is a legislative mandate to the
2 NRC and that is our primary mission.

3 Your question relating to how is our
4 meeting today, and how is our consideration of doing
5 or carrying out the package performance study, the
6 full scale testing of the cask related to our mission,
7 and gaining if you will public confidence, go back to
8 some of the earlier discussions.

9 And in some of the previous studies that
10 the NRC has carried out, and comments that we have
11 received with regard to if you will the NRC's lack or
12 previous lack of involving the public in commenting on
13 the process, and having input what we are doing, and
14 how we are doing it, and how the results were
15 analyzed, and from those results how we drew
16 conclusions.

17 And I mentioned the package performance
18 study, and what we are walking through right now, and
19 we are trying to play a more active role with regard
20 to engaging stakeholders, and a broad spectrum of
21 stakeholders, whether it be State or local
22 governments, Native American Indian organizations, or
23 industry, and others, with regard to input to us.

24 And as to what types of tests, and what
25 types of considerations should we consider in the

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1 tests. Our effort here, and clearly we have a
2 technical objective, and that Ken and Andy have
3 mentioned in earlier presentations, clearly of
4 interest on our part is to gain and increase public
5 confidence in what we are doing.

6 As was mentioned earlier, hopefully
7 through an improved understanding of the tests we are
8 planning, and through the various test parameters, and
9 why those parameters would be selected, and how we are
10 going to evaluate them, and have as much as we can an
11 open and public process.

12 And as Andy has mentioned, to predict if
13 in an impact test there will be an impact on the
14 canister of some dimension. And I understand your
15 comment with regard to the uncertainty and concerns
16 that might come with understanding fully that
17 uncertainty range.

18 The effort on our part in engaging the
19 public is to have a broader understanding, and not
20 just the technical community within the NRC, and maybe
21 the industry with regard to a technical basis for what
22 we do, but a broader, and hopefully a broader
23 understanding with our stakeholders, and a broader
24 public participation and more general awareness of
25 what we are doing and why we are doing it.

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1 I mentioned this as a learning process,
2 and one of the comments that I made earlier, too, was
3 that this package performance study is our first
4 effort on a major research project such as this to
5 engage the public in our planning, and in our scoping,
6 and helping us develop a test plan to be carried out.

7 And it is a learning process and we are
8 looking for public input and we are hopeful that
9 through that understanding that public confidence in
10 what we are doing, and why we are doing it, and how
11 the results are analyzed, and how we draw conclusions
12 from those activities, will give the public a broader
13 understanding.

14 And hopefully increase the confidence in
15 the conclusions that we reach with regard to going
16 back to our mission statement and as far as the
17 actions that we are carrying out to ensure public
18 health and safety. I am asking for your help in our
19 achieving that overall objective.

20 FACILITATOR CAMERON: And, Mike.

21 MR. BAUGHMAN: I guess I would just
22 suggest that I caution you about your expected outcome
23 with regard to public confidence, and I would
24 encourage perhaps some hypothesis testing on that
25 potential outcome. I just question that as being a

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1 focus if you will of the mission of this particular
2 activity.

3 FACILITATOR CAMERON: Okay. Thank you.
4 Let's go to Judy, and then we were going to go to the
5 next segment of the program. Judy.

6 MS. TREICHEL: I have three questions and
7 they would probably go faster if I just give them to
8 you quickly. The first one is a follow-up on the
9 first question that I asked, where you said that you
10 would be testing a rail cask with an MPC.

11 Is it required that you have an MPC and
12 could you test with one and then wind up using the
13 cask without an MPC inside of it?

14 The second one is in regards to the impact
15 limiters. That is a real descriptive term for what it
16 is, and I don't think that your tests should include
17 impact limiter, and I think it should include impact
18 maximizing situations so that you are really getting
19 a test of what it can do, because I am another one
20 that is in favor of test failure, because it seems to
21 me that if you test to a particular limit and it makes
22 it as far as I am concerned one degree past that
23 limit, it is failure.

24 So I think you should be as tough as you
25 can with those. The very last one is I also believe

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1 that you should be testing every design that would be
2 in use, and I back up Diane in the idea that you
3 should be going back to looking at used casks.

4 They may have surprises for you, and the
5 analogy I guess is that if you are just going to pick
6 out one, and you are going to have a whole lot of cask
7 designs, because there is a whole lot of vendors out
8 there, would be -- it would seem to me that it would
9 be like if I chose one of my children, and I gave them
10 an SAT test and then that should just sort of cover
11 the rest of them in college could take a look at that.
12 So those are the three.

13 FACILITATOR CAMERON: Can someone -- this
14 term impact limiter comes up a lot, and for those of
15 us who don't really know this field, can someone give
16 an explanation of what an impact limiter is, and I
17 think that Judy has some questions as well.

18 DR. MURPHY: I will try to answer your
19 questions, Judy. The first one about the rail cask
20 with the MPC in it. I believe that we had indicated
21 in earlier meetings that the NRC would be testing
22 these packages as certified, and I believe -- and I
23 will ask one of my colleagues here in SFPO to assure
24 me that it is correct, that the certification for the
25 Holtec Hi Star 100 includes the MPC.

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1 So that is the reason that that is there,
2 and so it is being testified as certified.

3 MS. TREICHEL: And you can't use it
4 without one in there.

5 MR. BRACH: It might be worthwhile
6 clarifying the reference to MPC, and one that is
7 another acronym, and that stands for multipurpose
8 canister, and in the discussion that we are having
9 today, the MPC only relates to a canister that could
10 be used in two different purposes, and that is for
11 spent fuel storage, and spent fuel transportation.

12 The Holtec Hi Star 100 cask design
13 includes the MPC, and the certification of that
14 transport package for use includes the transportation
15 overpack, and includes impact limiters in the
16 contained MPC. The MPC is that part of the transport
17 package that actually would be contained in this spent
18 fuel in transport.

19 DR. MURPHY: To answer your second
20 question about the impact limiters, what an impact
21 limiter is, is almost exactly what the word says. In
22 particular, in the Holtec design, they are using a
23 honeycomb aluminum material, and it has got a lot of
24 holes in it, and I will call it aluminum walls.

25 So that as it impacts and crashes into

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1 something, the impact limiter performs and absorbs
2 some of the energy so that less energy is then forced
3 into the canister, or excuse me, into the cask itself.

4 One of the subquestions that you have got
5 is the test to failure. Okay. At this stage, we are
6 not proposing test to failure. We are proposing it to
7 a particular classic deformation.

8 I am probably not going to be able to
9 change your mind, but I am going to try. What we are
10 driving at with the validation part of this test
11 procedure is to come up with an understanding that our
12 codes, and Sandia codes, can predict what happens to
13 the cask.

14 And we will carry out the tests as
15 proposed, and let's say it is 75 miles an hour, and
16 Sandia will have done an excellent job of predicting
17 what has happened, and we are all going to be happy
18 that they can predict behavior.

19 Well, in our minds, the prediction is that
20 they can tell you what is going to happen at 76, 77,
21 and take it pretty close to an understanding of what
22 is going to actually happen at whatever the failure
23 speed would be.

24 So we are validating these codes -- and
25 this is not going to make you happy -- so that we do

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1 not necessarily have to test every cask either to
2 failure, or in this extra regulatory sense, so that we
3 can take somebody else's cask, but maybe in the
4 process of design today, we can do an analysis of that
5 cask and over and beyond the certification regime, and
6 tell you what is going to happen that one when it gets
7 into this kind of situation as well.

8 So very definitely that is part of our
9 process and where we are going with it. The test
10 design is for every one, and I think I answered that
11 question, that we are not looking to test every one.
12 We are looking to have the certification process
13 carried out, and where we have issues associated with
14 how that cask will behave in the past certification
15 regime, we will be able to use a code to look at that.

16 I liked your analogy about the SATs,
17 because what we are doing is not doing an SAT for
18 every cask, but we are designing a test procedure to
19 look at it. So we are going one step further, and hat
20 we are looking at a testing procedure if you want in
21 the SAT analogy, rather than saying that we can tell
22 by testing one student how the second student is going
23 to behave.

24 And we are going to look at the testing
25 procedure that if you apply that test to all of the

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1 students that we can have a good idea. Not an exact
2 idea, and not a perfect idea, but an idea of how that
3 cask is going to do in the extra regulatory situation.

4 MS. TREICHEL: Okay. Well, you can
5 control your tests, but you are going to have to make
6 a deal with god to control the accident, and so that
7 is why we are talking about the test failure so that
8 you really know what you are into. Thanks.

9 FACILITATOR CAMERON: Okay. And, Bob, we
10 will pick you up on the way around. Let's give
11 everyone a chance to just give us a short exposition
12 of their interests or concerns on this, and let's
13 start with the State of Utah. Diane.

14 MS. NIELSON: Thank you. I appreciate the
15 comments, and this has been helpful in better
16 understanding the intent. I guess just a couple of
17 additional questions or comments to consider. If the
18 public is going to understand and have confidence in
19 what you are doing, they are going to have to
20 understand not just what you are doing, or in other
21 words what protocol you establish, but I think they
22 are also are going to have to understand why you
23 didn't do some of the other things that might have
24 been considered, and why you didn't take
25 recommendations, and why you didn't test every cask.

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1 So it isn't just answering a set of
2 questions or establishing a protocol for what you are
3 doing, but it is also providing an explanation of why
4 you are not doing some of those other things that
5 might create a greater constance.

6 It would also be helpful to understand how
7 you are going to draw conclusions from this protocol.
8 You are establishing a protocol for what you are
9 asking for input, and that means that we will
10 understand the testing procedures, and considerations.

11 But there is not too much in this document
12 right now as I see it about how you evaluate the
13 results. Is there an envelope of performance that is
14 acceptable and outside of that that would be
15 unacceptable?

16 Is it a fail or not fail? Is the ultimate
17 success that there isn't leakage? Those are some of
18 the considerations that I think need to be in the test
19 protocol, so that we understand the values of the
20 conclusions that you are drawing and so that the
21 public can understand them.

22 And then finally I think just a
23 recognition that this is a point in time that you are
24 looking at with a set of new casks, with a set of
25 testing protocols, and we will learn things if this

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1 process moves forward, and the program moves forward
2 for transportation.

3 And so not just urging that there be a
4 protocol and an evaluation of an envelope of
5 acceptance, or whatever in terms of how casks would be
6 tested through time, but also how you are going to
7 take that information and feed it back into the system
8 to make sure that your ongoing test protocol is really
9 addressing situations that we are going to deal with
10 through time in the transportation sector.

11 FACILITATOR CAMERON: Okay. Thank you,
12 Diane. Cash.

13 MR. JSASCZAK: Yes. One more time. Nye
14 County, as you are well aware, is where it all ends
15 up, assuming that is where the process ends up, and so
16 we would like to laud the process that you are going
17 through, in the sense that we want you to have the
18 best kept process that you can have in place, because
19 that is in our best interests.

20 We will wait to pass judgment on that, and
21 see how it turns out, and make those judgments, since
22 your mission obviously is to protect public health and
23 safety. Somewhere in this process, you are going to
24 have to make a risk benefit analysis of how far you go
25 on any one of these aspects.

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1 We understand that, and we accept that.
2 We want you to make the best and probably the most
3 conservative judgment that you can, knowing that each
4 one of those conservative judgments has a dollar sign
5 attached to it, and understanding that there are not
6 unlimited resources available, and at some point you
7 are going to have to make that judgment.

8 So we want you to make those best
9 judgments, and we want to hope that they will
10 withstand the scrutiny of both time and the
11 unpredictability of nature, as only god can answer
12 some of these questions, right?

13 FACILITATOR CAMERON: Okay. Thank you,
14 Cash. Let's go to Jim Channell.

15 MR. CHANNELL: I have had -- I am an
16 environmental engineer and a certified health
17 physicist, and I have been involved for as I mentioned
18 over 20 years with the transport of radioactive waste,
19 and including TRUPACT-1, which was (inaudible), and
20 the current TRUPACT-2, and also I have done a fair
21 amount of modeling on probablistic risk of accidents
22 and reviewed those by other people.

23 Because of the latter, I am really in
24 favor of the general thrust of these extra regulatory
25 tests because it will give us a couple of data points

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1 beyond which we don't have to use in refining our risk
2 studies.

3 We have all assumed over the years that
4 there would be releases at these more severe
5 accidents, but we have had no very good basis to go
6 on, on what these would be, and this should help.

7 The other place that I am coming from, the
8 TRUPACT-2 was certified in 1989 by the NRC, but it was
9 certified after extensive full-scale testing of the
10 hypothetical accident tests.

11 And multiple 30 foot drops, and multiple
12 puncture tests at different locations, and fire tests,
13 and actually as a result of these, there were a couple
14 of improvements made to the design of the TRUPACT in
15 the process.

16 I observed a large number of these tests,
17 and we interacted with the NRC and the contractor in
18 the interim on these tests, and out of this came a
19 great deal of confidence in myself and our
20 organization, and I think the technical community, and
21 I believe that a large number of the governmental
22 organizations around the west that are now receiving
23 hundreds of shipments a year in this package
24 (inaudible.)

25 What I am leading up to is a comment that

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1 I believe that all of these casks should be subject to
2 the hypothetical accident condition test; the 30 foot
3 drop, and the puncture test, and the fire test, and it
4 is my understanding that few if any of these tests
5 have been up to now, and I laud the recommendation
6 that the structure panel had that these tests should
7 first go through the hypothetical accident test, but
8 they seem to limit it only to the impact test.

9 And I am also -- I believe that probably
10 this would do more to gain confidence in the package
11 to be certified than some other things, is the fact
12 that if every one of them has to go through these
13 basic full-scale tests.

14 And the other thing coupled with that is
15 that I am a little bothered by a couple of references
16 and a couple of references that have been said here
17 this morning by NRC spokesmen that it is implied that
18 regardless of the outcome of these tests that we are
19 not going to revisit current certifications. And that
20 is enough for right now. Thank you.

21 FACILITATOR CAMERON: Let's clarify that
22 very important point is that a few minutes ago Andy
23 Murphy, I thought I heard you say that if these tests
24 show that we need to relook at the regulations or
25 certifications, that we would do so, and is that the

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1 concern that you expressed, Jim? Did I capture that
2 correctly?

3 MR. CHANNELL: Yes, that is basically
4 correct. I really already think that all of them
5 should have been anyway, but the second concern that
6 I had, yes. And it should really be looked at.

7 FACILITATOR CAMERON: Okay. When we get
8 to you, Bill, can you talk to that point, and let's go
9 to Mike.

10 MR. BAUGHMAN: Thank you, and that last
11 point that was just brought up by Jim and responded to
12 by Mr. Brach is I think right on, and I appreciate
13 that response. I would just note that I think we have
14 a great deal of appreciation for the public process
15 that is going through which we hope will result in an
16 improved technical basis for the protocols.

17 And notwithstanding what I said previously
18 about the value of all of this in terms of instilling
19 public confidence, I do think that the public comments
20 will result in better tests. And so I do appreciate
21 this whole process.

22 FACILITATOR CAMERON: Thank you, Mike.
23 Josie.

24 MS. LARSEN: I would like to reiterate
25 what Mike just said. I appreciate being involved in

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1 the public process, and Nye County is a small county
2 north of Las Vegas here, and it is an opportunity for
3 us to kind of participate in the process, and help our
4 constituents in ensuring their public health and
5 safety.

6 And I would like to caution how you define
7 your audience, because you are trying to instill
8 public confidence and you have experts here, and the
9 results are going to be conveyed in a different manner
10 than if you were going to just the general public.

11 So I would encourage you to keep that in
12 mind as this process moves along. Thank you.

13 FACILITATOR CAMERON: Thank you. Michael.

14 MR. CONROY: Thank you, and I also would
15 like to thank the NRC for having these meetings, and
16 inviting us to participate.

17 I wanted to bring up a couple of points
18 that are stated in the test protocols report that the
19 current regulations and programs for transporting
20 spent nuclear fuel do result in a high degree of
21 safety, and NRC certification of spent fuel casks has
22 contributed to an excellent safety record for
23 transporting spent fuel.

24 And the safety protection provided by that
25 current transportation regulatory system is well

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1 established. Over the past 50 years, there has been
2 substantial experience gained in the transportation of
3 spent fuel, and in the United States there have been
4 over 2,700 shipments of spent fuel, and traveling over
5 1.6 million miles.

6 None of those shipments has resulted in
7 the release of the radioactive contents. Similarly,
8 thousands more of shipments have been made safely
9 throughout the world. What we need to keep in mind is
10 what the NRC staff is examining here is the adequacy
11 of the analytical methods and data that are used to
12 estimate the response of casks to improbable extreme
13 accidents.

14 And that it is not the package performance
15 study that is intended to involve the development of
16 new standards for transportation casks, although it
17 has been pointed out that there is that possibility.

18 But we anticipate that the tests described
19 in the test protocols will demonstrate the validity of
20 computational methods used to model the impact, and
21 thermal response of Type E spent fuel transportation
22 casks.

23 We would like the NRC to make clear that
24 these tests are not proposed as new standards for
25 package certification, per se, and we would also like

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1 to have them correlate the test conditions involving
2 things like unyielding surfaces, to real world
3 conditions of transport. Thank you.

4 FACILITATOR CAMERON: Okay. David, do you
5 have a few words?

6 MR. ZABRANSKY: Yes, just to follow up on
7 what Mike said. We also want to reiterate the
8 department's commitment to supporting the cask
9 performance program, and the NRC's efforts in this,
10 and to encourage the stakeholders and the public to
11 participate in the development of these protocols,
12 because that is the only thing that can make these
13 things helpful, and to instill confidence in the
14 process.

15 FACILITATOR CAMERON: Okay. Thank you.
16 Cindy.

17 MS. MARQUES: I am really new at this, and
18 so I would like to thank you for inviting us. I have
19 no comments right now, but I have learned a lot, and
20 I think a lot of the comments that are being said, you
21 guys really need to look into. And I will take this
22 back to my tribal council, and then we will have
23 comments by them as well for you. Thank you.

24 FACILITATOR CAMERON: Great. Thank you
25 very much. Calvin.

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1 MR. MEYERS: My name is Calvin Meyers, and
2 I am a full-fledged Paiute, and this is actually some
3 of my people's territory that you are on, and so you
4 are welcome here. I don't think that I could ever
5 trust you, because I can't trust anybody that won't
6 come and teach me what they are talking about.

7 And I am not grateful that you invited to
8 me, as I think you should have anyway. It is not
9 something that should be automatic (inaudible) can't
10 be here. My comments are -- and I am not a scientific
11 person. I barely finished high school. I took a year
12 UNLV and was bored to death.

13 But I do understand things, and one of the
14 things that I do understand that you are doing tests
15 for certified miles an hour, and the last time I was
16 on the freeway, which was this morning, I was doing at
17 least 85. And there were cars coming from everywhere,
18 too.

19 And when you said that the environment is
20 the last on the list of concerns, to me that is the
21 first, because to me without the environment I
22 wouldn't be able to live. Without the environment, my
23 people would die.

24 One of the things that I wanted to say
25 today was that it took 5 or 6 years before the NRC

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1 even acknowledged that they have a trust
2 responsibility to the tribes.

3 To me, to fight for it for so long, and it
4 took even longer to understand why you guys do what
5 you do, because like was said here earlier, there are
6 a lot of scientific people around this table, and what
7 they do is they worry about their science, and they
8 don't worry about what they are doing.

9 They don't worry about what they are doing
10 to their own house. And when you tear your house
11 apart and you don't have a place to live, and that is
12 exactly what is going to happen if you don't really
13 watch what you are doing.

14 We would like to let you know that it
15 doesn't take an accident to have something like this
16 come out, but what can happen is -- and this really
17 reflects on my people, is that you can wipe out my
18 whole government with just one truck.

19 I am talking about people that cannot be
20 replaced, and you can have people replaced in Las
21 Vegas because you have more people come in, but once
22 you wipe out the Moapa Paiutes, they will no longer
23 exist. You cannot import somebody else.

24 It does not matter how much it costs, how
25 much it is worth, and let me ask Chip, how much is

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1 your life worth? And that is my point exactly.

2 FACILITATOR CAMERON: Is that a rhetorical
3 question?

4 MR. MEYERS: And it is like that you don't
5 understand the comment about being educated many times
6 and it still has not happened (inaudible), and you
7 have the trust and responsibility, and if you need to
8 go back to your legal counsel and ask them what they
9 are going to do about it.

10 And that rabbit that is running around out
11 there, and that bush, and that plant, and those things
12 that make us well, and that ground out there that
13 helps us, and I have been places where I would never
14 leave, because what happened is (inaudible) are there
15 for a purpose.

16 I pray every time I go somewhere, and I do
17 not pray to your god, but I pray to the man upstairs,
18 the one that made everything, and the one that
19 controls everything. He controls that car that I
20 drive. He controls everything that happens in this
21 universe. He controls the animals and the plants, and
22 the earth, and if the earth is contaminated, then all
23 of life is contaminated.

24 And those plants are dead and those
25 animals are dead, and in my upbringing we were taught

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1 that (inaudible) at one time, and that's why I have to
2 let you know that you have to put the environment
3 first, because without the environment, the rest of us
4 won't be here. Thank you.

5 FACILITATOR CAMERON: Okay. Thank you,
6 Calvin. And the issues report that Calvin was talking
7 about is this gold sheet that is back on the table for
8 anybody who didn't get a copy of it.

9 And, Bonnie, I am going to give you this
10 mike, because apparently that mike is not working real
11 well.

12 MS. BOBB: Thank you. That is hard to
13 follow up. That is really hard to follow up. I am
14 not Shoshone. I am Shoshone by marriage to a Western
15 Shoshone Spiritual Person. And whenever I read the
16 reports, what was missing for me was some sort of
17 human factor. It was very mechanistic. This is what
18 will happen to the man-made objects.

19 And there was no concern with the people
20 who are out there on the ground, like the tribe that
21 I am from. There was no -- even concern for human
22 health is not enunciated very well, but like I said,
23 we are 12 miles from (inaudible), and I am not going
24 to steal John Wells' thunder because I don't know that
25 much about it, but the impact on the animals, and the

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1 impact on the ground.

2 My husband would tell you that to talk to
3 the mountain and to look down from the tops of the
4 mountains, and to be there, that landscape, that whole
5 -- well, it is hard to explain. The BLM and the
6 Forest Service comes to the tribe and they say will
7 this have an impact on your cultural ways or your
8 spiritual life, or whatever.

9 And they say, oh, we are not going to do
10 that. We are going to do that right here, and they
11 don't quite understand that that whole area is sacred,
12 and they don't quite understand that what you do to
13 that over here affects what I am doing and thinking of
14 here.

15 And to think of my husband on top of the
16 mountain praying and looking down upon this railway or
17 these trucks, or a combination of both, is kind of
18 like I hope that he is praying really well. But I
19 think that will take away some of the spirituality,
20 and I don't think that can be replaced.

21 I am interested still in finding out the
22 hard questions, because we ask what risk is
23 acceptable, and how would you get to us, and who are
24 the people that are qualified to be on the scene, and
25 where is the money going to come from to give the

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1 education and the training, and the equipment for the
2 people who have to be immediately on the scene so that
3 all of the Shoshone people don't die.

4 And what about the plants, and what about
5 the animals, and what is going to happen to the
6 environment, and what water are we going to drink.
7 So I need to know what kind of probability it refers
8 to, and in most cases, what is mostly safe. And what
9 is mostly safe?

10 What is mostly safe? I want to know what
11 the acceptable limits. I want to know what is
12 acceptable, and what level of life is acceptable to
13 remain. What level of accidents are you willing to
14 accept. I want to know what the mortality estimates
15 are if there is an accident.

16 If there is the worse case scenario, what
17 is going to happen, and what will the mortality rate
18 be, and will happen to the water. And in commenting
19 on Ms. Larson's comments, whenever I read these
20 documents, I wonder why I am sitting here and not a
21 Shoshone person.

22 And it is because Shoshone people who have
23 come to attend this meeting can't quite understand
24 some of the jargon and some of the science that is in
25 here about distributions, and I said, well, maybe I

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1 can, but it is not making any sense to me either. It
2 is like whenever the documents are written -- and I
3 know that it is very difficult to write something that
4 makes sense to all people, but the tribe is not the
5 public, and the nation is not the public.

6 We should be addressed, and when I say we
7 loosely, we should have been addressed first and that
8 never happened. If you come to us and we don't
9 understand you, it should be explained. That is part
10 of the consultation process.

11 Whenever I read these documents, they are
12 quite too complex for a normal person in our society,
13 and the questions that you are asking are probably
14 beyond a lot of people's capabilities. I don't know
15 how many miles per hour is acceptable, and how many
16 tests are acceptable and that there should be.

17 But as a scientist, I look at it and there
18 is not enough information, and so essentially this
19 document tells me that there is too much for some
20 people and not enough for others. I want more. I
21 want more of the science in here, and I want to know
22 the numbers, and I want to be able to make a decision
23 for myself, and I think the rest of the people do,
24 too.

25 I also think that there should be -- and

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1 the reason that I asked about the consultants, is that
2 a lot of the questions that you are expecting us to
3 answer should be answered by people who hold an
4 opposite view, but who are experts in their field.

5 They will be the ones who could ask the
6 good questions and proceed to interrogate you when you
7 come back with an answer, because I think that is what
8 we want, because I think that we want life to
9 continue.

10 FACILITATOR CAMERON: Thank you, Bonnie,
11 and I want to emphasize Calvin's point about the
12 importance of education.

13 MR. WELLS: Well, following Calvin and
14 Bonnie, I think we can all go home now. I have been
15 following these meetings, and I have been boring
16 Federal, State and County officials with the same
17 statement time after time, and I will make it quick
18 and sweet. You have no more authority to transport or
19 store nuclear waste at Yucca Mountain than you do to
20 take it to the Yukon Territories. It does not belong
21 to you.

22 It is within the borders of the Western
23 Shoshone Nation, and we have no intent to secede our
24 territory so that you can further poison mother earth
25 with this material. There is not much more to be said

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1 about that.

2 I just made a few notes on some points
3 that have come up, and the discussion is, one, public
4 confidence. I listened to a gentleman talk for a few
5 minutes and I didn't time it, on an impact limiter.

6 If you want public confidence, you need to
7 speak the way the public can understand, and an impact
8 limiter is a shock absorber. It's simple. Half a
9 second and its out.

10 I have looked through some of this
11 material, and from what I see your tests are limited
12 to impact and fire. I see no reference to attack by
13 small arms fire, explosives, or attack by aircraft
14 crash. The public wants to know that.

15 And if you don't take one of those
16 canisters out and lay at it with an M-16 armed with
17 armor piercing shells, no one is going to believe
18 anything that you have to say. You do not want to
19 test to a failure, and you go to a point and then you
20 predict.

21 Predictions are theoretical, and let's put
22 in the way that people speak. It is just your best
23 educated guess. But it is a guess. The public
24 doesn't care what the canisters can do. The public
25 will want to know what they can't do. Thank you.

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1 FACILITATOR CAMERON: Okay. Thank you
2 very much, John. Let's go to Jim.

3 MR. PEGUES: Well, first of all, I would
4 just like to say that for the record the City of Las
5 Vegas strongly opposes the Yucca Mountain project.
6 However, since we find ourselves in the situation that
7 we are today, I would must like to first of all thank
8 the NRC for having this forum today, because I think
9 it was very valuable to be able to have this
10 discussion, both pro and con, on the situation.

11 As part of my specific comments, I would
12 just like to encourage the NRC to test all of the
13 casks. I know that Judy mentioned the analogy about
14 how you test students, and I would just like to say
15 that using a miliary model, you can't use the
16 parameters for a B-1 bomber to decide how a B-2 bomber
17 will perform.

18 I also would like to recommend that you
19 test to failure, because I believe that we need to
20 know exactly what the abilities of the casks are, and
21 just to test in the laboratory, or use modeling, or
22 just test to a certain point, I don't believe that you
23 have looked at the answers that we really need to
24 make an informed decision.

25 And lastly I hope that the comments that

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1 are derived here today are handled a lot differently
2 than what we have perceived the comments were handled
3 by the DOE in regards to the final EIS.

4 And I would just like ask you to take our
5 comments back, and it has been brought up by several
6 other people here in the room, and to make sure that
7 they are integrated properly so that we can have the
8 best outcome. Thanks.

9 FACILITATOR CAMERON: Okay. Thanks, Jim,
10 and hopefully we will get to defining what test to
11 failure means this afternoon. Kalynda.

12 MS. TILGES: Kalynda Tilges, Shundahai
13 Network executive director. I have a couple of
14 statements to read, and I also have a question. First
15 of all, I have a question.

16 When I was invited to this event, I was
17 told that there would be time for public comment and
18 that this was a public workshop. I see very little
19 public. I see very little room for public, and also
20 on the agenda, I see no room for public comment, and
21 I would like to find out what is going on with that.

22 Secondly, I would like to make a comment
23 about the unmoving surface. I am not sure what
24 happens to the earth by using an unyielding surface
25 seems to me like smoking mirrors.

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1 I believe that the public needs the
2 reality of different types of surfaces. What is going
3 to happen if a cask drops and lodges into the cement
4 and asphalt of a freeway. What happens when you try
5 and drag it out. I think that would be very telling.

6 I think you need to explain to the public
7 about unyielding surfaces. I am not against using it,
8 but it should be in conjunction with real life
9 surfaces, and not a stand alone test.

10 With that said, I am going to go on and
11 read a statement from the Shundahai Network about
12 these whole proceedings, and what I am going to say
13 here and more up on the table in talking points, "Too
14 little Too Late."

15 And also in grass roots organizations in
16 New Mexico, who have been living with radioactive
17 transportation shipments in every day life for quite
18 a while now have sent us a letter outlining their
19 experience with what has happened with their
20 shipments, and how whatever is decided will continue
21 to degrade after it has been decided.

22 So with that said, I am going to read what
23 Shundahai has to say about all of this. The Nuclear
24 Regulatory Commission has issued a draft report for
25 public comment on the standard for testing high level

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1 radioactive waste transportation casks.

2 They said that public opinion is important
3 to them. The NRC says that it really wants public
4 input in what they propose to do. If this is true,
5 why would they plan the public workshop for a weekday
6 when most people are at work or at school.

7 If the NRC really does care about public
8 confidence and the safety of the American public,
9 which should come first, why does the draft report
10 state in more than one place in the executive summary
11 alone that they do not intend to develop new standards
12 for cask testing, but the agency's current regulations
13 are as adequate as they need to be, and that this
14 report does not employ any commitment on the part of
15 the NRC to conduct any of these tests.

16 The Shundahai Network feels that the NRC
17 should make full-scale testing to failure a licensing
18 requirement for every cask design. The NRC now is
19 suggesting just two casks to extra regulatory full-
20 scale physical testing.

21 At the very least the agency should test
22 every cask design proposed for shipments to Yucca
23 Mountain private fuel storage projects. The NRC
24 proposes only fire and crash tests. The testing
25 regime should be expanded to include puncture,

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1 crushing force, and deep emersion tests.

2 The proposed tests will not evaluate cask
3 vulnerability to an attack of any kind. The NRC
4 should expand the testing regime to include the
5 explosive and missile attacks, and the NRC should test
6 full-scale tasks, and not just scale models.

7 They should also test casks to failure and
8 not arbitrary standards. The Shundahai Network
9 expects reevaluation of the NRC cask performance
10 standards with meaningful, and I will repeat, with
11 meaningful stakeholder participation.

12 And again meaningful stakeholder
13 participation from all affected areas for all proposed
14 routes, including Salt Lake City, which is important,
15 and that has been missed; the development of testing
16 protocols, selection of test facilities, and
17 personnel.

18 Full-scale testing to failure of all casks
19 prior to NRC certification, and this would include
20 every cask model used or proposed to be used; casks
21 selected at random; in very rural accident and attack
22 situations; testing all possible shipping scenarios --
23 train, truck, barge, et cetera, whatever you manage to
24 come up with.

25 Complete openness and transparency of

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1 every step in this process, including costs, and media
2 and public oversight of all tests. Thank you very
3 much.

4 FACILITATOR CAMERON: Okay. Thank you,
5 Kalynda. We will be going out to all of you before we
6 break for lunch, which will probably be about four
7 o'clock.

8 (Laughter.)

9 FACILITATOR CAMERON: But we will get
10 through this and then we will break for lunch. And if
11 the NRC folks want to add anything important. Go
12 ahead, Bill.

13 MR. BRACH: I just wanted to add one
14 comment, Chip. Earlier, Jim had raised a question
15 with regard to the NRC's planned use if you will of
16 the results of the package performance study test. I
17 want to try to clarify two aspects.

18 One, in the opening comments I had
19 mentioned and had summarized as well, that the NRC
20 believes that our current rules and our current
21 regulations, and our current criteria for tests and
22 certification of transportation casks are adequate.

23 And that is our belief and support of
24 existing regulations, criteria, and standards. I want
25 to clearly clarify that this comment from my

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1 experience, and I have worked in different parts of
2 the NRC over my career, whether it be in
3 transportation or in other regulatory activities,
4 clearly if we conduct a study, and if there is an
5 operational event, or information comes to the NRC
6 that would cause us to step back and relook at our
7 current processes, our current standards, and current
8 approach, and question the adequacy, we do that.

9 And so in particular to your earlier
10 comment, Jim. If from the package performance study
11 test there is information that we learn from the
12 results of the activities that cause us to relook at
13 our standards, we clearly will and will do that.

14 FACILITATOR CAMERON: Okay. Thank you.
15 Andy, did you want to make a comment?

16 DR. MURPHY: I wanted to say one sentence,
17 I guess. And that was initially a comment that Judy
18 made sort of implied that this was some sort of a
19 support for the Yucca Mountain program.

20 The package performance study is being
21 done for transportation in general. It does not imply
22 some sort of an NRC endorsement of the Yucca Mountain
23 project.

24 This is being done for transportation, and
25 if there was not a Yucca Mountain, you are talking

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1 about moving this stuff around, and this would be part
2 of our program to understand how to best move this
3 stuff, to move spent nuclear fuel around safely.

4 FACILITATOR CAMERON: Okay. Thank you,
5 Andy. Ken, did you have anything?

6 MR. SORENSON: No.

7 FACILITATOR CAMERON: Let's go to John
8 Kessler.

9 MR. KESSLER: We also have high confidence
10 in the existing regulations to protect the health and
11 safety of the public. We think that the tests that
12 are required in the current regulations are really
13 quite severe, and we are also confident that the way
14 that cask designers need to go through a certification
15 process, including testing and maintenance of those
16 casks, further ensures a large margin of safety on top
17 of those requirements.

18 Having said that, if PPS is going to
19 proceed, and go into what is extra regulatory, and by
20 nature extra regulatory means it is not necessarily
21 tied to the regulations, although certainly a review
22 of regulations is possible as is anything else, then
23 one has to ask what is your purpose.

24 And there is two purposes, and one is to
25 validate certain models, and you talked about plastic

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1 deformation, which again trying to use more common
2 lingo, plastic deformation is to imagine a piece of
3 clay dropping on the floor, and it just kind of
4 spreads out and deforms, and changes shape. That is
5 plastic deformation.

6 I believe that is currently what the test
7 protocol is supposed to get to, and what we expect in
8 99.99 -- and however many nines that you like --
9 percent of most accidents, is what is called elastic
10 deformation.

11 Drop a spring on the ground and it comes
12 back to the same shape that you had it, and models are
13 developed for that are what we feel are adequate for
14 the vast majority of cases.

15 Now, testing to failure. First of all,
16 what is failure, and we have not really discussed
17 that, and hopefully we will get to that later on. And
18 reading the test protocols, failing the cask with the
19 MPC inside, which is in NRC's view as well the primary
20 barrier, is not failure in my opinion.

21 Failure is something that might initiate
22 release and of course you have to look at release and
23 what are the consequences, and you get into a lot of
24 subjective input there, which is probably one of the
25 reasons why we are having this meeting.

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1 So I think we need to have that clarified
2 on what failure is. I guess my concern about tests
3 and doing testing out to these extra regulatory
4 regions is -- you know, this idea that you are going
5 -- you can always create a set of conditions to fail
6 a cask.

7 And what relevance do those have to real
8 world conditions is something that the NRC needs to
9 address and put in context for us. Our belief is
10 looking at some of that probability information in
11 Appendix A, certainly you are making conservative
12 assumptions there.

13 And we feel that the likelihood of the
14 conditions leading to failure is very, very low, as it
15 should be. One then has to weigh the cost of going to
16 a certain kind of test to get test data, versus trying
17 to address testing failure.

18 Personally, I don't understand what it is
19 that we are getting out of going to failure. You
20 know, what is the purpose of testing to failure. If
21 you want to see where the edge is, fine, but don't
22 start with the failure test if you are going to talk
23 about a \$20 million program.

24 I also endorse that if you are going to do
25 this, take the structural committee's recommendations

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1 and start with your regulatory criteria testing. That
2 way you are likely to be able to salvage the same
3 container and get some more testing out of it and have
4 a more cost effective approach, and that way you
5 actually can get some idea of where your failure point
6 is, as well as perhaps bolstering a bit more
7 confidence in the casks at the current regulatory
8 criteria. Thank you.

9 FACILITATOR CAMERON: Thank you very much,
10 and we will go to some of those questions when we get
11 to that. Judy.

12 MS. TREICHEL: I wanted to back up what
13 Jim Pegues said about these comments making a
14 difference and being taken into consideration. We
15 went through a long and torturous process, and we all
16 commented at great length on Part 63 having to do with
17 Yucca Mountain, and believe that we were robbed
18 because we didn't see any of the really great comments
19 carry on through, and we also didn't see why not.

20 And so as Diane has said, I think you need
21 to tell us why you didn't do some of the things that
22 were here, and think very seriously about taking this
23 to heart with what you are hearing. There are a lot
24 of people here, and some of whom are losing a day's
25 pay in order to be here, and they do this for the

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1 right reasons.

2 And the NRC needs to make a far better
3 showing on these comments than they did previously.
4 The other thing that I think needs to be checked out
5 as far as tests are concerned is the terrorism thing.

6 And I am not throwing that up like a red
7 herring. It is there, and as we just saw with PFS,
8 the Air Force factor is a major one when it comes to
9 Yucca Mountain.

10 If you are looking at that, and it comes
11 along whenever you are transporting anywhere near a
12 military operation, there are jets flying around and
13 one could hit a cask.

14 And a cask could be the subject of
15 sabotage. I was sent a book and I am reading it for
16 review right now, in which it is probably going to be
17 a best seller, and it is about a shipment of high
18 level waste being captured.

19 And so this is on people's minds, and
20 within the last 18 months, people in the United States
21 have been subjected to things that could never have
22 happened.

23 If it had been up the NRC to run the
24 tables on the possibilities of some of the things that
25 have happened to the United States citizens just

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1 starting from 9/11 and coming forward with anthrax,
2 and the sniper, and the Columbia falling out of the
3 sky, and a few other things, these would have been
4 ruled out, and screened out because of the lack of
5 probability.

6 So people in this country have become less
7 confident in general, and you are going to have to do
8 a lot, and you are going to have to get over the idea
9 that by looking at what happened before, or by
10 estimating what can happen, we can be really wrong.

11 And you are an agency that is paid for by
12 the people that are here to serve the people, and that
13 has to happen, and you have to serve the people, and
14 you have to take these things into consideration and
15 consider these comments. Thank you.

16 FACILITATOR CAMERON: Thank you, Judy.
17 Let's go to Peggy.

18 MS. JOHNSON: My name is Peggy Maze
19 Johnson, and I am representing Citizen Alert. Citizen
20 Alert started 27 years ago in this state because they
21 were talking about bringing nuclear waste to the State
22 of Nevada.

23 I guess I start out always with my mantra,
24 which I am not a scientist, and I am not a
25 transportation expert. But what I bring to my job is

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1 30 years of politics, and all I have seen so far in my
2 short tenure with Citizen Alert are decisions made by
3 politics.

4 I have spent a lot of time in politics and
5 I have spent a lot of time working in government, and
6 it pains me to ask the question do I trust my
7 government, and it pains me even more to say, no, I
8 don't.

9 I believe that we need to do everything to
10 make sure that the public understands and feels safe
11 with the process that you are all going through. Mr.
12 Murphy said, Judy, this is not going to make you
13 happy, and yet every other word that comes out of your
14 mouth is public confidence.

15 You know, to me that sounds like a public
16 relations campaign, and that is what it has felt like
17 since I got involved in this issue. I sat down with
18 Margaret Chu (phonetic) and some of her people from
19 DOE and I walked out, and all of a sudden there was
20 this flash in my brain.

21 And what I saw were all those tobacco
22 executives sitting at the table in front of Congress
23 and saying, oh, no, this doesn't kill. Oh, no, this
24 won't cause cancer. Oh, no, this won't hurt you.

25 You need to do more than have an ad

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1 campaign. You must -- you absolutely must make this
2 if you intend to do it, as safe as you can do it. I
3 guess I am appalled that we are sitting here 50 years
4 maybe or even longer too late.

5 Why were not all these questions asked
6 when we were putting up nuclear power plants and when
7 we were creating nuclear waste? Why are we looking at
8 it now when maybe it is too late to make any of us
9 safe.

10 And that just absolutely outrages me. I
11 am not going to be here that much longer, but I have
12 children and I have grandchildren, who will have
13 children and who will have grandchildren.

14 And I think you have to understand the
15 absolute monumental decisions that you have facing
16 you, and I just have the feeling that you are all so
17 glib about it, and I don't think you even get what it
18 is.

19 You know, you talk about computer
20 modeling. I am one of those people that is still
21 trying to figure out to get those little figures
22 across the television and into the television screen.

23 How are you going to explain computer
24 modeling to the people that are sitting out on these
25 transportation routes? These proposed routes go

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1 through 43 States, between 6 and 700 counties, and
2 over a hundred-million people are going to be exposed
3 to this waste that you all are in charge of
4 transporting safely. Please do your job well.

5 FACILITATOR CAMERON: Thank you, Peggy.
6 Fred.

7 MR. DILGER: Good afternoon. I am Fred
8 Dilger, here representing Clark County. First, I want
9 to thank the NRC for having these hearings here. We
10 appreciate the opportunity to comment, as well as the
11 point in which and the process in which we are
12 commenting here.

13 Everything that I am told and have been
14 able to learn is that the NRC is genuinely interested
15 in our input, and that we have a real opportunity here
16 to shape this program for the better.

17 With that said, I am passing out the
18 counter-proposal for cask testing. This was prepared
19 by the State of Nevada and Clark County jointly, and
20 we are calling for full-scale regulatory testing of
21 the regulatory tests. That is what we want to see.

22 We believe that there are issues
23 associated with that that we need to talk about today,
24 and testing to failure and the marginal costs to the
25 additional tests, and of course when we talk about

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1 failure, we have to define failure.

2 Is it a loss of shielding, or a loss of
3 containment, but those are technical issues that we
4 can talk about and you will get input on. But we do
5 believe that the changed security environment, as well
6 as the problems associated with computer validation
7 and computer modeling, pretty much demand full-scale
8 cask testing.

9 One thing which I need to address, and I
10 need to address this comment to the NRC staff here,
11 because last week you heard someone representing a
12 Northeastern State describe how comfortable they were
13 with the existing modeling process and procedures.

14 And I just have to say that although these
15 proceedings are not aimed at Yucca Mountain, nor at
16 the PFS facility, the overwhelming numbers of
17 shipments that will take place in the future in the
18 United States over the next 50 years will ultimately
19 either be to Yucca Mountain or to the Gasuhu
20 (phonetic) facility given what we know today.

21 And something like 75 percent of those
22 shipment miles will occur west of the Mississippi
23 River. So from a Western perspective, or from a
24 perspective out here, this is a Western kind of
25 problem, and we are the ones who are going to be

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1 bearing a great deal of the brunt of this issue.

2 And that relates to the cost issue. Mike
3 Baughman raised it a little bit, and hopefully we will
4 be able to talk a little bit more about it this
5 afternoon.

6 But when seen in the perspective of the
7 other programs that are out there on the table, the
8 WIPP program, the Yucca Mountain program, the private
9 field storage program, and even a Cadillac, a Rolls-
10 Royce testing program is not that expensive.

11 I do need to echo Bob Halstead's comments
12 about 6672, and Clark County was the only local
13 government to actually pay a contractor to do evaluate
14 6672, and we thought it was extremely deficient.

15 We do not think that the issues report
16 addressed those deficiencies adequately, and when we
17 were down in Waste Management recently, we saw the
18 6672 risk analysis enshrined into some of the
19 Department of Energy's computer models.

20 So we have already seen a two-thirds
21 reduction in risk thanks to the use of that report
22 that is now being hard-wired into the Department of
23 Energy system, and that is very disturbing.

24 The last thing I want to say is that I
25 believe -- and we have heard it around this table

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1 before, and I said it last week in Washington, and I
2 will say it again, and that is that I think that the
3 NRC's primary mission of public safety is a laudable
4 one, and I think that is what you should seek to test.

5 I do not think that public confidence is
6 something that you can test to. I think you can
7 achieve -- we need to focus on public safety and
8 anticipate that public confidence will flow from that.

9 I think that confidence testing is not
10 useful, and I think it is putting the cart before the
11 horse. Let's get the safety right, and then the
12 confidence will come out of that. Thank you.

13 FACILITATOR CAMERON: Okay. Thanks, Fred,
14 and we will see if we can get some extra copies of the
15 paper for everyone before everyone comes back from
16 lunch. Bob.

17 MR. HALSTEAD: Bob Halstead, State of
18 Nevada, Agency for Nuclear Projects. We think that
19 cask testing is possibly the single most important
20 nuclear waste transportation safety issue, and it is
21 one of the reasons why Nevada has spent a great deal
22 of energy over the past 15 years refining our
23 proposals and studying the costs.

24 And we are really appreciative of the
25 NRC's approach here, and it may not sound that way,

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1 because there are many things that frankly we do not
2 agree with the NRC on, and we are not going to hold
3 any punches back.

4 On the other hand, on this particular
5 proceeding, I take them at their word, and I say this
6 especially to Bill, who over the years has had to take
7 the brunt of many arguments with me. I believe that
8 Bill is a person of integrity and when he tells me
9 that he has told his staff that everything that they
10 put on the table in this report is open is open.

11 I believe that, and I think that we have
12 to give them the benefit of the doubt, all of us, and
13 give them our best recommendations. Obviously
14 different stakeholders are going to make different
15 recommendations. The State of Nevada has a proposal
16 for both regulatory testing -- and that is testing to
17 see if the casks actually meet the safety standards in
18 the regulations.

19 Plus, a combination of full-scale testing,
20 computer simulations, scale models, and component
21 testing, to get at that issue of where are the failure
22 thresholds, and can we feed that back into our
23 regulatory analysis and see if our standards are
24 adequate.

25 We are developing a more detailed proposal

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1 where we are going to try and take the NRC's approach
2 and combine it with our approach, and unfortunately we
3 have not had enough time to do that yet.

4 But I suspect that we will have a very
5 detailed proposal by May 30th. I wanted to stress two
6 points here other than the importance of public
7 participation and stakeholder participation.

8 First, the tests really have to be focused
9 on public safety. Any public confidence that comes
10 about is laudable, but the goal is safety. And
11 secondary costs matters. Now, I have to applaud you,
12 Mike Baughman, for getting Andy to put a cost number
13 out.

14 I tried to interrogate him on this last
15 week and he wouldn't give a cost number. Now, we have
16 been studying these costs for 15 years, and we know
17 that the TRUPACT test cost about \$5 million back in
18 the late '80s.

19 We know that the British tests that you
20 see in Operation Smash Hit cost about \$8 million in
21 the early '80s for both regulatory and demonstration
22 testing.

23 We made an estimate on our own that their
24 program would cost 20-to-30 million dollars, and so I
25 think when Andy says more than 20 that we are still in

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1 the same ball park.

2 We think that it is 20-to-30 million
3 dollars for testing two kits. We have got a detailed
4 cost proposal in our paper, and man, we have excessive
5 public participation costs to add in there, and we
6 have hostile peer review in there, and we have lots of
7 contingencies, because I think that these technical
8 details, like installation of heaters, and the
9 difference between dummy and surrogate fuel, I think
10 it is going to be extremely difficult to instrument
11 and record the data from these tests.

12 And so it is possible tha we have
13 overstated those costs. We think that you can do a
14 really comprehensive testing program of the 5-to-8
15 casks that would be used for Yucca Mountain with or
16 without a PFS facility in there for somewhere in the
17 range of 50-to-70 million dollars.

18 And I ask you to consider this. The costs
19 are paid by the rate payers primarily, and a small
20 part for defense activities comes from taxes, but
21 mostly it is the people who benefit from electricity
22 from nuclear power plants that are going to pay for
23 this through the Nuclear Waste Plan.

24 The repositories are estimated to cost
25 about \$60 billion, give or take \$10 billion, and maybe

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1 that is a low number, but we will live with it for
2 now.

3 And the transportation costs, the State is
4 estimating about \$9 billion. So a really
5 comprehensive testing program that does regulatory
6 testing and testing to fail, regulatory testing for
7 all of the casks, and for some sample of them and
8 finding out where the failure threshold is, costs less
9 than one percent of the transportation component out
10 the repository program.

11 So I ask you to consider that as a basis
12 of reasonability when we throw these different testing
13 proposals on the table this afternoon, and I look
14 forward to that. Thank you very much.

15 FACILITATOR CAMERON: Thank you and let's
16 go to Rick Boyle.

17 MR. BOYLE: Thank you. I am Rick Boyle
18 and I work with the U.S. Department of Transportation.
19 I work in the office where we regulate all hazardous
20 material transport in the U.S., and that is all nine
21 hazard classes; where one class is radioactive
22 material.

23 We are interested, as the NRC is, in
24 improving our program and improving the safety of our
25 program, and that is why we are here today, is to

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1 learn lessons from here, and to look at this program
2 and to make sure that the planning and the execution
3 of the program is valid.

4 And then when it is completed, to take the
5 results and to look at how they affect our overall
6 HAZMAT program, and how we can use the results to make
7 all of HAZMAT transport safety better. Thank you.

8 FACILITATOR CAMERON: Okay. Thank you
9 very much, Rick. Let's go to Tom.

10 MR. DANNER: Good afternoon. My name is
11 Tom Danner, and I am with NAC International, and I
12 represent the design faction of providing packages to
13 the industry. I believe that the regulatory criteria
14 that we currently have in place definitely does
15 provide us a safe industry.

16 The analysis that we have been doing is I
17 think supporting and represent the methodology that we
18 have in place, is going to be validated through this
19 testing program.

20 We have done it before, and in terms of
21 needing to go ahead and test a full-sized cask , I
22 believe is in support of public confidence. The
23 technology has been around in the industry, and we
24 verify all our methods in great detail.

25 We have gone through testing programs that

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1 have validated these methods to be acceptable in
2 showing that we can meet the criteria that we apply in
3 the industry. So I believe that what we are trying to
4 do here really now has established the public
5 confidence in what we have in place as a safe system.

6 The testing that we have done have gone
7 ahead and overtested the systems that we have in
8 place. I have gone ahead and tested systems in excess
9 of 6, 7, and 8 times of what the criteria and the
10 design safety limits were for these packages, and they
11 have performed very, very well.

12 This is outside of course of the licensing
13 aspects or programs that we were trying to put in
14 place. So I have a high confidence level in what we
15 have on the roads and as well as the criteria that we
16 have in place.

17 So I see that the whole program has really
18 been focusing on public confidence, and we need to
19 satisfy that. That is basically our responsibility.

20 FACILITATOR CAMERON: Amy.

21 MS. SNYDER: Yes. I would like to say
22 that the NRC has high confidence in our current
23 regulations, and we believe that those cask
24 certification requirements ensure the public health
25 and safety, and the environment, and we would like

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1 your comments as far as our draft test protocol, and
2 when we consider your comments and your rationale of
3 why you feel the way that you do.

4 And we will consider all of your comments.
5 We plan on putting out and developing a detailed plan
6 or procedures if you will for test protocols, and we
7 will address the fact of what comments we have
8 incorporated, and why, and what comments we have not.

9 We have not decided how we are going to do
10 that, but that is very important. We want your
11 comments, and specifically this testing to failure,
12 and also the success of the tests, and what would
13 constitute success of the tests.

14 So these are very important questions and
15 again nothing has been decided, and we appreciate your
16 participation in this workshop.

17 FACILITATOR CAMERON: Okay. Thank you
18 very much, Amy. Obviously we are behind, but I think
19 we have a good foundation, and perhaps during the
20 lunch hour we could spell out some specific issues for
21 discussion so that we can move through that really
22 efficiently.

23 And how about all of you out here? Thank
24 you for sitting patiently. Does anyone want to make
25 a comment or ask a question? And we will go back out

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1 this afternoon. Yes, sir?

2 MR. CARR: Yes, the last time I spoke to
3 somebody -- my name is Jay Carr, and I am not
4 affiliated with any organization. The last time I
5 spoke with the Yucca Mountain scientists, I came down
6 to ask you about climate change, and my confidence was
7 shaken when they told me that they had projected
8 analyses which contradicted the existing scientific
9 information about when is the best (inaudible).

10 And it seems to me that eventually these
11 casks could be under water, and there is a good
12 chance, and I am curious as to what might happen. Mr.
13 Sorenson might know or he might not, because they told
14 me that they got the projected analysis from Europe.
15 So you might not. What might happen if the integrity
16 of the casks are compromised by water?

17 FACILITATOR CAMERON: Thank you. Ken.

18 MR. SORENSON: Well, as you probably know,
19 the protocols do not cover emersion, and that is one
20 of the things that we talked about last week, and I
21 know that Bob Halstead mentioned that with the barge
22 shipments, particularly in the Great Lakes, because it
23 is projected that there are going to be a fair amount
24 of shipments on barges.

25 From a technical standpoint for that type

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1 of emersion, at least in near term, we don't see an
2 issue in terms of losing containment of the material
3 from emersion.

4 That said, if you had Yucca Mountain under
5 water for a long period of time, there could be other
6 issues in terms of corrosion and things like that.
7 Clearly that is not being covered in this particular
8 project.

9 FACILITATOR CAMERON: Okay. And thank
10 you, Ted, for that comment. Others?

11 MS. CUE: My name is Lisa Cue, and I am
12 here representing the Public Citizen, and we are a
13 national non-profit public interest organization based
14 in Washington, D.C. We have a longstanding concern
15 with the safety of transporting high level nuclear
16 waste, and to that end we oppose shipments to Yucca
17 Mountain, and we advocate stronger regulation for
18 nuclear waste transportation in general.

19 I just wanted to add one issue that has
20 been touched upon here, and that is the cost. I guess
21 from our standpoint at this point that the draft
22 proposal for the package performance study does not go
23 nearly far enough to address our concerns. And costs
24 have been mentioned by the NRC's presentations today
25 as a limiting factor there.

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1 And so I think or I would certainly not
2 want to suggest that costs be the dominant factor, or
3 be offered as a trade-off for public safety concerns,
4 but I think if it is being offered as a limiting
5 factor, we do need to know what is the cost projected
6 for these studies, and moreover what would be the
7 marginal cost increase for performing additional tests
8 once the infrastructure was already paid for.

9 And the second issue related to costs that
10 I wanted to raise is how is it being budgeted? I
11 think it would be very helpful to know whether in fact
12 from a budget perspective the package performance
13 study is a Yucca Mountain project.

14 Is this being budgeted out of the funds
15 that are normally directed to the Yucca Mountain
16 project, or is it being budgeted under the Nuclear
17 Regulatory Commission's general cost recovery
18 appropriations. Thank you.

19 FACILITATOR CAMERON: Thank you, Lisa.
20 Bill, can you answer that last question about where
21 these funds for this study come from?

22 MR. BRACH: Starting in the next fiscal
23 year the funds for the package performance study would
24 be coming from the Nuclear Waste Fund, and I think
25 that Bob Halstead was characterizing before correctly,

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1 the source of the nuclear waste funds, and how those
2 are derived.

3 One aspect that I want to mention with
4 regard to costs. Amy, beforehand, mentioned a general
5 ball park if you will for our estimate on the conduct
6 of the package performance study and the tests. A
7 concern that I have is that clearly cost funds need to
8 be available and provided for us to carry the study
9 and the tests out.

10 A concern that I have is that the purpose
11 of what we are trying to do right now is to identify
12 what types of tests, and what numbers of tests, and
13 what types of casks, numbers of casks, and what
14 condition should be considered in the testing.

15 And I would ask that I would like to keep
16 a focus on the testing, and the conditions, and the
17 parameters to help us focus. We need to be doing the
18 right tests and the best tests, and at this point in
19 time I think the focus on the types of tests, and the
20 conditions of the tests.

21 And the purpose of our study and our
22 activity right now are to try to identify what we
23 should be carrying out. Clearly, once we get beyond
24 that point and we are going to implement and proceed
25 forward, having funds available and the costs are

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1 going to be a really important factor.

2 In the approaches right now, I think I
3 would like to have our focus on what tests should we
4 carry out, and what types of casks, and the draft test
5 protocols have identified cask impact and fire tests,
6 and clearly today, and in the performance study
7 meeting that we had last week, there were suggestions
8 as well of doing emersion tests, and puncture tests,
9 and torch tests, and other types of tests, to be
10 considered.

11 And I think what we need to do now is to
12 discuss on what types of tests, and conditions of the
13 tests, and then we would have to factor in the costs
14 as we are proceeding.

15 But I would like to right now to try to
16 keep a focus on what is it that we should be doing in
17 considering these full-scale tests.

18 FACILITATOR CAMERON: Okay. And, Lisa,
19 did that clarification about where the funds come from
20 alleviate the concern that was behind your question?
21 I wasn't sure if it did or not, but I thought that I
22 would check.

23 MS. GUE: I appreciate the clarification.
24 It focuses my concern rather than alleviating it.

25 FACILITATOR CAMERON: Well, at least we

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1 accomplished something. All right. Anybody else have
2 a question or a comment before we go to lunch? John.

3 MR. HADDER: Hello. My name is John
4 Hadder, and I am the Northern Nevada Coordinator for
5 Citizen Alert, and if you really want to know an
6 impact limiter is, look outside. Citizen Alert's
7 model of a waste cask is sitting out there, and today
8 it is really the closest thing that we have to the GA-
9 4 design. All the rest of them are on paper.

10 I do appreciate the NRC doing this
11 process. I think it is very important and I
12 underscore, and I think that Citizen Alert stands
13 behind the comments of Bob Halstead and particularly
14 a lot of others here -- Calvin Meyers and all of the
15 other comments that people have made are very
16 important to our public process.

17 And there are things that I would like to
18 raise and I think one thing is that we hear over and
19 over again at the very beginning was about how this
20 process is not designed to examine the existing
21 regulations that are believed to be just fine.

22 And I think that is important in terms of
23 when you conduct any kind of an analysis, especially
24 a scientific one, and do you go in with a challenging
25 perspective, or do you go in with a perspective that

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1 you already believe, and that the answer that you want
2 to get is what you are going to achieve.

3 When I looked at the documentation that
4 came out for this package performance study, and the
5 modeling criteria to set up what kind of tests are
6 going to be done, and the question that came to me is
7 it looks like, or at least the conclusion that I began
8 to reach was it looks like we are trying to figure out
9 what answer we want to get so that we can ask the
10 right question.

11 And I really would like to say that that
12 is not the way good science ought to work, at least in
13 my experience in the science community is not to do it
14 that way.

15 And it is not a way in which it is going
16 to instill confidence or safety, which I think is more
17 important. I think that Fred's point is very
18 important. It should be about safety, and confidence
19 will follow from that.

20 And so I really would like to underscore
21 the bias, the potential bias that might be going into
22 this testing program, and that we really ought to be
23 clear about what we are trying to achieve.

24 I think it is really important that we
25 challenge, always challenge what we have out there,

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1 and so we can find the parameters, the limits, of
2 safety. It is absolutely important.

3 And I would like to also underscore that
4 I think that the reason that we need to go way out of
5 our way in this particular case is because the nature
6 of the hazard is extreme.

7 We are not talking about bubble gum here,
8 and we all know that. But is hard for the average
9 person, it is hard to understand the level of
10 radioactivity that exists in these materials, and that
11 is why we have to be extremely, extremely careful, and
12 extremely, extremely safe.

13 So I would like to underscore that part of
14 it. I would also like to note that there was a
15 comment made earlier about reasonable expectation of
16 use. I think it is vital that whatever tests are done
17 may be done on containers that either are in use or
18 definitely will be in use. Let's be real clear about
19 that.

20 This program -- and it is good that the
21 public process is happening now, but in terms of the
22 testing, it may be a little bit -- to some extent it
23 may be premature until we know exactly what we are
24 going to be using.

25 Certainly it is a waste of resources to go

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1 through a testing procedure and that cask does not end
2 up being used very much. Like I said, the GA-4 is a
3 good example. I mean, it is all on paper.

4 It has been licensed and everything and it
5 is all on paper. Is it really going to be used for
6 Yucca Mountain, or is it going to be used later, and
7 is it going to be used for transportation?

8 I think we really need to be clear that we
9 are testing the right thing here as testing goes.
10 Certainly Citizen Alert supports test to failure, of
11 course, naturally, and we need to know the parameters
12 of what you are dealing with.

13 To me, I don't understand why people don't
14 understand that. It seems pretty straightforward.
15 And there was also a question about how long should
16 the fire test be. Until it fails. It is very simple,
17 and the same answer, and the same question, and until
18 it breaches.

19 And I don't think that this will undermine
20 the confidence issue. What it is showing is that the
21 NRC wants to find out the answers. Like John Wells
22 pointed out, the public wants to know what it won't
23 do.

24 When you are building a bridge, you want
25 to know what it won't do. You don't want the trucks

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1 falling into the river, and you don't want people
2 falling into the river. That is just good
3 engineering, right? So I have made that point.

4 And again I do appreciate the opportunity
5 to be here, and I think that I also would like to
6 underscore Calvin's point about trust and it is very
7 important to go to the communities and do the
8 education, and be part of helping the public to
9 understand all aspects of what we are proposing here,
10 and that is all that I have for right now. Thank you.

11 FACILITATOR CAMERON: Thanks, John, and I
12 want to thank all of you, and let's break for lunch,
13 and we will try to get more copies of the Halstead-
14 Dilger paper for everybody.

15

16 (Whereupon, a luncheon recess was taken at 1:17
17 p.m.)

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

(2:51 p.m.)

1
2
3 FACILITATOR CAMERON: Okay. We will have
4 specific issues to discuss and we can get peoples'
5 reactions to that, and perhaps move through this
6 pretty efficiently.

7 I think that we needed to spend the time
8 that we did this morning to establish a foundation,
9 but I think we might be able to move more quickly.
10 The first thing we are going to do is talk about these
11 overarching issues category.

12 And I will go through the details on that
13 in a minute. Secondly, there is the general testing
14 issues discussion, and I think that probably will move
15 quickly.

16 We heard a lot of that already this
17 morning, in terms of the types of casks that should be
18 used, and Diane Nielson talked about we should use
19 used casks, and other people said to make sure that
20 you do the full-scale testing on any that might be
21 employed in shipping.

22 There was a further suggestion that any
23 cask that comes in for certification should go through
24 a full-scale testing. And then under those general
25 testing issues, I guess the type of tests might apply

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1 there. We heard emersion, puncture, air crash,
2 terrorism.

3 After we are done with the general testing
4 issues, we have the fire issues, and Amy Snyder, who
5 I will introduce at that time, is going to tee it up
6 for us, and then we have Chris Bajwa, who is going to
7 talk about the Baltimore Tunnel Fire.

8 And then we will go to impact testing, and
9 then we will see what else there is. I think we are
10 covering most of the issues that we had in the parking
11 lot.

12 There are two remaining that we have not
13 talked about, and we might want to do that at some
14 point. One is this relationship of the NUREG CR 6672
15 to the draft protocol. There may not be any
16 relationship. I don't know.

17 But it was a controversial issue this
18 morning, and so if we can address that. And then the
19 second one, several people asked me what is the time
20 frame for this program, and how do you imagine that
21 all being laid out, and in terms of overarching
22 issues, and this is my best stab at it, but there are
23 a lot of good issues raised, and this does not
24 necessarily have everything on it.

25 But there were a lot of questions about

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1 what is the NRC trying to accomplish with this plan,
2 or perhaps a better question for all of you is what
3 should the NRC be trying to accomplish with this draft
4 test protocol.

5 Some of the things that I heard about what
6 we should be trying to accomplish is adequacy of the
7 regulatory framework, sufficiency of the models that
8 are used for certification. I used the word
9 sufficiency purposely to avoid the validation and
10 verification, and benchmark labels that we have here.

11 We heard the term extra regulatory, and I
12 don't know if that was Tom who raised that point, or
13 whether it was John, but what do people mean when they
14 say extra regulatory.

15 Does that coincide with this public
16 confidence issue? And on public confidence, we had a
17 lot of questions about what does public confidence
18 mean. Mike Baughman raised the issue about what is
19 the relationship to health and safety.

20 And it is very clear that public
21 confidence has two components to it. One comes from
22 the -- is related to the substantive results of the
23 tests themselves, but there is also a big process
24 component.

25 And we heard a lot about process. Calvin

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1 talked about education, and there was a lot of
2 discussion about that we need to have a better
3 description in the draft test protocol about what we
4 are doing to try to make it accessible.

5 I mean, you can't change science or
6 engineering, but you can try to explain it, and put it
7 into context, and just think of the phrase, shock
8 absorbers, and that is a useful way to explain that.

9 Someone said -- we had Kalynda and I don't
10 know whether Kalynda was the one who used the phrase
11 that we need non-expert public opinion, or whether it
12 was Bonnie who talked about that.

13 And then Diane's point that we should
14 explain what we did not do also. So there is a whole
15 slew of process issues connected to this public
16 confidence. And then I guess when you get through
17 that and given those objectives, what do you need to
18 do to achieve those objectives.

19 Do you need full-scale testing, or do you
20 need testing to failure, and then we might want to try
21 to put this in context. What is the relationship of
22 testing to failure, to full-scale testing. Someone
23 else talked about to use real world conditions. Is
24 that another way of saying that you don't test to
25 failure?

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1 What will the NRC do with the outcomes,
2 and is it cost beneficial. Is it worth it. So I
3 guess with that, I would ask that before we get into
4 a discussion, do any of you around the table, do any
5 of you have any comments? I mean, is this a useful
6 way to proceed to try to address these issues?
7 Kalynda. Just from an organizational standpoint.

8 MS. TILGES: I believe that if the
9 questions are posed, then they need to be addressed.

10 FACILITATOR CAMERON: Okay. Anybody else
11 have a comment before we get started discussing the
12 overarching issues? And I think that some of you may
13 have read the paper that Fred Dilger and Bob Halstead
14 prepared that has an alternative regime in it.

15 Well, I was hoping that when we get to the
16 various parts of that regime that they will be here to
17 tell us a little bit about that. Is the NRC
18 objectives correct?

19 Does anybody want to talk about what the
20 objectives of the test should or should not be? I
21 guess that is the best way to start off, is that some
22 of you might not want public confidence to be an
23 objective.

24 And maybe I will pick on Mike, and go back
25 and start with him. Mike, could you talk about what

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1 you were talking about this morning when you were
2 asking about the relationship that public health and
3 safety to public confidence.

4 And you mentioned at one point that
5 because of the uncertainty that might come out of the
6 results that it could actually reduce public
7 confidence, but let's talk about what should the
8 objectives -- what do you think the objectives of this
9 test plan should be. Mike.

10 MR. BAUGHMAN: Well, I guess I do not
11 accept the premise that this work will contribute to
12 an increase in public confidence or will increase
13 public confidence. And I think that is a premise that
14 the NRC and Sandia are operating under.

15 And I would use as an example even the
16 statements that have been made around the table and by
17 members of the audience, and I quote, to instill
18 safety and public confidence will follow.

19 I don't know the numbers exactly, but I
20 think the DOE folks could suggest to us, or maybe
21 EPRI, that we have had maybe a few thousand successful
22 shipments. And 3,000 is what I am hearing down the
23 table. So, 3,000 shipments without an accident, and
24 without a release, and without a fatality.

25 And I don't know whether that represents

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1 safety or not, but clearly the public is not confident
2 in the safety of shipping nuclear waste. So that begs
3 the question that if we do these studies, which are
4 merely just studies, and it is not real life
5 experience.

6 It is just some models, and doing models,
7 and dropping a cask, how will that instill a greater
8 level of public confidence in the safety of nuclear
9 waste transportation. So I challenge the premise.

10 And if you were to reject that premise and
11 just move forward, I do think there is merit in doing
12 the technical studies. There is obviously concern
13 about whether the certification envelope right now
14 encompasses the full range of impacts or accidents
15 that might be addressed.

16 That suggests regulatory reforms, and so
17 as you have indicated, you are open to that perhaps.
18 I think that during this work to be sure that we are
19 actually certifying casks on an appropriate basis
20 makes some sense.

21 Whether ultimately that leaves to public
22 confidence or not, I don't think that should be a
23 concern to the NRC. Focus on public safety, and I
24 doubt that you are going to win the public over, and
25 at least the public is represented by a lot of the

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1 stakeholders in this room today. But you will have
2 safer casks.

3 FACILITATOR CAMERON: Okay. And let me
4 ask you some questions about that, and then I want to
5 go over to Bob and others. It seems like what you are
6 saying is that full-scale testing, no matter which way
7 you do it, and no matter how you do it, is not going
8 to increase public confidence.

9 But that full-scale testing would be
10 useful to confirming aspects of the regulatory
11 framework, either the rules, or the models that are
12 used for certification.

13 And I guess the big question then is in
14 what significant ways would, if any, would you suggest
15 changing the testing program if our goal was going to
16 be solely regulatory framework rather than an increase
17 in public confidence?

18 You might be saying let's not make a big
19 deal of this public confidence business, except for
20 perhaps a process aspect. And, Bob, if you are
21 listening to this, I want to get some of your feedback
22 after you hear what Mike says.

23 MR. BAUGHMAN: Well, I guess I would start
24 with that we have a task one in the protocol which
25 talks about collecting current data on accident

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1 history, for example.

2 I found it a little bit disturbing that
3 that was kind of pushed off to the side, and that you
4 are going to talk about that later. It is not
5 addressed in this document.

6 From my perspective that Task One, which
7 is the active history is what informs the design of
8 the testing protocols that are laid out for Tasks 2
9 and 3 as I recall. And I think that is where Bob is
10 coming from.

11 And that is where the Baltimore Tunnel
12 experience is coming from, is that these real life
13 accidents aren't forming the testing envelope that we
14 should perhaps use, and so I guess I -- well, I can't
15 remember what the question was.

16 But I do think that we need to design a
17 test protocol which perhaps captures a broader range
18 of real life accidents. Whether those accidents cause
19 a greater or lesser risk, I don't know.

20 But if you find that your analytical
21 models don't respond properly to those real life
22 accident scenarios, then it does suggest to me that
23 maybe those models need to be revised, and maybe the
24 regulations need to be revised to be sure that we are
25 using a more robust model.

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1 None of that has anything to do with
2 public confidence in my mind.

3 FACILITATOR CAMERON: Okay. Bob and
4 Diane, all of you have been listening to this. We are
5 looking at what should be the objectives of the test
6 protocols.

7 And, Bob, you made a comment before that
8 the State of Nevada and Clark County believes that
9 full-scale testing is the most important spent fuel
10 transportation issue. How do you feel about what the
11 objectives as a test should be?

12 MR. HALSTEAD: Well, so that you know that
13 this fishing tie that I am wearing was a tie that I
14 always wore when I was going to debate Bob Jefferson
15 about cask testing, because we often get to a point
16 where -- and Bob was the guy who masterminded the
17 Sandia tests in the '70s, but sometimes we could not
18 agree on anything but to have a discussion about the
19 relative merits of a Oriole Coachman Tight Streamer
20 (phonetic) on a Number 8 Carlisle Hook, versus a Bud
21 Minlow (phonetic).

22 So this has been going on for a long time,
23 and so I will start by saying that while I don't
24 change my position on testing, I really agree with a
25 lot of what Mike has said.

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1 And I have said this to many people in
2 Nevada that one of my concerns is that we might
3 succeed in getting our cask testing program through,
4 and getting all of the best available control
5 technologies, and best engineering judgment, extra
6 regulatory safety protocols, and still not have a
7 measurable impact on public confidence because public
8 confidence is undermined by a lot of other things that
9 we don't directly address here.

10 And on the other hand, I think there
11 probably was a major benefit to public confidence
12 because of the full-scale testing with the TRUPACTs in
13 New Mexico, and Jim might want to add to that later.

14 And I think that bizarrely the obverse is
15 clearly true; that by continuing to oppose full-scale
16 testing, you erode any public confidence that you
17 have, and it really comes down in my mind to the fact
18 that there is only one good argument against full-
19 scale testing, and it is costs.

20 And when you actually look at the costs,
21 the costs aren't that good. Now, one of the things
22 that we talked about last time was some things that we
23 were going to add to the record, and I have brought a
24 copy of the 1993 Sandia staff paper that was done I
25 think for DOE, Ken, if I am not mistaken.

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1 And it really just brilliantly shows the
2 advantages and disadvantages of scale model versus
3 scale model. Here is our short list of reasons for --

4 FACILITATOR CAMERON: Did you say scale
5 model versus scale model?

6 MR. HALSTEAD: The only advantage of scale
7 model testing is costs, and it doesn't always work out
8 that way anyway, because when you have a half-scale
9 physical model by Buckingham, it causes one accorded
10 by weight, and if you go any smaller, things like your
11 weld bolt seals may not be able to -- you may not be
12 able to accurately predict the scale performance.

13 And so usually the half-scale replicas is
14 about the smallest model that most people that I have
15 talked to have confidence in. And then when we had
16 some argument last week where, geeze, maybe Sandia was
17 wrong and you don't save that much money with a half-
18 scale replica. At least this was Alan's concern about
19 the Holtec.

20 Let me say that I think that the case for
21 full-scale testing for the new casks is maybe
22 different than if we were talking about the old casks.
23 First of all, we are talking about a truck cask and
24 four rail casks that might be used for PFS in Yucca
25 Mountain shipments that have not only never been used,

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1 they have never been built, with the exception as I
2 understand it of one Holtec OVERPACT.

3 So you are not talking about those tests
4 that have the 2 million shipment miles of experience.
5 Secondly, the new cask designs are very different from
6 past designs.

7 And I know there are trade-offs, and I
8 don't belabor this, but there are some very dangerous
9 not spent fuel is shipped to reprocessing facilities
10 in the old days, and now we are planning to ship
11 older, cooler, and less radioactive fuel, and we are
12 going to have an enormous increase, like a 4 to 6-fold
13 increase in the payload in each cask.

14 And some structural benefits are probably
15 lost with the reduction in shielding that is allowed
16 by inspecting these casks for 5-to-10 year old fuel
17 instead of 180 day cooled fuel.

18 So the cask designs are not only new ones,
19 but they are significantly different. There are all
20 kinds of innovations in materials, shielding
21 materials, lid closure details, and on top of this,
22 you are talking about an enormous increase in the
23 number of shipments.

24 And you have 40 times as much fuel, more
25 or less, is going to be shipped each year as was

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1 shipped in the past; and 5 to 30 more times more
2 shipments depending on the mode. There is a big
3 increase in the average distance of a shipment, which
4 we think may have significant implications both for
5 equipment performance and human error.

6 And finally we have to look at the past
7 record of the casks. Now, you can look at these
8 statistics and not be very reassured that the
9 industry's record is 2,000 shipment miles -- I'm
10 sorry, 2 million shipment miles and four accidents,
11 and that is actually not a very good accident rate.

12 And that is kind of surprising, because
13 you would think with all of the special precautions
14 that the accident rate would be really good. And you
15 look at the accident rate for the WIPP shipments, and
16 it is like what, two in a million shipment miles?

17 AUDIENCE: No, 1-1/2.

18 MR. HALSTEAD: But it is still one
19 incident per million miles, and frankly the spooky one
20 is that if you go back and look at what is the
21 frequency of accidents that are with a particular
22 driver, it is one in 2 million shipment miles.

23 FACILITATOR CAMERON: Well, 1-1/2 million
24 miles was the answer to the question for the record.
25 He didn't get that.

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1 MR. HALSTEAD: For us it is a
2 determination of these reasons, and the cask design
3 issues, and the fact that frankly we are not that
4 impressed with the safety record.

5 And let me just put in the record two
6 things. I don't know if John Vincent is here today,
7 but John Vincent and Alan made two really good points
8 last week giving the industry perspective.

9 What Alan said was that you know that the
10 simpler the test the better, and one of the things
11 that we will talk about later is that I am not sure
12 that we can do some of the tests that are in the
13 testing protocol.

14 But I am pretty sure that we could do the
15 regulatory tests and instrument it, and use that
16 information benchmark codes, as well as secure
17 measured physical data on how the cask actually
18 performs.

19 Secondly, John Vincent from NEI made a
20 very good point. He said, you know, these accidents
21 that are in the regulations, the 30 mile impact with
22 the unyielding service, which is like a 50 to 60 mile
23 impact with a bridge abutment, followed by a half-hour
24 1475 degree fire and puncture.

25 You know, that is not the worse case

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1 accident, but it is a fairly severe accident by
2 anyone's standards. And so to say -- and I think you
3 should understand that it means something when people
4 from Nevada, who have spent 20 years doing all kinds
5 of accident studies, including 21 accidents we have
6 not had a response from, from Sandia that we think may
7 have seen those, for us to come to the table and say,
8 no, we are not sure about that fire standard, but
9 having looked at all of this accident data, we think
10 that hypothetical accident is a fairly severe
11 accident, and that is kind of the bottom line. That
12 is what we test the casks to.

13 And there I don't know that we have to do
14 a lot of expensive, full-scale testing to go beyond
15 that for the failure thresholds, and a complication
16 for us in the thermal is that our consultant, Merritt
17 Berkey, who has 37 years with NTSB, and NIST, has been
18 going over your reports and our reports, and has
19 suggested some different ways to approach the fire
20 test.

21 But the long and the short of it is that
22 we think that there is a case for full-scale testing,
23 and the only good case against it other than one that
24 Dave Stedeki (phonetic), a BMFL consultant for us told
25 us, that if you just do full-scale testing and take

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1 the computer simulations, these smart guys in the
2 fabricator shops are going to slip a prototype by you
3 that is structurally different than what they are
4 going to produce.

5 And I say with QA and QC, we can prevent
6 that by having an NRC inspector in the shop at all
7 times, and check the paper trail. So, I am
8 acknowledging that there is one good argument by a
9 cask designer against full-scale testing in one of our
10 reports.

11 I believe that the QA and QC throws that
12 out, and so I think costs is the only reason not to do
13 full-scale, and Mike's bottom line is this. If you do
14 it, it does not guarantee public confidence. But by
15 god, if you don't do it, I can guarantee you that it
16 will erode. That is all I am going to say.

17 FACILITATOR CAMERON: Just one
18 clarification. This term of extra-regulatory has been
19 used, and I don't know --

20 MR. HALSTEAD: We will get to that in the
21 technical testing, that definition today.

22 FACILITATOR CAMERON: But we are talking
23 about objectives here. Does anybody want to -- what
24 does extra regulatory mean? I mean, how many people
25 know? Around the table, who knows?

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1 MR. HALSTEAD: What it means to us is that
2 it means, for example, that instead of having the 30
3 mile per hour impact, you go with what you have
4 suggested in the testing protocols, a 60 to 90 mile
5 impact, but because you have an impact limiter in
6 there, that changes things.

7 And with the fire, you would increase the
8 time or the temperature.

9 FACILITATOR CAMERON: But extra-regulatory
10 is that you are not using that in terms of a specific
11 objective that you want to get out of the test stuff.

12 MR. HALSTEAD: Sure we are. We are saying
13 that the regulatory accident is spelled out in the
14 regulations, and it is a severe accident. And we want
15 to test the casks to see if they meet that. Frankly,
16 beyond that, you want to do failure analysis which may
17 or may not involve a lot of additional full-scale
18 testing.

19 And our feedback into the review of the
20 regulations then are the regulations that we are
21 testing to adequate.

22 FACILITATOR CAMERON: So extra regulatory
23 is tied -- and I am just trying to get this organized
24 in my mind, but extra regulatory is tied to testing to
25 failure, and we don't have to define that now. No?

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1 MR. HALSTEAD: That isn't, and that is
2 where there is a semantic problem.

3 FACILITATOR CAMERON: Okay.

4 MR. HALSTEAD: What I think can be useful
5 here is that what I think about Sandia's proposal is
6 an effort to design tests beyond what are in the
7 hypothetical accident in the regulations, and that are
8 severe enough to challenge containment, but they are
9 replicable tests, and reasonable tests, and they are
10 severe enough to benchmark the codes, but you have not
11 specifically chosen testing failure as an objective
12 for one reason or another.

13 And it is different for us to say that we
14 want to run the models, and predict where -- for
15 example, predict what internal temperature in the
16 field cladding of the cask causes one percent of the
17 Cesium 137 can be released with (inaudible) aerosol.
18 But that is a pretty good definition of a minimal
19 catastrophic impact.

20 Or we want to see what type of impact
21 would cause that MPC to breach. Probably it would
22 probably have to be that the MPC adds a lot of
23 strength there. So it is different.

24 FACILITATOR CAMERON: That was a great
25 explanation, and I think we are beginning to see some

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1 of the stages along the spectrum here. Let's go to
2 Diane, and Judy, and Kalynda, and come back over to
3 Jim these issues. Diane.

4 MS. NIELSON: Just a perception. I am
5 wondering if the word competence is a little bit like
6 impact limiters.

7 FACILITATOR CAMERON: Or shock absorbers.

8 MS. NIELSON: Yes, but I frequently listen
9 to the NRC meetings, and I appreciate what they are
10 saying, that they have confidence in the rules. I was
11 just thinking about the waste confidence rule, which
12 is another of those misnomers.

13 But to the extent of what you are looking
14 for is confidence from the public in the same sense
15 that you have confidence in the rules, or in the
16 protocols, or in some tests, I think Bob and Mike are
17 right. I think you are not going to get there.

18 And to the extent and to the process that
19 is helping the public to better understand what you
20 are trying to accomplish, I think this sort of a
21 mechanism -- the report, the discussions we are having
22 -- are helpful.

23 The last thing that I would want to see is
24 the NRC abandoning the idea that they should be trying
25 to make the public better understand what they are

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1 doing. I think the word confidence though is getting
2 in the way.

3 FACILITATOR CAMERON: Okay. So if we
4 think about competence, it seems like what you are
5 saying is, and I think the implication of what Mike
6 was saying is that if we are going to talk about
7 public confidence, it should be focused on the process
8 aspects.

9 MS. NIELSON: Well, focus on the results.
10 I think competence is an outcome and I think that
11 safety is an output.

12 FACILITATOR CAMERON: Okay. Thank you.
13 And we may go back to that. Judy.

14 MS. TREICHEL: Well, we always get back to
15 definitions, and somebody is talking about one thing,
16 and another person who is hearing it is thinking
17 something else.

18 And what does it mean when one of us
19 around this table becomes confident, and it means a
20 whole lot of different things. So I am not sure that
21 is a good word for this.

22 I may think -- and I am one of the
23 unconfident ones, and Mike Baughman will tell you that
24 anytime that you ask him, but I may truly believe that
25 you will make it to PFS from Excel in Minnesota. I

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1 may be willing to bet that you can make it there.

2 That would make me confident. Do I think
3 that PFS is a good idea? No. So it may be that I am
4 failing the test of confidence. So I think we should
5 throw that out. People become confident in doing
6 something for a whole lot of reasons, and generally
7 because they want to do it.

8 That's why you will see the NRC and DOE
9 around this table being absolutely confident in a lot
10 of things that they are talking about, because they
11 want to do it.

12 And that is why you will see the public,
13 particularly who opposes this, and particularly the
14 Native Americans who are really threatened more than
15 anybody else, lack confidence because it is a bigger
16 issue. So I think it is probably the wrong word.

17 But if you are lining up these tests, one
18 of the Federal Agencies that does a pretty good job,
19 and if it comes from me that is a really big deal, is
20 the National Transportation Safety Board.

21 Their analyses appear to me to be very,
22 very thorough, and open, and not swayed by others.
23 And I am wondering if the people who put together
24 these protocols have gone through and seen with NTSB
25 results from accidents that have happened, where you

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1 come by an accident on the street, and you are
2 wondering how in the world did that happen when you
3 see a rail car twisted like a pretzel.

4 But they find out how all of those things
5 happened, and so have their results been added in for
6 what is an accident that can happen in this situation
7 with this sized vehicle?

8 FACILITATOR CAMERON: Okay. Thanks, Judy,
9 and at some point I think we need to go to you, and
10 others, and you heard Bob's description of what the
11 difference is between extra regulatory tests and
12 testing to failure.

13 It is one bus stop so to speak before
14 testing to failure. We have heard some of you saying
15 test the failure, and I guess I would like to get some
16 reaction to what you heard Bob propose, and is that --
17 in your mind is that something that is acceptable.

18 But let's go to Kalynda, and over to Jim,
19 before we do that.

20 MS. TILGES: Kalynda Tilges, Shundahai
21 Network. To my mind, extra regulatory means above and
22 beyond what the regulations call for. Now, given the
23 statements that I have made as far as Shundahai's
24 position on this, I would like to get to a position on
25 the tests that are done and that are not extra

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1 regulatory, but all of these testing failures, and
2 random selections from all casks that need to be
3 licensed, that that would end up becoming regulations.

4 So that the very best test that we could
5 do for the public safety would not be extra
6 regulatory. That would just be a given as part of
7 what is done. I for one am sick to death of just
8 having a bare minimum done by law, and I am sick to
9 death of having costs as an influencing factor on the
10 safety of our children, and our future, and our
11 environment.

12 And there is no amount of money that could
13 pay for the loss of my child, or anyone else's child.
14 And so money being the bottom line factor, I think is
15 obscene.

16 And talking about public confidence, I
17 think it is more a matter of public trust, and how do
18 you get to public trust. I think that involves being
19 completely open and completely honest, and for the
20 public to eventually find out that the Nuclear
21 Regulatory Commission, or any other agency for that
22 matter, is willing to go whatever distance it takes to
23 involve the public in these matters.

24 And to do everything in their power to
25 make sure that the public feels that they are safe.

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1 Confidence, like Judy said, is kind of an arbitrary
2 term. But at this point I can tell you that the
3 public has no trust, and until they trust you, and
4 until you prove that you can be trusted, there will be
5 no confidence.

6 FACILITATOR CAMERON: Jim.

7 MR. CHANNELL: Well, I want to agree
8 largely with Bob about what he said about full-scale,
9 the hypothetical accident condition test and then the
10 regulations. I really believe that doing those is one
11 thing that will help with confidence.

12 It will as Bob says, it will keep you from
13 a growing confidence. I think that has been a very
14 important factor. So I think that this should be done
15 as a basic on all the new casks that we are talking
16 about.

17 I believe that the proposed tests that you
18 are doing will be very useful for two reasons; for
19 checking the codes, and also to give us some data
20 points to use in our risk analysis for the lower
21 probability accidents.

22 And as confidence is concerned, it may or
23 may not help. And I think that the 75 miles per hour
24 impact test is probably reasonable, because you
25 clearly expect something to happen, but you don't

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1 expect it will be a really complete failure.

2 You may get some surprising results, and
3 if you get some surprising results in those, it could
4 help confidence. But if you don't, then you might
5 have a lot of explaining to do. So I don't think that
6 confidence should be the reason to do it, but I think
7 you should do it.

8 FACILITATOR CAMERON: Okay. Great. I
9 think that has been a useful discussion on this issue
10 and putting it into perspective. Do we need to talk
11 more about whether the testing should be done to
12 failure, as opposed to testing that goes beyond what
13 the present regulatory scheme is based on?

14 I am going back to Bob's description of
15 that. Kalynda, I think, clearly indicated testing to
16 failure, and do we need to define that? I mean, how
17 much -- and why you talk on that issue, okay?

18 MR. KESSLER: Again, failure probably
19 means different things to different people. The way
20 my understanding is of how industry uses it is what
21 you are trying to protect is what we call the primary
22 barrier, and to try to make that into English, what we
23 are talking about is that you want to have a complete
24 envelope that you maintain around the used fuel that
25 you are shipping, and that is what we call the primary

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1 barrier.

2 In the case of the Holtec design, inside
3 there you have the MPC, the multipurpose canister.
4 That is the primary barrier. The cask is not the
5 primary barrier in that particular case.

6 So if you are going to talk about failure,
7 in terms of something that might lead to some sort of
8 potential release from spent fuel, that is what you
9 need to do.

10 My understanding is that the test instead
11 has been designed to cause leakage from the cask, but
12 not from this inner canister, at least for the case of
13 the rail cask. I am not quite sure of the truck cask.

14 Bob Halstead made a point earlier about
15 another potential failure could be a loss or
16 degradation of shielding as something that could cause
17 harm to the public, and certainly it could if you had
18 major loss of shielding in the wrong place, et cetera.

19 I guess I would say that as an industry we
20 are less concerned about that. We can certainly put
21 in temporary shielding and move things, but what is
22 more of concern is this maintaining of the envelope,
23 or the primary barrier around things. So in my mind
24 that is what failure is.

25 FACILITATOR CAMERON: And could you just

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1 restate again so that we can all get it, is that the
2 draft test protocol is not at least in terms of the
3 rail cask, is not focusing on the primary barrier.

4 MR. KESSLER: My read of what is in the
5 draft test protocol, and Ken can correct me since it
6 is his analysis, or Sandia's analysis anyway, is that
7 what they are looking at is a test that might cause
8 some bending of this task.

9 You know, permanent bending, and not just
10 this thing where it bounces back and it has a final
11 shape, or the plastic strain, using the technical
12 terms, of the cask.

13 Their analysis at least that they showed
14 and that they published for 75 miles an hour, showed
15 no plastic strain of the inner-canister for the rail
16 shipment, and that is what I am talking about. That
17 difference.

18 It sounds like what they are saying is
19 that failure is the yielding of the bolts that might
20 cause some sort of opening in the lid of the cask.

21 FACILITATOR CAMERON: Even though that
22 might not cause any breach of what you call the
23 primary barrier?

24 MR. KESSLER: Right. If the canister
25 stayed intact, it would not cause any breach. It

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1 would not cause any potential release of gases or
2 particular release of fuel, assuming that there were
3 any available.

4 FACILITATOR CAMERON: So I guess you might
5 -- and going back to public confidence again, is that
6 some people might argue that while you really want to
7 focus on that outside container, the cask, because
8 that would give the public more confidence that they
9 knew that that was going to be intact?

10 MR. KESSLER: Well, if it is a balancing
11 act that I view the NRC and Sandia trying to between
12 trying to gather data to help collaborate some of
13 these models in this plastic strain region, or this
14 idea when you actually have permanent deformation of
15 something afterwards, versus what gains public
16 confidence, certainly their analysis suggests that
17 they are going to get some permanent deformation of
18 the cask.

19 And if that is what they are after, this
20 proposed test would probably get them some. Regarding
21 the latter, I can't tell you what it will get them.

22 FACILITATOR CAMERON: All right. Thank
23 you. Thank you, John. Fred.

24 MR. DILGER: Fred Dilger, Clark County.
25 I have just two comments to make. The first is -- and

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1 I hate to make it a little bit more complicated, but
2 we are going to have to talk about the complexities of
3 a loss of shielding, versus a loss of containment, as
4 a failure problem.

5 And speaking as a local government
6 representative, in the event of an accident, the first
7 responders are going to be local government folks, and
8 there are going to be State Government folks who
9 arrive on the scene, and knowing, and using your
10 computer models, what kind or being able to estimate
11 what kinds of tactics that might be necessary upon
12 arriving in an accident scene like this will be very
13 helpful.

14 If we have a loss of shielding event, that
15 might dictate a different set of tactics than if we
16 have a loss of containment event. So we have -- there
17 are a couple of different ways to fail is the bottom
18 line.

19 And I wanted to just resurrect Dr. Solar's
20 (phonetic) definition of failure last week as an open
21 pathway to the environment, and that is one way that
22 we might want to start as a straw-man to begin the
23 discussion about failure.

24 FACILITATOR CAMERON: And can you just
25 clarify. You used the term shielding and

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1 containment, and we heard about the primary barrier,
2 and the MPC, versus the cask. Does shielding equate
3 to -- and containment equates to -- what?

4 MR. DILGER: I think that you had better
5 get a better definition, a more formal definition from
6 some of the other folks around the table. But
7 shielding would mean that we would -- that there would
8 be a greater output of radiation from the container
9 than from an intact container.

10 And perhaps something that would exceed
11 regulatory limits, but a loss of containment would be
12 a failure to contain the cesium and the other highly
13 radioactive particulates that are in the fuel rod
14 itself.

15 FACILITATOR CAMERON: Okay. Judy.

16 MS. TREICHEL: Just as a follow-up, and I
17 asked a version of this before. But isn't it possible
18 that you would be shipping uncanistered fuel and that
19 you may be shipping it by rail in a large rail cask,
20 and uncanistered, I am assuming, would be no MPC.

21 Aren't there going to be situations where
22 you would be shipping something that does not have
23 this inner-thing, and therefore a failure of the outer
24 shell or the overpack would be your failure?

25 MR. BRACH: One, there are some casks that

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1 are authorized for transport by road or rail that are
2 not multi-purpose canister type casks. The reason in
3 our package performance study for selecting the Holtec
4 cask design, and also for looking at casks of a more
5 modern contemporary design, is that we envision that
6 if a shipper is going to be using rail that they would
7 be looking to maximize the cask loading and minimize
8 the number of shipments.

9 And that would typically then be the
10 current design of what we call dual-purpose casks,
11 which are multi-purpose canister type cask designs.
12 So the answer to your question is, yes, there are
13 different types of casks, and some have canisters and
14 some do not.

15 But what we are envisioning, and for
16 example using PFS for the proposed facility, envisions
17 shipping Holtec casks, which is a multi-purpose
18 canister cask, as well as the more current and
19 contemporary spent fuel casks of current design that
20 have larger loadings if you will of spent fuel in the
21 canister, are all multi-purpose canister designs.

22 MS. TREICHEL: And you don't require that
23 they are in MPCs? If somebody has canister fuel, and
24 they want to ship it not to PFC, or to Yucca Mountain,
25 but they need to transfer it from one utility to

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1 another, and they need to for some reason, like a TMI
2 accident or whatever, you do not require that it be in
3 an MPC in order to be on a rail carrier?

4 MR. BRACH: That is correct. The casks
5 that you are describing are casks that have fairly
6 smaller contents, but yes, that's correct.

7 FACILITATOR CAMERON: Let's go to Peggy,
8 and then we will go to Bob, and then maybe we will
9 move to general testing issues. Peggy.

10 MS. JOHNSON: Just a point of
11 clarification. Is that the cask that you all have
12 chosen, because it is sounding like that to me when
13 you are saying that the reason that we have chosen.
14 I mean, is that a done deal is what I am asking.

15 MR. BRACH: No. No final decisions have
16 been made on the PFS study, and the types of tests,
17 and the types of casks, and the number of casks. That
18 is the purpose of this discussion today, and the
19 comment period that we are in right now is to ask for
20 comments from you and others on recommendations in
21 regard to the type of cask, the number of casks, and
22 the type of tests and conditions, and parameters.

23 MS. TREICHEL: Then we are getting back to
24 confidence and trust again, because it sounds to me
25 like you have made that decision in the terms that you

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1 are using, and I think that needs to be really clear.

2 MR. BRACH: Let me apologize for that.
3 What I mentioned was that in our draft test protocol
4 we have identified two candidate casks, a rail cask
5 and a road cask, for testing. And the reasons for
6 selecting the rail cask, the Holtec cask, was that we
7 were picking a cask of current and more recent design
8 that has a larger loading.

9 That is, number of spent fuel assemblies
10 that can be transported in that canister, compared to
11 some of the older if you will cask designs that have
12 markedly fewer assemblies authorized per shipment, or
13 per cask loading.

14 But whether it be a Holtec or another
15 vendor's design, there is no selection there. I
16 believe Ken or Andy had mentioned in earlier comments
17 this morning that in our development of the draft test
18 protocol and in trying to describe some of the if you
19 will test summaries and analyses, we had to pick a
20 candidate design to facilitate the modern analysis.

21 And if you will recall some of the
22 overheads showed some of the visual impact on the
23 center of gravity. For example, impact tests, and
24 showed the velocities and the G-forces that would be
25 exhibited.

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1 We had to pick a cask design if you will
2 for our presentation purposes to represent the type of
3 impact and power tests that we were considering.

4 FACILITATOR CAMERON: Okay. Bill, did you
5 have some other points before we go to Bob?

6 MR. BRACH: Well, I did not want to
7 belabor the issue on testing to failure, but I just
8 wanted to put on the table one aspect of testing to
9 failure, and which I think is important to be included
10 in the overall consideration, is a comment that Bob
11 Halstead made earlier about real life accidents.

12 And I would just offer that in
13 consideration of testing to failure, I think another
14 aspect that needs to be considered in that same type
15 of discussion is the realism of the testing scenarios.

16 Andy Murphy this morning had mentioned
17 that, for example, the 75 mile per hour impact test,
18 with a casking being dropped on to an unyielding
19 surface is roughly equivalent to an impact speed of
20 about 150 miles per hour.

21 And I only put that into the context as we
22 are considering what might be real life accident
23 scenarios or conditions, and as we are talking about
24 testing to failure, I think that those considerations
25 need to be collectively assessed as they are trying to

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1 determine what testing and what failure mechanisms we
2 are looking at and actually trying to envision in a
3 test.

4 FACILITATOR CAMERON: Okay. Thanks, Bill.
5 Let's go to Bob and maybe discuss some of these
6 general testing issues, and check in with the
7 audience, and then go to the fire aspect. Bob.

8 MR. HALSTEAD: Let me first comment on
9 Bill's comments, which I think are well considered
10 about what are the real world accident parameters that
11 we are looking at.

12 Understand that in Nevada that we look at
13 this differently than you look at it nationally,
14 because we have some unique local conditions, and
15 because of the presence of certain types of military
16 operations, the Hawthorne Weapons Facility, and the
17 Nellis ranges, for example, we unfortunately have real
18 world experience with both truck and rail accidents
19 involving military munitions.

20 Secondly, I dare say that we have done
21 more research on them than your folks have done. So
22 we have looked at all of the accidents that have
23 occurred around the country, and with craters the size
24 of this room for the horrific 1973 rail accident of
25 military explosives in Marysville, California.

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1 So looking at our unique local conditions,
2 some of which reflect this issue at PFS -- and, for
3 example, I personally believe having looked at the
4 analyses that a jet aircraft hitting a cask has some
5 possibility of causing a small release either because
6 of the fuel loading or the impact of the jet rotor
7 turbine loader.

8 But what has not been evaluated is what
9 happens if there is even live ordinance that somehow
10 explodes, despite the fact that it is not supposed to
11 explode.

12 Or if a plane is carrying an MK-1000 dummy
13 bomb, which is basically cement in a shield, or a
14 steel sheaf traveling at 400 or 500 miles per hour,
15 that is an awfully good penetrator.

16 And so there are some unique local
17 conditions that affect transport in Nevada that we
18 don't think are enveloped either by the regulations or
19 by what is in 6672.

20 That said, the real issue that I think
21 that we might resolve here is this issue of how these
22 elements like the MPC affect containment. Part of our
23 reason for asking that all the casks that might be
24 used for future shipments be tested is precisely
25 because there is great uncertainty about those cask

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1 designs.

2 And though the welded MPC in the Holtec
3 cask, and pardon me as I know that this sounds like
4 just jargon being driven, you need to understand that
5 we are trying to talk in shorthand so that we are not
6 here until midnight tonight.

7 PFS is going to receive fuel and not
8 handle it, and so having a welded canister as part of
9 their systems approach makes perfect sense. DOE has
10 said on the other hand that they are considering doing
11 a lot of things at the surface facilities, like fuel
12 blending, possibly doing random fuel inspections.

13 So if they have an MPC in a rail cask,
14 they have discussed in the past having a bolted
15 closure. Other issues involve the lack of rail access
16 and the difficulty of rail access, I know that people
17 don't want to hear it, but believe you me, I am
18 looking forward to spending the next 5 or 10 years
19 debating a NEPA process if DOE's project goes forward
20 on rail access.

21 It is not going to be easy to build a
22 railway, and even if you do, it is still possible that
23 about a third of the inventory will come from those 24
24 difficult to access reactor sites.

25 So you may still have a lot of truck

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1 casks, who as far as I know, none of whom, unless they
2 have damaged fuel, are planning to use a welded
3 canister inside.

4 So the way that you deal with that is by
5 doing the regulatory tests on all the cask types and
6 then you capture those issues. And frankly I just
7 want to say for the record that Nevada endorsed the
8 DOE MPC proposal back in the mid-1990s, partly because
9 we thought that welded canister ought to be required
10 by regulation.

11 And we were convinced that it added a lot
12 of protection, and that if it caused problems opening
13 the cask and doing fuel acceptance at the repository,
14 then they would just have to find a way to accommodate
15 that.

16 But I think that it is important as you
17 finalize your protocol, and hopefully we are going to
18 have another discussion on this, that you realize that
19 that welded canister is a very important issue in
20 whatever testing is done, just as I believe having the
21 impact limiter on, or the assumptions that you make
22 about what type of neutron shield is on a cask, and
23 whether it is solid or water-jacket, and what degree
24 of damage you receive and so on.

25 But this really would be a good segue if

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1 we were going to technical casking. As an advocate of
2 full-scale testing, I will tell you that it is going
3 to be very difficult to do these tests.

4 And we are respectful of the task that
5 Sandia or other contractors may be charged with.

6 FACILITATOR CAMERON: Okay. Do we need to
7 -- how much do we need to discuss the general testing
8 issues? And, Bob, you are talking about a segue to
9 the specific technical issues, then I am assuming that
10 you mean the fire and impact issues.

11 How much do we go to types of casks, and
12 types of tests? Judy.

13 MS. TREICHEL: If you are talking about
14 doing a drop test and a fire test, and I am not sure
15 if your tests will be expanded to do anything else,
16 but under current certification do you consider
17 exterior things, like the quality of the
18 infrastructure, like the quality of the rails, the
19 huge rail casks would be coming across, or the
20 strength of the bridges, or the other systems?

21 Who is in charge of regulating that sort
22 of thing, and if people wanted to comment on that, is
23 that even within the scope of this?

24 MR. BRACH: Let me just answer the first
25 part of the question, and I will look to Rick Boyle

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1 from DOT on the rail and transportation aspects. The
2 NRC certificates, or the application that comes to the
3 NRC for a certificate for an NRC package is just for
4 the package.

5 For example, one of the schematics had a
6 picture of a Holtec, and the GA-4. The application
7 that the NRC would use, and would find acceptable if
8 we approve, is of the transportation package; and the
9 conveyance that goes on, and whether it be a truck or
10 a rail, and the upkeep and the quality with regard to
11 maintaining the status of the rail.

12 And I will stop there and yield to Rick
13 Boyle from DOT to address the rail and transportation
14 aspects.

15 MR. BOYLE: Yes, the Department of
16 Transportation does the safety of the infrastructure,
17 and in simple terms that means the Federal Highway
18 Department would go out and inspect the roads, and
19 make sure that they are built properly and maintained
20 properly.

21 And they could make comments as to what
22 could go on those and what cannot go on those. The
23 Federal Railroad Administration would work the same
24 way for railroads, as far as they have graded track,
25 and as to what weight limits and what speed

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1 restrictions there are for each type of track.

2 And they are not here today, and that
3 would be totally independent and that is a little bit
4 of the split between the Department of
5 Transportation's regulatory authority and the NRC's is
6 that they do the cask, and we do the actual transport
7 of it.

8 And the mode of conveyance, and inspecting
9 locomotives, and inspecting rail cars, and that is the
10 Department of Transportation.

11 FACILITATOR CAMERON: Okay. Thank you.
12 And, Judy, I am assuming that answers your question?

13 MS. TREICHEL: Yes, because I saw some of
14 the things on your list where you are talking about a
15 delay in shipping, and that would have nothing to do
16 with whether or not the cask is certified. It is just
17 going to be a parked certified cask and it wouldn't
18 have anything to do with whether or not you certified
19 it.

20 And so there are things on there that are
21 outside of --

22 FACILITATOR CAMERON: When you are
23 referring to a list, what are you --

24 MS. TREICHEL: Right there. Your
25 handwriting.

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1 FACILITATOR CAMERON: Oh, this is any --
2 in terms of the types of cask, I just was trying to
3 summarize what people had suggested. But any cask
4 that might be used in shipping waste.

5 Okay. We are going to get into fire and
6 I am going to ask Amy to cue that up in a minute, but
7 I wanted to see if there were any comments or
8 questions out here in the audience on the overarching
9 issues discussion that you heard or any of this. Are
10 there any questions or comments?

11 All right. Let's start with John, and
12 then we will work back that way. Oh, I'm sorry, let's
13 start over here.

14 MS. TRUMMEL: I am Candice Trummel, Nye
15 County Commissioner, and my question is with all of
16 this talk about testing to failure, why? Is it going
17 to change whether or not the cask gets certified, and
18 if it is not going to change whether or not it gets
19 certified, then why are we going to invest the money
20 to test when it is going to fail and give that
21 information out to possibly terrorists so that they
22 know exactly what they have to do in order to make the
23 cask fail. I just don't understand the purpose.

24 FACILITATOR CAMERON: Good question. Do
25 we have answers to that? I guess Bob and Fred do.

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1 Well, let's go to Bob, and then we will go to Fed.

2 MR. HALSTEAD: Well, let's focus this on
3 the fire, because that is the one that we studied them
4 most and have the greatest concern about. Yes, you
5 are right. There is a security issue here.

6 And it just does not deal with testing
7 cask vulnerability to things like anti-tank weapons,
8 but it has to do with the fact that you may have
9 terrorists or saboteurs attempting to cause a worst
10 case accident.

11 Now, I agree that that is a problem. On
12 the other hand, from my standpoint of advising the
13 State, I have a responsibility to try and evaluate
14 whether the existing regulations -- and, for example,
15 with the fire, encompass some reasonable level of what
16 a predictable worst case fire is.

17 To make this long story short, I have
18 absolutely no doubt that if we do an honest testing
19 program, and we find that there is a problem with the
20 fire test, one, I think it is very unlikely that the
21 NRC would not propose a rule making to address that.

22 And in the event that they did, it would
23 be extremely politically controversial, and I think
24 you would see the Congress stepping in. There is a
25 very -- and understand that we have a bipartisan

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1 delegation in Nevada, and believe you me, we talked to
2 their staff people last night, and they are all
3 following this with an unusual degree of attention to
4 detail.

5 And basically what they have said is that
6 they think that we should participate in this process
7 and see if it is possible to deal with these safety
8 issues without requiring new legislation.

9 But that is the point. I mean, I think in
10 fact Jim's point with the TRUPACT testing was -- and
11 I would even argue with the Sandia testing in the
12 '70s, and I would argue with the British testing in
13 the '80s, every time that honest full-scale testing
14 has been done, the test crew found things that were
15 essential to safety that they had not anticipated.

16 And in the British tests, you can argue
17 that the leak from the lid was below regulatory
18 concern, but my goodness, they went back and they
19 redesigned that lid to make it even better.

20 And in the case of the TRUPAC there were
21 a number of things, notably the O-Ring (phonetic), and
22 in the Sandia testing a whole body of knowledge about
23 the significance of the tie downs that attached the
24 truck cask to the truck trailer, and the necessity of
25 designing them so that they have the correct breakaway

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1 strength.

2 So I don't at all say that we won't learn
3 things from this testing, and we will end up changing
4 our standards. And I don't know that it will make the
5 public more confident, but I will have done my job in
6 advising the State about what makes good safety.

7 FACILITATOR CAMERON: The short answer is
8 that if indeed it might -- and I am not being
9 facetious, but indeed it might show some defect in the
10 regulatory framework.

11 MR. HALSTEAD: Absolutely.

12 FACILITATOR CAMERON: And let's hear from
13 Fred and then we will see if that answers your
14 question, Candice.

15 MR. DILGER: Two points on that. The
16 first is that I will go back to my comments about
17 first responders. About a year-and-a-half ago, a tire
18 came off -- and I think it was a bakery truck, and
19 caused an accident that caused -- I think it was a 2-
20 1/2 hour fire over on U.S. 95.

21 It was so hot and burned for so long that
22 it ruined the structural integrity of the Flamingo
23 overpass over U.S. 95. And that overpass had to be
24 reconstructed.

25 The reason that our firefighters didn't go

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1 in and put it out earlier and allowed it to burn out
2 was because they did not want to cause more damage by
3 using the flames or by using their foam to put that
4 fire out.

5 By testing to failure, I think that we
6 will learn something about where those thresholds are
7 that will be useful in the event of an accident. So
8 we will have some indication of what our tactics have
9 to be in the event of an incredibly severe accident.

10 So that is one aspect of that, and the
11 other one was a general testing issue that I didn't
12 bring up, and that I might have here, or that I will
13 hear, and that is that I do not see that there is that
14 much additional modular costs associated with testing
15 to failure.

16 As I talked to people who have tested
17 these things professionally, and who have been
18 associated with it before, as I understand it, for the
19 fire testing in particular, you dose the canister or
20 the cask in jet fuel, and then you light it up, and
21 then you have your monitors monitoring.

22 And so letting the actual cost of testing
23 that canister until there is an open pathway to the
24 environment, for example, as one definition of failure
25 is not actually all that great. It is extra fuel, and

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1 it is extra labor, and everybody has to work late that
2 night.

3 And it is running the computers a little
4 extra longer, and so I don't see that in the context
5 of doing full-scale regulatory casks, or testing like
6 this, I don't see that the costs would be that much
7 greater.

8 FACILITATOR CAMERON: Okay. Candice, does
9 that answer your question? All right. And, Fred, you
10 mentioned first responders a couple of times, and is
11 that something that the NRC should specifically factor
12 in in terms of what should come out of the tests?

13 MR. DILGER: I think no is the short
14 answer. I think that the NRC has the public safety or
15 has the obligation to protect public safety and they
16 should do that.

17 However, I think that testing like this
18 full-scale would generate knowledge that would be
19 useful to first-responders, and plotting our first-
20 responders, but I don't think that you should let the
21 fire department drive the train on how you test.

22 FACILITATOR CAMERON: All right. Thank
23 you. Yes, sir, can you just give us your name,
24 please?

25 MR. LEE: My name is David Lee. This is

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1 my first time being exposed to this type of public
2 meeting. I have a few comments. The first one is if
3 this test is going to cost \$20 million roughly, we
4 ought to spend the money more meaningfully by
5 discovering a few things.

6 And by designing the tests and restricting
7 it to 75 miles per hour, 30 minutes for 800 degrees,
8 we may already know the answer to the test, and
9 spending that \$20 million sounds to me like something
10 that is nothing more than a purely public relations
11 show.

12 And I think that is not the best way to
13 spend this \$20 million, and personally I hope that by
14 spending that \$20 million on at least 10 major
15 scientific discoveries may be lying there for us to
16 discover.

17 This morning I also heard a call to focus
18 on the issue, which is the types of test, and I want
19 to comment on that. Two types of tests that we know
20 of are railroad type and truck type.

21 Well, I propose that there is a third
22 type, and I call it crusty (phonetic) type. And I am
23 using an analogy of baseball. A good pitcher can
24 pitch a baseball at a speed of 80 or 90 miles per
25 hour, which is fine in excess of 75 miles.

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1 Incidentally, this morning I heard someone
2 say that 75 miles translates into the equivalent of
3 150 miles, and I do not think that there is any
4 scientific basis, because the non-yielding object has
5 zero speed, and therefore however you look at it,
6 there is nothing moving in a speed of 150 miles.

7 If you could double 75 miles by two, you
8 could call it a hundred miles, or 200 miles. I did
9 not understand that remark of 150 miles. My point is
10 that we probably know the outcome of the tests, and
11 that let's spend this money for something better.

12 And coming back to my remark about the
13 baseball. A baseball travels at 80 miles to 90 miles
14 per hour, and the batter swings the bat maybe 50 to 80
15 miles per hour, and that adds up to well over a
16 hundred miles per hour.

17 And that impact on the ball, there are
18 very few baseballs that would be broken, and that is
19 a real live test. Now, we know that 75 miles to me
20 was arbitrary, and probably the higher speed may be
21 called for.

22 And also incidentally the baseball has a
23 prosticity and some other scientific terminology if
24 formability was the issue. The physical principles
25 being used distribute the stress throughout the entire

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1 cask, and that appears to be one alternative that
2 ought to be studied so that this impact is not
3 confined to just one spot where the collision occurs.

4 And so offhand there is a third type, and
5 that the current study has not addressed, and I use
6 that as one example to make this comment. Thank you.

7 FACILITATOR CAMERON: Thank you, David.
8 There is a couple of people over here who wanted to
9 talk. Go ahead.

10 MR. AMMERMAN: Doug Ammerman, from Sandia
11 Labs. I have a couple of comments about probability.
12 One of the things that Bob talked about is an airplane
13 crashing into a cask. I don't know how many millions
14 of truck miles that are transported in Nevada per
15 year, but it is millions I'm sure, and probably
16 hundreds of millions.

17 And how often has a truck been impacted by
18 a crashing airplane? I have not seen anything in the
19 press about it happening, and so I would guess that
20 the answer is none. So the probability of an accident
21 is very small. It does not pass the rules for testing
22 that we are talking about for these packages.

23 And also today we had a comment about that
24 we didn't expect to see the Columbia fall out of the
25 sky. The probability of that accident is about 1 in

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1 100 of a failure of a space shuttle. If we don't
2 expect to see something happen in the probability of
3 1 in 100, why are we expecting to see something that
4 happens in a probability of one in a million or less
5 for the package performance study. Thank you.

6 FACILITATOR CAMERON: All right. Thank
7 you for bringing the probability issue up. Bob, I am
8 going to let you respond to that.

9 MR. HALSTEAD: Well, I would just know
10 that the Department of Energy thought that this was
11 such a serious issue that in their draft environmental
12 impact for the Yucca Mountain assessment in 1986, they
13 acknowledged that it was a unique local condition, and
14 that if it were a disqualifying factor, Yucca Mountain
15 would have been disqualified because of the potential
16 threat of aircraft overflights.

17 They later decided to address this in
18 their final EIS, where they -- and I don't remember
19 the exact probability, but if you will leave me your
20 card I will get it to you, but the way that they
21 addressed the issue was by saying, well, it could
22 happen, and it is credible and we have to look at it,
23 but the impact would not be sufficient to cause major
24 damage to the cask, both because of the fuel loading,
25 and because the aircraft is essentially a soft-body

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1 object, with a few exceptions.

2 And unfortunately they left out the fact
3 that many of the airplanes flying on training
4 missions, particularly at the Nellis range on both the
5 northside of -- well, in the Green Lake area and in
6 the Indian Springs area, are aircraft that are both
7 carrying live munitions and dummy bombs, which are
8 such good penetrators.

9 And. Diane, you may want to speak to this,
10 but my understanding is that a major issue for the PFS
11 license denial, permit denial, was the demonstrated
12 ability of these dummy bombs to be used to take out
13 Iraqi Radar Stations in situations where you want to
14 smash up a structure without putting a lot of shrapnel
15 out that kills a lot of people.

16 So I dispute your contention that this
17 isn't something that we need to worry about. There is
18 a straightforward way to deal with it, and so far the
19 Department of Energy hasn't chosen to deal with it.

20 Now, whether it is a concern to the NRC,
21 we would find out in licensing, but I think it is very
22 significant that yesterday the whole future of the PFS
23 storage facility in Utah was thrown into question by
24 exactly this issue of the probability of an aircraft
25 impact.

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1 Now, it is true that they were primarily
2 talking about impacts with stationary casks, but it is
3 a very significant issue in our minds.

4 FACILITATOR CAMERON: Okay. Thanks, Bob.
5 Kalynda, did you want to say anything in response to
6 that?

7 MS. TILGES: Absolutely. I also reject
8 your contention. Let's go back to low probability
9 accidents of the Titanic, the Exxon Valdez, the
10 Challenger, and the Columbia. Now, I am curious as to
11 -- and I realize that those were low probabilities,
12 but they are listed as some of the greatest disasters
13 in our history.

14 And I am curious as to how many of those
15 deaths were acceptable in our eyes, and we are talking
16 about the safety of the American public. Then if
17 there is any possibility whatsoever, this government
18 has to address that, and has to make this public feel
19 like they are safe.

20 But one of the problems is that it is not
21 just this mistrust of the DOE, or the NRC. I see in
22 this country the overall mistrust of our government.
23 And I don't see our government doing anything to
24 relieve those fears.

25 The public, I don't think, feels that any

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1 of those deaths, or any of the deaths of their
2 children, or their relatives, are acceptable. And
3 again when I say if there is any possibility
4 whatsoever, then we have to do our very best to make
5 sure that that doesn't happen.

6 I realize that nothing is a hundred
7 percent, but at the same time we should not be glib
8 about who is expendable. Thank you.

9 FACILITATOR CAMERON: Okay. Let's go to
10 John. John, do you have a question or a comment?

11 MR. HADDER: Yes. John Hadder, Citizen
12 Alert. I wanted to make a couple of comments about
13 the discussion of overarching incompetence and so
14 forth. Confidence, at least in the minds of Nevada,
15 since I have been working with Citizen Alert, is
16 something that is earned, and something that gets
17 lost.

18 And over the years, I think that the
19 Department of Energy has really faced this issue with
20 the Yucca Mountain project and also with the Nevada
21 Test Site with confidence lost.

22 And so I think that as a goal, I don't
23 think the NRC should really look at public confidence
24 as a goal for this, but if you follow a good process,
25 and you do the testing complete, and sort of in the

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1 format that Bob Halstead and Fred Dilger had outlined,
2 you would begin to earn that trust over time.

3 Time will tell, and I don't think that
4 there is any one thing that you are going to be able
5 to do in the short term that is going to give you that
6 trust. It just is not going to happen.

7 But over time if the proper procedures are
8 followed, and if these casks are tested, and if all
9 casks are tested that will be used, then over time the
10 public will begin to say, okay, I guess they are
11 looking after our safety.

12 That is my perception anyway since working
13 at Citizen Alert. So do it right and do it complete,
14 and up front, and eventually you may get that
15 confidence back.

16 I think that it is also important that the
17 issue of real world accidents be addressed as part of
18 this as well. One of the things that we get a lot of
19 is, well, how do these casks stand up to this, this,
20 and this scenario.

21 And so I think that it is important in the
22 process that the tests that you do connect and that
23 you try to draw those lines. Make those connections
24 between what are the kinds of things that are out
25 there and the routine, and the credible, and the

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1 severe credible, all those possibilities.

2 And we will be discussing this Baltimore
3 Tunnel fire soon, and I am sure that is one of them,
4 but a lot of times there can be situations where the
5 casks may experience multiple percussive events if on
6 a derailment and a railroad track that goes along a
7 canyon wall or something.

8 And I believe that one of the
9 transportation routes in the Yucca Mountain project
10 goes through the Rocky Mountains, and I believe there
11 are several stretches there along fairly steep
12 embankments.

13 And so that is another issue and the cask
14 testing involves a single impact, and we are talking
15 about multiple impacts, and what happens there. Can
16 you create lines between the testing that you want to
17 do and these accidents, and can you create lines
18 between these railroad accidents and the licensing
19 requirements.

20 Can you make those lines and can you make
21 the connection, and can you make that connection also
22 with your models that you use also. So I think it is
23 really important for what the public is asking for.

24 And so it needs to be real, and they have
25 to be viable, and they have to be accurate for the

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1 public to even believe it. In terms of some of the
2 probabilities, I think that the problems with
3 discussions around terrorism is that you can't
4 calculate probabilities.

5 We don't really have the numerics to do
6 that in general. If we did, well, we probably could
7 apprehend some of these things before they happen. I
8 think the biggest factor in terms of the terrorism
9 issue with the casks has probably mostly to do with
10 the transportation scheme that we might be looking at,
11 especially with Yucca Mountain.

12 The vast number of miles and over an
13 enormous number of years, the repetition over weeks,
14 and that is probably where the major danger lies. In
15 some scenarios that I have heard about around
16 terrorism, using penetrating type weapons, it is
17 probably unlikely that you will be able to design a
18 cask that is feasible to transport and be able to
19 withstand that kind of armament.

20 That is probably just the reality of
21 moving this kind of waste, and that is a public
22 decision as to whether it is okay to move waste over
23 these long distances, knowing that that is out there,
24 and we may not be able to hopefully guard against it.

25 But I think that the distances are a

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1 critical issue there, and then I don't think that we
2 can really get a good probability on what is going to
3 happen there. So those are some comments about the
4 directions of this, and I think that it should be
5 pursued. Thank you.

6 FACILITATOR CAMERON: Okay. Thank you,
7 John. And we are going to move into the specifics of
8 the fire aspects of the test then. Amy Snyder is
9 going to tell us a little bit about that, and put the
10 Baltimore Tunnel fire presentation into the context of
11 the test protocol.

12 Amy is relatively new with the NRC. She
13 has now been with us since the year 2000, and she is
14 the project manager for the Spent Fuel Project Office,
15 Bill's office, on this draft test protocol.

16 Her previous work at the NRC was being the
17 project manager for the clean up of the West Valley
18 demonstration project. Before that, she worked
19 several years in the private sector as a health
20 physicist on decommissioning projects.

21 And she was an officer and still is, or
22 was an officer in the United States Air Force, and she
23 has a Masters in Health Physics from the University of
24 Cincinnati, and a Masters in Management from Wesley
25 College, and a Bachelors in Geological Sciences from

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1 the State University of New York. And with that, Amy,
2 tell us about fire.

3 MS. SNYDER: Good afternoon. The NRC
4 appreciates your participation in this workshop, and
5 I am glad to have the opportunity to discuss with you
6 this afternoon fire testing protocols.

7 An important part of the process of the
8 design testing involves an interpretation of the
9 relationship between potential radiological hazards
10 and real world severe accidents.

11 And in the NRC transportation studies, we
12 have done that, and we will continue to do this in the
13 future in package performance studies. In July of
14 2001, the Baltimore Tunnel fire occurred. The
15 Commission asked us to evaluate this regarding the
16 transportation of spent nuclear fuel.

17 We did that we are about to have an
18 important discussion about what we learned from that
19 evaluation, and how it compares to the package
20 performance test protocols.

21 The State of Nevada has also evaluated the
22 Baltimore Tunnel fire, and has drawn some conclusions.
23 The NRC plans to meet with the State of Nevada to
24 address or to discuss our findings and a date has not
25 yet been established for that.

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1 But before we discuss the Baltimore tunnel
2 fire, what I would like to do is to review with you
3 the staff's proposal for the fire testing. And then
4 Chris Bajwa will discuss the Baltimore tunnel fire.
5 Then we will have an opportunity to discuss or to open
6 it up for the workshop to talk about fire testing
7 issues.

8 You saw earlier this morning in Mr.
9 Sorenson's presentation where he talked about fire
10 testing, or what the process is that we are proposing,
11 and we went to this calorimeter to gather the
12 necessary background and information on fires, such as
13 temperatures and heat flux.

14 And then we use that to benchmark the fire
15 code that we will be using so that we can more
16 accurately monitor the fire. Our next step is that we
17 are going to introduce some monitoring to determine
18 the response of the cask to the fire environment, and
19 we will be making predictions.

20 Then we will do the tests and compare the
21 results. As I said, the staff prefers full-scale
22 testing of both rail and truck casks. And we actually
23 will be doing physical testing on rail certified
24 casks.

25 The staff believes that the fire should be

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1 a fully engulfed venue (inaudible), and as Andy Murphy
2 explained to you earlier this morning, a fully
3 engulfing fire is one that completely surrounds the
4 cask.

5 And the NRC is proposing that jet fuel be
6 used, a hydrocarbon fuel source. The staff proposes
7 to conduct the fire test for more than 30 minutes, and
8 in the test protocols, there is preliminary modeling
9 done from zero to sixty minutes, but an exact time to
10 the deviation of the fire test has not been based, and
11 we want to get your comments and input on that.

12 There are many ways in which fire testing
13 can be conducted, and we would like to know what you
14 think and how you would specifically answer these two
15 questions. The fire test as we will discuss in the
16 test protocols, we will examine changes in temperature
17 and heat flux. What should the duration of the cask
18 test be.

19 And you saw in Mr. Sorenson's presentation
20 this morning that there were three different positions
21 of the cask in the preliminary modeling; on the
22 ground, one meter above the ground, and the cask
23 positioned (inaudible). So what should the position
24 of the cask be for a fire test.

25 Your comments, and concerns, and ideas,

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1 and suggestions are welcome, and we will consider all
2 of your comments. As I said earlier, the NRC has not
3 made any final decisions, and we plan on developing
4 detailed cask testing procedures, and in those we will
5 consider your comments, and most importantly, explain
6 why we have done what we have done, and what comments
7 we have not incorporated.

8 And we just not have at this point
9 determined what format we will be doing that in. So
10 with that, I would like to move on to the Baltimore
11 Tunnel fire presentation with Chris.

12 MS. TREICHEL: What did you mean by
13 certified casks? Did you mean certified casks or did
14 you mean those being considered for certification?

15 MS. SNYDER: Well, one of the criteria or
16 the criteria are the casks that are proposed, we must
17 feel that they are going to be used, and that there is
18 a high probability of being in the work force, and
19 that they are certified casks.

20 FACILITATOR CAMERON: Does that answer
21 your question?

22 MS. TREICHEL: I guess.

23 FACILITATOR CAMERON: Okay. Well, Chris
24 will also chime in on that, and we will get him up
25 here now. This is Chris Bajwa, and he also works with

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1 Bill Brach in the Spent Fuel Project Office.

2 He is a thermal engineer in that office.
3 He has been with the Commission for 10 years, working
4 on various activities related to fire protection,
5 including fire protection issues in nuclear reactors.

6 And Chris is responsible for conducting
7 the thermal and containment reviews of the spent fuel
8 casks that come in for certification, as well as other
9 types of radioactive materials packaging.

10 He has a Bachelors degree in Mechanical
11 Engineering from the Stevens Institute of Technology,
12 and he is a registered professional engineer in the
13 State of Maryland. And with that, I will turn it over
14 to you, Chris. And if you want to add to the answer
15 to Judy's question, please do.

16 MR. BAJWA: Sure. And before I get
17 started, and before I answer Judy's question, I have
18 some animations in this presentation, and they
19 obviously won't come to life in the slides that you
20 have in front of you.

21 So if some of you would like to move down
22 to this side of the room, you will probably be able to
23 see them a little better. Otherwise, maybe later when
24 we take a break, I can show them to you up here if you
25 would like to see them.

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1 Just a word about cask certification.
2 When a vendor wishes to certify a cask, they send the
3 information on that design into the Nuclear Regulatory
4 Commission. So we review the design and that is what
5 we certify.

6 You may get the picture that we go out and
7 look at a physical cask and say okay, you know, it
8 passes the test and we certify it. No, we certify the
9 design, and then that cask is built according to the
10 design that we certify.

11 So hopefully that clarifies the question
12 there. The Baltimore Tunnel fire. I am sure that a
13 lot of you in this room, if not all of you in this
14 room, have heard about the event. It happened in July
15 of 2001.

16 What I am going to do in my presentation
17 today is kind of separate a little bit of the fact and
18 the fiction, and the truth, and the untruth, and talk
19 about what happened in the Baltimore Tunnel fire, and
20 based on some of the work that we have done with the
21 National Transportation Safety Board, who investigated
22 that accident.

23 And to hopefully give you a clear picture
24 of what actually happened, and what are its effects on
25 the transportation of spent nuclear fuel could be. So

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1 I am going to tell you some of the facts about the
2 Baltimore Tunnel fire accident, and I will tell you
3 about the National Transportation Safety Board, and
4 the investigation that they are doing, and an
5 investigation that is ongoing.

6 In fact, they have not finalized their
7 reports on that particular accident yet, and I will
8 tell you about a certified model that we had the
9 National Institutes of Standards and Technology do for
10 us, and they are formerly the Bureau of Standards.

11 And I will tell you a little bit about the
12 model that they gave of the Howard Street tunnel fire,
13 and then I will tell you about a spent fuel
14 transportation cask analysis that we did to look at
15 the effects of that fire on a spent fuel
16 transportation cask design, and then we will show some
17 of the conclusions that the staff had.

18 The Baltimore Tunnel fire. These are from
19 the event taken both after -- well, during the event
20 and afterwards. It occurred on July 18th of 2001. A
21 CSX freight train was traveling through the Howard
22 Street tunnel in downtown Baltimore, Maryland.

23 And that particular freight train had 60
24 cars, and 11 of those cars derailed while the train
25 was passing through the tunnel. During the derailment

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1 a tank car carrying liquid tripropylene, which is a
2 flammable liquid, was punctured, and the fire followed
3 that derailment.

4 And so just to go through some of these
5 pictures that you have in the slides in front of you,
6 up here is the picture of the actual tank car, which
7 was the source of the fire that occurred in the
8 tunnel.

9 Back here is actually the west portal of
10 the tunnel, and that was the entrance of the tunnel.

11 Down here is the hole that was actually punched into
12 the tanker car during the derailment, and the hole is
13 about 1.5 inches in diameter, or was 1.5 inches round.

14 This is the picture that was taken during
15 the fire, and this is the east portal or the exist of
16 the tunnel, and this is a picture of that same eastern
17 portal taken I think about a year after the fire. So
18 after everything had been cleaned up.

19 Now, it is important to say a couple of
20 things. First of all, this tunnel is a single rail
21 tunnel. In other words, only one train can pass
22 through that tunnel at any given time.

23 The other thing to keep in mind is that
24 the duration of the fire has been a big question. In
25 the media, it has been reported that the fire lasted

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1 several days, and the last reports that we have now
2 based on National Transportation Safety Board
3 information, the information that they got from the
4 people who responded to this fire, that the most
5 severe portion of the fire did not last for much more
6 than 3 hours.

7 So the most severe portion of that fire
8 lasted about 3 hours. Now, there were other flammable
9 materials on that train. Several of the rail cars had
10 paper products on them, and as we all know, if you
11 light something and it is paper, it will burn.

12 And it was thought that several of those
13 cars had paper burning inside of them for a couple of
14 days after the accident. Of course, they were not
15 burning at a high temperature, because paper does not
16 burn that hot, and there was not enough of it to
17 sustain a fire at a very high temperature.

18 So in order to get our hands around what
19 actually happened in Baltimore, we did coordinate with
20 the National Transportation Safety Board, the lead
21 investigative agency for major transportation
22 accidents in the United States.

23 We first met with them in September of
24 2001, and have had several meetings since then to
25 exchange information on the facts of the accident

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1 itself. The cause of the derailment was the primary
2 concern.

3 The derailment -- it is known now that the
4 derailment happened before the fire. Everything seems
5 to point in that direction. So the NTSB really
6 focused on the derailment, and they were not going to
7 pursue an official analysis or a review of the fire.

8 So we decided that we were more interested
9 in the fire, and what affect that fire would have on
10 spent nuclear fuel, the transportation of spent
11 nuclear fuel.

12 So the NTSB was fully supportive, and has
13 been fully supportive of our efforts to look at the
14 fire that occurred. They provided information and
15 data, and technical expertise in the events, and they
16 also provided access to us, our staff, to the actual
17 rail cars that were removed from the tunnel after the
18 fire happened.

19 There was a lot of good information that
20 you could get from what was left over after the
21 Baltimore Tunnel fire. Now, there are a couple of
22 different ways we could have approached what happened.

23 There was not a whole lot of good
24 information on what the fire was like. We have
25 reports in the media, and some people speculated as to

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1 what the temperatures might have been. We had some
2 reports of the glowing of the brick that was in the
3 tunnel, and the glowing of the metal on some of the
4 old cars.

5 And there is some information that you can
6 glean from that, and we felt that the best way to get
7 a characterization of the fire that took place in that
8 tunnel was to do a model of it.

9 So we went to the National Institute of
10 Standards and Technology to model the fire for us.
11 And they used a computer code called the Fire Dynamic
12 Stimulator.

13 Now, what NIST has done is that basically
14 they have taken information on how fires burn, and
15 they have taken what temperatures it will burn at, and
16 they have taken what happens with chemical reactions
17 when you actually light something on fire.

18 And they have modeled that in a computer
19 code, and they have been able to take actual fires and
20 model them in a computer code and get results that
21 were roughly the same as was happening in these actual
22 fires.

23 And in fact local fire departments have
24 gone to NIST to model fires that happened in buildings
25 to see why this fire occurred, and how it turned, and

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1 how the building was damaged, and why didn't the
2 sprinkler system go off.

3 So it has been used in a number of areas
4 to figure out how fire responds, and how it operates.
5 So we went to ask them to do a tunnel fire and this
6 was something that they had not done yet.

7 And so they went through the same process,
8 and they got data from a tunnel fire test program that
9 was done in West Virginia. There were several fires
10 that were set, controlled fires, in an abandoned
11 highway tunnel in West Virginia, and there was a lot
12 of data taken from those fires.

13 And what the fire modeling that NIST did
14 was that they said, okay, let's look at a couple of
15 these fires, and model it using our code, the FDS, and
16 see if we can match the data with what actually
17 happened.

18 And so they did a couple of fires and were
19 able to match very closely to the test data that was
20 out there. And so they felt that they could take this
21 FDS tool and model the Howard Street tunnel fire with
22 some assurance that they were going to get close to
23 what happened in reality.

24 Now, you are never going to get to the
25 exact incident in a computer model, but we felt that

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1 we were close enough in this case to give us the data
2 that we needed to analyze the effects of a fire on a
3 spent fuel cask.

4 The NIST model took into account the
5 entire Howard Street tunnel, which is 1.7 miles in
6 length, and it was a 3-dimensional model, and so it
7 modeled the entire geometry of the tunnel.

8 They also modeled all the rail cars that
9 were in the tunnel at the time of the fire. So it
10 actually included everything that was in place when
11 this fire was occurring in their Howard Street tunnel
12 model.

13 Tripropylene was the fuel that was used in
14 the fire model, and there was no ventilation in the
15 model that they put together because the manual
16 ventilation system in the tunnel was not activated
17 while the fire was happening.

18 In this particular model the steady state
19 or constant conditions were reached about 30 minutes
20 into the simulation. Now, let me explain what that
21 means.

22 Basically, NIST ran their model for about
23 30 minutes, and they looked at what the temperatures
24 were in the tunnel, the surfaces of the rail cars, and
25 the surfaces of the tunnel walls, and then the gas,

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1 the hot gases that were in that tunnel while they were
2 running this fire model.

3 And about 30 minutes into their
4 simulation, they had basically reached a steady state
5 condition. In other words, those temperatures weren't
6 increasing. Now, this is the gas above the rail cars,
7 and the surfaces of the tunnel, and the surfaces of
8 the rail cars.

9 And those temperatures weren't increasing,
10 and so they had reached a steady state condition.
11 Now, this is one of the animations of the NIST tunnel
12 fire model, and what you are seeing here is
13 combustion.

14 In other words, this is what the flames
15 may look like, and I'm sorry, it is not very clear for
16 you sitting out in the audience, but you can see it on
17 the computer and it is much better if you would like
18 to later.

19 This is a picture of the combustion that
20 was happening, and what we have here is that these are
21 the rail cars, and there is a green one and a red one
22 here, and of course it is very hard to see.

23 And the length is from about here to here,
24 and that is a rail car. The tripropylene here, there
25 is a pool of tripropylene here, and this is the

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1 tripropylene tanker car.

2 And so what you are seeing is combustion
3 within the tunnel. Now when it is calculated for
4 temperatures, is that in the flaming areas of the
5 fire, or in other words, in these flaming regions
6 here, if you stuck a thermometer in there, you would
7 see a reading of about 1,800 -- a maximum reading
8 during this simulation of 1,800 degrees fahrenheit.
9 That is pretty hot.

10 Now, if you take the surface up here of
11 the tunnel and put a thermometer right on the surface
12 at the ceiling of the tunnel, you would see a
13 temperature of about 1,500 degrees fahrenheit, with a
14 maximum temperature for the entire simulation.

15 And if you took an average of the gas
16 temperature above the rail cars, or in other words, in
17 the ceiling portion, there are obviously hot gases
18 from the fire.

19 We have seen temperatures of about 900
20 degrees fahrenheit, and that is averaged over a length
21 of about four rail cars in this simulation. Again,
22 quite hot.

23 What you will see later is that as you
24 move down towards the bottom of this tunnel, the
25 temperatures drop off fairly rapidly, especially when

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1 you move away from the fire. The other thing to keep
2 in mind here is that this tunnel is sloped.

3 It is sloped at a very slight degree, 0.8
4 percent slope, going from the beginning of the tunnel
5 to the end of the tunnel. So in this fire simulation,
6 from this end to this end there is a slope of 0.8
7 percent, and you can't see that.

8 And that is part of the reason why these
9 flames are leaning over towards the exit of the
10 tunnel. The fire goes to where the oxygen is, and in
11 this case these flames were leaning over towards the
12 end of the tunnel.

13 All right. This is just basically a
14 summation of what you just saw. When we look at the
15 fire, this is degrees fahrenheit on here, and this is
16 the upper slope of the tunnel. The fire is located at
17 zero in this particular diagram.

18 So as you start at the top here towards
19 the ceiling, you are getting pretty close to 1,800
20 degrees fahrenheit. As you move down from the ceiling
21 of the tunnel, you get to the top of the rail cars,
22 and you get to the wall of the tunnel here, and you
23 get to the bottom of what looks like the rail cars,
24 the side of the tunnel, and then on down here to the
25 floor of the tunnel.

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1 And as you can see the temperatures come
2 down as you move from the ceiling to the floor, and
3 the temperatures are slightly higher to the exit side
4 of the tunnel.

5 So as you move away from the fire towards
6 the exit of the tunnel the temperatures are slightly
7 higher. So that is what NIST told us happened in the
8 Howard Street tunnel, and that was their simulation of
9 that.

10 What we also had to look at was the actual
11 materials that came out of the tunnel. There were
12 several rail cars, and there was the paint on the rail
13 cars, and some of it was charred and some of it was
14 not. The containment car itself was pretty burned up,
15 but was still fully intact.

16 So what we did is that we went to the
17 Center for Nuclear Waste and Regulatory Analysis, and
18 that is based out of the Southwest Research in San
19 Antonio, Texas.

20 At that facility, they have people who are
21 experts in materials, and how materials behave, and
22 experts in fire, and how fire behaves. What kind of
23 temperatures do fires burn at, and they did several --
24 they took samples from some of the rail cars that were
25 in that tunnel, and they looked at what these

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1 particular pieces of materials saw in the Howard
2 Street tunnel.

3 They did metallurgical analysis on some of
4 the samples, and they looked at the paint that
5 charred, and they were able to collaborate that with
6 the temperature at which paint will char. They looked
7 at materials that actually melted during the fire.

8 And they looked at the distance those
9 materials were from where the fire supposedly was, and
10 they were able to tell us what they thought these
11 particular materials saw as far as a temperature and
12 a duration.

13 And those particular results were reported
14 by the CNWRA were consistent with what we were seeing
15 in this tunnel fire model. So we had a fair amount of
16 confidence in what this fire model was telling us
17 about the temperatures in that tunnel during the fire.

18 The next step for us was to look at what
19 that type of fire -- what kind of impact that type of
20 fire would have on a spent fuel transportation cask.
21 You have seen a similar graphic in some of the
22 previous presentations.

23 In this particular analysis, which shows
24 the Holtec Hi Star 100, and this was not done in
25 coordination with the PPS study, and so the choice of

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1 the Holtec Hi Star 100 was not coordinated with the
2 choice of the Holtec Hi Star 100 for the PPS. I was
3 working on this separately and decided that this
4 particular cask would be a good one to look at.

5 Some of the graphics here, just to run
6 through it very quickly, this is the MPC which we have
7 talked a lot about, and this particular model has 24
8 spent fuel assemblies in it.

9 You can see the closure lid and the
10 overpack, and obviously the impact limiters or shock
11 absorbers as we like to call them. This is a
12 rendering of the Holtec Hi Star cask on a special
13 designed rail car, and this one gives you a better
14 picture of what it would actually look like if it was
15 traveling by rail.

16 We would have the impact limiters in place
17 on either end of the cask, and this is a cradle in
18 which the cask sits, and then is secured by tie-down
19 straps.

20 Now, this is a computer rendering, and
21 this is not an actual photograph. I think before we
22 had an actual photograph of one on a specially
23 designed rail car.

24 What we did is we put together a computer
25 analysis model, and this particular graphic shows that

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1 model, and here we have the cradle in which it sits.
2 It is two dimensional and so we are looking at a
3 cross-section, a slice, of the cask.

4 And 24 fuel assemblies, and the MPC shell
5 here, and supports for the basket, and the basket
6 which holds the actual fuel assemblies. And you have
7 the MPC shell, and the steel overpack, and then this
8 is the neutron shield material, which is held in
9 stainless steel compartments.

10 Just a little design and the detail to
11 zoom in a little bit on the model. This is a spent
12 fuel assembly and a representation of a spent fuel
13 assembly, and you can see the supports for the basket
14 here, and the MPC shell.

15 And so this is what we decided that we
16 would use to see what the effects of the tunnel fire
17 would be on this cask if it were in that particular
18 Howard Street tunnel fire.

19 What we did was we took this data from
20 that NIST tunnel fire model, and we took the
21 temperatures that they had calculated, and the maximum
22 temperatures that they had calculated, and the flow.
23 Now one of the things that is important about a fire
24 is that when a fire starts, it will draw oxygen into
25 it to keep it going, and it wants to sustain itself

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1 that way.

2 So it will create a large amount of flow
3 and turbulence within the fire. In other words, if
4 you look at a fire, it is not only always a very
5 steady flame. There is a lot of movement in the
6 flame, and there is a lot of flow around a fire.

7 And if some of you are able to observe the
8 full-scale test that eventually is done as part of the
9 package performance study, you will know what
10 turbulence in a fire is about. You will be able to
11 witness it and see it.

12 We did two assessments. The first
13 assessment was the center of the cask, that model that
14 you saw there, was located 20 meters from the fire
15 source, and that is per current Federal regulations.

16 The Department of Transportation's
17 regulations currently say that if you are going to
18 transport any kind of radioactive material, it must be
19 separated at least one rail car length away from any
20 hazardous materials.

21 So tripropylene is a hazardous material,
22 and had a spent fuel cask been on that train being
23 transported, it would have to be separated by at least
24 one rail car length from that tripropylene tanker car.

25 So we felt that was a realistic assessment

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1 of the cask, 20 meters away from the fire source. The
2 next assessment that we did was a cask located
3 adjacent to the fire.

4 The center of that particular cask was
5 located 5 meters from the fire source. So that was a
6 little bit closer to the fire source. These are our
7 results based on the model that we ran, and we ran the
8 model for a total of 150 hours. In other words, we
9 ran the temperature exposure of that particular fire
10 for 150 hours on the model of the spent fuel cask.

11 And you will see that at 20 meters, these
12 are the different temperature plots of a model, and
13 fuel here at the bottom, and a canister shell, and a
14 canister inner-shell, or a cask inner-shell, a gamma
15 shield here, and then the cask outer surface.

16 And the regulatory limit for fuel
17 cladding, or in other words, for spent nuclear fuel,
18 the regulatory limit short term temperature on it is
19 1,058 degrees fahrenheit.

20 When we certify a cask, it must show that
21 the fuel cladding will not reach a temperature of
22 1,058 during a half-an-hour fire. And that is one of
23 our regulatory limits. In this particular case the
24 fuel cladding exceeded 1,058 at 116 hours into our
25 fire analysis for a 20 meter case.

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1 And of course obviously if you move closer
2 to the fire source, you are going to heat up faster.
3 Now one thing to note down here is that it took 10
4 hours for the fuel to even change temperature; 10
5 hours of an exposure for the fuel to even start to
6 increase in temperature, and the fuel cladding is what
7 I am talking about.

8 And so for this particular case, the fuel
9 exceeds 1,058 at 37 hours. Now, a lot of people will
10 say, okay, so if you have a fire that is longer than
11 37 hours, does that mean that your fuel will fail and
12 that you will have a release.

13 Well, there are a few things to keep in
14 mind here. The temperature is a regulatory limit, and
15 is by no means the temperature at which the fuel will
16 fall apart.

17 In other words once you reach 1,059 the
18 fuel cladding explodes. It is not like that. It is
19 an experimental limit where they actually took fuel
20 cladding and exposed it to a temperature of 1,058 for
21 30 days and for 70 days, and they did not see any
22 degradation or any failure of that fuel cladding.

23 And so the NRC feels that is a fairly
24 conservative limit to say that you have got to stay
25 under that limit for the short term temperature limit.

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1 All right. This is another animation, and
2 this is that model that I showed you before, and I am
3 going to show you an animation of what happens when I
4 put it in the conditions from the Howard Street tunnel
5 fire.

6 This is an animation of five meters away
7 from the fire, and so it is going to heat up fairly
8 quickly. As you can see the maximum temperature
9 actually for now is right around the top of the tank,
10 which corresponds to the fact that the ceiling is
11 heating up first.

12 The fire was shooting up right between
13 those cars and hitting with an impact in the ceiling,
14 and you have that hot gas load developing, and you
15 will see the temperature contours -- the yellow, the
16 orange, the green, and it starts to move down into the
17 body of the tank.

18 The other thing I noticed here is the top
19 of the cradle support, it is heating up a little bit,
20 too, because the way that we made this model, we
21 figured that as it is five meters away from the fire,
22 the fire is coming up over the impact limiters, and
23 that fire has a direct view of the top of this cradle,
24 and so it is going to start to heat that up as well.

25 And as you can see, we are still going.

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1 Well, actually I think we are down now. Anyway, the
2 maximum temperature is up here at the top of the cask,
3 and it decreases as it goes down to the bottom. And
4 you have a relatively cool region down here for the
5 cask model.

6 So just to recap some of the results that
7 we had, the time to exceed the short term fuel
8 temperature limit of 1,058, for 20 meters, it was over
9 a hundred hours.

10 For 5 meters, it was over 30 hours; and
11 one of the things that we also wanted to look at was
12 the multipurpose canister, because you could fail the
13 fuel rod in that canister, and if that canister is not
14 breached, you will not have a release to the
15 environment.

16 So we looked at the canister and said with
17 this kind of an exposure would it fail and would you
18 have a breach based on stress or stresses. And as you
19 can see, for 20 meters, it would take over 30 years at
20 that sustained peak temperature for that canister to
21 fail from stress. And at 5 years it was about the
22 same. There really wasn't much of a difference.

23 Some conclusions. Honestly, from this
24 kind of an analysis, we feel that we have captured the
25 physics of what was happening, and the reason why I

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1 say the physics, is that obviously phenomenon fire,
2 and materials, and the way that they behave when they
3 are in fire, are governed by natural laws.

4 And some of you may have had physics in
5 high school, and if they are governed, the behavior is
6 governed by natural laws. If you can take those
7 natural laws, and put them into a computer code and
8 simulate, and use those natural laws to simulate how
9 a material is going to react, or how a fire is going
10 to act.

11 You can actually catch and you can
12 determine what is going to happen, and in this case we
13 looked at the cask, and we know what the materials are
14 in the cask, and we modeled those materials, and we
15 modeled the behavior materials, and we put it in a
16 fire environment, the Howard Street tunnel
17 environment.

18 And we feel that we have captured what
19 would have happened if it had been in that environment
20 based on the physics, the natural laws that are
21 involved here and what is actually going on.

22 So for this particular canister, a spent
23 fuel transportation cask design, and the exposure of
24 this cask to the Baltimore tunnel fire event would not
25 result in a radioactive release. And we believe that

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1 the health and safety of the public would be protected
2 if this particular cask design had been involved in
3 this kind of accident.

4 Implications for PPS thermal testing.
5 That is what we are here to discuss. In this
6 particular case, if you take a fully engulfing fire as
7 was proposed in the PPS, and you -- and one of the big
8 discussions going on here are duration.

9 It is very possible that for an extended
10 duration beyond 30 minutes the thermal input to a cask
11 in a fully engulfing fire test could be as worse or
12 greater than the exposure that we calculated in the
13 Baltimore tunnel fire event, and that's all that I
14 have.

15 FACILITATOR CAMERON: Okay. Thank you
16 very much, Chris. And we realize that the Baltimore
17 tunnel fire is interesting and important in its own
18 right, and we would like to try to keep on the fire
19 issues for the test, and to tie the Baltimore tunnel
20 issues in with that.

21 But let's see. It looks to me that people
22 have comments or questions on the Baltimore tunnel
23 fire, and so go ahead, Bill.

24 MR. BRACH: This is Bill Brach. I just
25 have just one what I will call administrative comment.

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1 Kalynda pointed out to me that on page 4 of the hard
2 copies that were distributed that the X and Y axis
3 were not identified. This is the profile that showed
4 the NIST temperature data, and I believe on the X axis
5 I believe that was distance, and I believe we had
6 temperature on the Y axis.

7 So for some reason when copies were made
8 all of the overheads, it appears that for some reason,
9 or at least on this one version, and it seems like on
10 Jim's also, the measured distance and temperature
11 ordinance were left off. So that is on page 4. If
12 you could put that up again, Chris, for just a second.

13 FACILITATOR CAMERON: Thank you, Kalynda.

14 MR. BAJWA: Probably the reason that it
15 didn't show up was I wanted to make sure that it would
16 be visible up here on the screen, and that did not
17 translate well into the copies, and so I apologize for
18 that.

19 FACILITATOR CAMERON: And, Chris, you can
20 either stay up there or -- well, we will see how far
21 we get with this. Bob, do you want to start off on
22 the Baltimore tunnel fire.

23 MR. HALSTEAD: Yes. I certainly
24 appreciate the opportunity to make some comments
25 today. I am very sad that Chris started off his

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1 discussion by referring to facts, and fiction, and
2 truth, and untruth, because this is exactly the kind
3 of a situation where what many of us would consider
4 truth may never be known.

5 It certainly is the kind of a case where
6 as Dr. Bonnie called for thorough peer review this
7 morning, we need thorough peer review of these
8 findings.

9 Let me tell you the difficulties that the
10 State of Nevada has had in dealing with the NRC study
11 of the Baltimore fire. But first I want to give you
12 my conclusion. Nothing I have heard in Chris'
13 presentation -- and this is the third time that I have
14 heard it. It is a very good presentation, and the
15 fire is great.

16 But nothing that I have heard in Chris'
17 presentation and nothing that I have read in the NIST
18 report done for the NRC on the Baltimore fire in any
19 way alters the conclusions in the paper that Fred and
20 I authored for waste management, nor does it alter the
21 conclusions of the study that Resacoff and Lamb did
22 for us in September of 2001.

23 Nor does it address the issues in a report
24 that we will be submitting. I must tell you that we
25 were going to keep this dicey stuff for litigation,

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1 but I suppose we will put it in the hopper here.

2 An analysis by Dr. Myles Griner of the Mechanical
3 Engineering Department, who is by the way one of the
4 technical advisors to Sandia on the report, where
5 there are performance envelope analyses of cask
6 performance in fires, which I think just draw totally
7 different conclusions from what Chris has drawn.

8 In July of last year, Wayne Hodges of the
9 Spent Fuel Office, denied our expert, Dr. Merritt
10 Berkey, with 37 years of experience, as the NTSB's
11 chief fire investigator, and before that a fire
12 investigator for NIST, and Dr. Berkey was denied the
13 opportunity to sit in during the meetings that the NRC
14 had.

15 And frankly, Bill, I don't know what your
16 legal authority for that is, but we are certainly
17 researching it. Secondly, you will note from the
18 title page of the NIST report that the publication was
19 completed in August, and I got my copy February 10th,
20 and I don't know when others got theirs.

21 And, thirdly, we were therefore forced to
22 file a Freedom of Information Act request, which to
23 date we have spent between \$1,500 and \$2,000 on more
24 or less meaningless photocopying, because you know on
25 a FOIA, it is easy for an agency that doesn't want to

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1 give you their information to send you all kinds of
2 meaningless documents.

3 And frankly, all the substantive issues
4 aside, I cannot for the life of me come up with a good
5 reason for why you would treat us like this and then
6 come to a meeting and want to talk about public
7 confidence.

8 Now, about the specific issues in the NIST
9 report. The first problem is that we think there is
10 a bias in the way that the NRC approached this report.
11 They did not start out to do an objective
12 investigation of the fire.

13 They set out to see if they could defend
14 their fire standard. Everything that we have seen in
15 our interactions with them suggests that to us. And
16 the way to resolve this is you can set up a meeting
17 with us, and I have not heard anything from you about
18 this, but we have asked you to bring the authors of
19 the NIST report to one of these meetings, and we will
20 bring our experts in, and we will go over these
21 issues.

22 Secondly, the most important issue for
23 testing is to see what was the worst case fire that
24 could have occurred in the Howard Street tunnel. Now,
25 we have told you about all other kinds of horrific

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1 accidents, and those 21 that I keep mentioning that
2 you have not responded to.

3 And I don't see anything to change my
4 conclusion that a 24 hour fire at over 500 degrees
5 fahrenheit, or a 12 hour fire at over 1,500 degrees,
6 or 800 degrees, is a reasonable fire.

7 And there are all kinds of complicated
8 fire issues which I am not going to bore you with, but
9 I am going to outline them at the end here. But going
10 into this discussion of what constitutes a worst case
11 fire, the Baltimore fire is useful, but it is not the
12 end-all.

13 Point 3. For testing of a cask the issue
14 is what is the most vulnerable combination of cask and
15 fire configurations that could have occurred in that
16 fire, and frankly we think you got great performance
17 out of that welded canister.

18 And that's why we think you probably ought
19 to require it. A traditional steel-ledge steel cask,
20 certainly a truck cask, would have failed in that
21 fire.

22 The fourth point is that the key fire
23 condition issue is what if there had not been the
24 intrusion of the water from the burst water main which
25 cuts off the hottest part of the fire in 3 hours.

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1 And Chris and I have debated this before,
2 and Chris thinks the longest duration of the fire
3 could have been 7 hours, and we think it could have
4 been greater than that, but there is no doubt in their
5 report that it says 3 hours at a thousand degrees c.
6 is a reasonable duration and temperature combination.

7 Point 5, and this has several subpoints to
8 go to the questioning of the methodology that Dr.
9 Berkey prepared for us. First of all, and without
10 belaboring it here, we want an explanation of why you
11 think the fire reached a steady state in 30 minutes,
12 and some alternative values are possible.

13 Secondly, we would have liked to have seen
14 the tunnel simulation run for at least 3 hours instead
15 of the 30 minutes.

16 The third subpoint, and this analysis may
17 be most important, it does not to us appear to include
18 the reradiation of the heat that is absorbed by the
19 brick wall of the tunnel during the hottest part of
20 the fire.

21 Now, it is difficult to calculate exactly
22 what that means for the fire environment, but at a
23 minimum you have got 3 hours at a thousand degrees c.
24 And then you have got a larger fire of 7 hours at 800
25 degrees c., with a 3 hour spike at a high temperature.

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1 Also, because of the reradiation of the
2 heat from the tunnel wall, and because you have got
3 paper burning probably around 500 degrees fahrenheit,
4 you have got both an extension of that thermal
5 environment in the tunnel; and beyond that, because
6 the fire is burning and the firefighters can't get in
7 there, you have got an extended period of cool-down,
8 and that is cool-down after the cask has reached its
9 maximum temperature.

10 So for all of those reasons, we don't
11 think you have shown us very much about the Baltimore
12 fire, and we think that you chose a cask that had
13 exceedingly good fire performance. We are not sure
14 that we can agree with your analysis.

15 And the bottom line is here is where you
16 need to have rigorous peer review. So we would love
17 to have a blood bath. Bring your people to the room,
18 and we will bring our people to the room, and let's
19 see what they conclude.

20 Now, I really don't want to do that. What
21 I really want to do is bring some reason to this
22 discussion of setting a target for a failure analysis,
23 and certainly it seems to us that 3 hours at a
24 thousand degrees c. is one fire duration temperature
25 combination that can be drawn from this study.

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1 And it is also possible that somewhere
2 between 7 and 12 hours at 800 degree c., with a 3 hour
3 spike, at a thousand degrees, is very important, and
4 are reasonable fire parameters.

5 And I want to conclude by saying that I
6 like Chris very much, and I am impressed by the
7 elegance of his analysis, but I am very saddened by
8 the institutional relationship that has been poisoned.

9 And, you know, these are things that --
10 you guys are real nice in this proceeding, and then we
11 keep having these horrific interactions with your
12 technical people.

13 And for the life of me, I can't figure out
14 what is going through their mind. In particular, to
15 sit on that report -- and now maybe you were doing
16 some reviews, but it tells me that the manuscript was
17 finished in August, and here we are going through FOIA
18 to see what documents we want photocopied, and not
19 having been honestly told that the report is completed
20 and being withheld. It doesn't look very good to me.

21 FACILITATOR CAMERON: Bob, thank you for
22 those comments, and maybe this meeting that the staff
23 wants to have belatedly, you can work out some of
24 these issues so that we can get past that poisoning of
25 the relationship.

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1 MR. HALSTEAD: There is a final irony
2 here. The NTSB is so confused about their analysis of
3 the Baltimore fire that last week when I wanted to
4 bring -- and in fact we had Dr. Berkey at the meeting,
5 and we wanted to put him up to give a little bit of
6 critique, and we heard that morning that the NTSB was
7 so concerned about their inability to conclude their
8 investigation of the Baltimore fire that they had
9 written a contract for Dr. Berkey, who had retired a
10 few months earlier, and asked him to come back.

11 And there is a clear potential conflict of
12 interest on the Baltimore fire issue. Now, he may be
13 able to be our representative on designing the thermal
14 test protocols, but the conclusion is that a couple of
15 months of employment as a consultant for the State of
16 Nevada critiquing government agencies makes him very
17 saleable. And for those of you with some career
18 plans, you might want to think about that.

19 FACILITATOR CAMERON: Okay. Thanks, Bob.

20 MR. BAJWA: Chip, I just have to say a
21 couple of things. Obviously Bob and I have a
22 difference of opinion on this, and some of the things
23 -- and in fact all of the things that Bob has said I
24 think we can work through in a face-to-face meeting.

25 The experts who put together the NIST

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1 report for us are fully willing to sit down and talk
2 about this with Bob and anyone whom he would like to
3 invite. So we have made that offer before, and we
4 will stick to that.

5 MR. HALSTEAD: If you had made that offer
6 before, I would have accepted it. I heard it today
7 for the first time, Chris.

8 MR. BAJWA: I believe we discussed it at
9 our last meeting, but actually I believe, Bob, that
10 you were the first one to suggest it.

11 MR. HALSTEAD: Yes, I did.

12 MR. BAJWA: Okay. You were the first one
13 to suggest it, and I had decided before you suggested
14 it that it would be a good idea, but you were the
15 first one to suggest it.

16 Let me just explain. What I mean is that
17 we were open to do that, and Bob suggested it, and I
18 quickly agreed. Would you agree with that?

19 MR. HALSTEAD: Yes, and I think that the
20 sooner we get -- but what I am going to do is not miss
21 the point here, because we will never know what would
22 have happened in the Baltimore tunnel, and the
23 important thing is to come up with a good fire test
24 protocol.

25 FACILITATOR CAMERON: Right.

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1 MR. HALSTEAD: Can we agree on that?

2 MR. BAJWA: Absolutely. That is what we
3 are here to do. That is what we are here to do.

4 FACILITATOR CAMERON: And so let's have a
5 final comment on this part of it. I am not talking
6 about the rest of you. But I think that Bill wants to
7 try and clear the air a little bit. So, go ahead.

8 MR. BRACH: Hopefully clear the air. Bob,
9 you have made a number of comments and many of them
10 are right on the mark. We had been talking earlier
11 today or actually quite a bit of the day about public
12 confidence, and public trust, and the comments that
13 you have made clearly indicate that from a pass
14 practice, lessons learned, we still have a lot to
15 learn.

16 And I apologize and recognize that, and I
17 just want to make a few comments. One, the contracts
18 that we have had -- and Chris has summarized it, but
19 with Patel Pacific Northwest Labs to assist us in this
20 review, and the National Institute of Standards
21 Technology, and those are contracts that the NRC had
22 with individual entities or parties, to assist us in
23 carrying out the review.

24 Meetings between the NRC and our
25 contractors in these activities are not public

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1 meetings. They are not traditional at all public
2 meetings. The interactions between us and the
3 contractors involve everything from the work that they
4 are doing, and the status of the work, and aspects of
5 financial arrangements as well.

6 And I say that, because the meetings that
7 you have mentioned were not public meetings, and you
8 or your representatives were not specifically
9 excluded, while other members of the public if you
10 will were allowed. Those were not meetings of that
11 nature.

12 But rather than trying to dwell on that,
13 I think what I really want to do is go back to the
14 point that you stressed with regard to efforts on our
15 part to build confidence and to build trust by what we
16 do and not by what we say.

17 And I think that the point that you made,
18 comments were offered, and one I have heard, and I
19 think we all collectively here understand and
20 recognize where we are and where we need to be, and
21 establishing and building that trust and confidence.

22 And the last comment is that both Amy has
23 mentioned and Chris has mentioned that we did discuss
24 briefly last Thursday at the first workshop up in
25 Rockville, and that is the agreement suggesting -- and

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1 I am not going to get into the territory of who
2 suggested or thought of it first.

3 But from the standpoint of having the
4 folks from NIST and Patel Pacific Northwest Labs, and
5 our staff, and Bob, folks that you had mentioned
6 affiliated with the State, to sit down and walk
7 through what we did, and the basis of what we did, and
8 the modeling, and the assumptions that we used.

9 And hopefully we can come to a technical
10 understanding. I don't want to reach too far and say
11 technical agreement, but a technical understanding of
12 the approach and the conclusion -- the approach that
13 we took and the basis for the conclusions that we have
14 reached in the study.

15 FACILITATOR CAMERON: Okay. Great.
16 Kalynda, and then we will go over to Mike.

17 MS. TILGES: Thank you. I have a question
18 and a comment relating to this, and then I have a
19 process question.

20 FACILITATOR CAMERON: All right.

21 MS. TILGES: First of all, my comment is
22 just to say that face to face is great. You know, it
23 seems to me, and again I have to go back to
24 comparisons with the Department of Energy.

25 Whenever we get into these kind of head-

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1 butting situations, they always want to have face to
2 face meetings. Well, I think we need public meetings.
3 I don't want face to face meetings where just a couple
4 of people know the information, and then maybe it is
5 filtered to the public.

6 That is what I was talking about if you
7 are talking about confidence and trust. I am talking
8 about complete openness and transparency in every step
9 of this process. And not just within the agency, but
10 to the public.

11 You can't expect confidence and trust from
12 the public if you are not willing to trust them and be
13 confident in them yourselves. My question related to
14 this is with the combined heat from the inside of the
15 cask, because we are looking at built high heat from
16 radioactive spent fuel, the combined heat from the
17 inside of the cask, and the heat from the outside of
18 the cask taken into consideration.

19 And I will let you answer that first, and
20 then I will ask my process question.

21 MR. BAJWA: Okay. Yes, we had a heat load
22 of 20 kilowatts inside the cask.

23 MS. TILGES: Could you put that in
24 layman's terms?

25 MR. BAJWA: Okay. That is the maximum

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1 that is allowed for that design.

2 MS. TILGES: Which was -- can you give it
3 in fahrenheit?

4 MR. BAJWA: It is not a temperature. It
5 is a heat flux coming off of the fuel. For this
6 particular design, it was a design basis fuel. In
7 other words, they could not load anything hotter than
8 20 kilowatts in that particular cask design.
9 So we took the worst case.

10 MS. TILGES: So again, does any member of
11 the public here understand what he just said?

12 FACILITATOR CAMERON: Let's see if we can
13 get a clarification of that and then we are going to
14 have to move on. I mean, we will see if there is an
15 easy way to explain it. Chris, can you try? Can you
16 try to do a brief one for us, Carlos? And please
17 introduce yourself.

18 MR. LOPEZ: Carlos Lopez, Sandia National
19 Labs. If you can relate watts by thinking of a light
20 bulb, and that you use for your house, usually a 60
21 watt light bulb, and if it is on for maybe even 3 to
22 5 minutes, you can hardly touch it. It would burn
23 your hand a little bit.

24 And so when he had said 20 kilowatts, it
25 is 20,000 watts, as compared to 60 watts of a light

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1 bulb.

2 MS. TILGES: Well, I understand the
3 difference between watts and kilowatts. What I want
4 to know is how hot was it in temperature terms, so
5 that everyone here can understand that who doesn't
6 have the ability to work for Sandia.

7 MR. LOPEZ: I am not sure if that kind of
8 data is available here, but what you do is -- and like
9 he mentioned before, you run a steady state of
10 analysis, where you have the heat load distributing
11 over the cask, and there is a point where the cask is
12 transferring heat to the environment, and the so-
13 called (inaudible) transfer, which is part of the
14 regulations, as well as the package vendors are
15 required to look at the normal condition of transport
16 by what is called a temperature distribution.

17 And where you usually have hotter
18 temperatures in the middle of the cask, and cooler in
19 the other places of the cask, or the surface of the
20 cask, and then after you reach that stage condition,
21 then you do the fire test.

22 Now, I am not sure if Sandia has the data
23 here available to tell you the exact temperatures, but
24 I am just going to guess that the outer surface of the
25 cask may be somewhere around 80 degrees c., which may

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1 be --

2 MS. TILGES: What I asked for was the
3 temperature of the inside of the cask.

4 MR. LOPEZ: I don't have that data.

5 MS. TILGES: Okay. So we answered that
6 question, which is that nobody knows, or is willing to
7 tell us.

8 MR. LOPEZ: No, we know.

9 MS. TILGES: Well, can I get that figure,
10 please.

11 FACILITATOR CAMERON: Go ahead.

12 MR. BAJWA: The result figure that we had
13 in the handouts, that shows the temperature of the
14 inside of the cask during that transient, and the heat
15 up of that cask in the fire.

16 If it is not clear on your handout, I will
17 show you that graph on the computer, and it is very
18 clear.

19 FACILITATOR CAMERON: Okay. Let's go to
20 your process question.

21 MR. LOPEZ: Okay. The answer is 700
22 degrees fahrenheit in the middle of the cask, and 200
23 degrees fahrenheit on the outer wall where you can
24 touch, which is somewhere around 80 to 100 degrees c.
25 like I mentioned before.

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1 MS. TILGES: I thank you for the final
2 answer. However, that round and round, I simply am
3 more confused than I was in the beginning, but thanks
4 for trying. The important thing now is the process
5 question.

6 We are now at 10 past 5:00 and the
7 original agenda that went out called for a public
8 comment period from 5:00 to 7:00, and indeed that is
9 what the grass roots organizations put out to their
10 constituents for the public to show up from 5:00 to
11 7:00.

12 We are seriously behind schedule, and I
13 think the public deserves to know if they are going to
14 be able to make comments, and if so, what time and how
15 long this meeting will go on. Personally, I am
16 prepared to stay until the cows come home. Thank you.

17 FACILITATOR CAMERON: Now, let's be
18 specific. What time is that?

19 (Laughter.)

20 MS. TILGES: Until we get through the
21 entire agenda and all the public has had a chance to
22 comment.

23 FACILITATOR CAMERON: Now, we are going to
24 go out to hear comments from the public, and we are
25 very sorry that the agenda switched, and that was a

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1 mistake. And we do want to get comments from this
2 panel on these fire issues, and as soon as we are done
3 with that, we will go out and see if anybody has
4 comment.

5 So let's say that we run until to quarter-
6 to-six with this particular discussion, and then we
7 will go out to the public, and we will assess where we
8 think we are with getting input on this fire issue,
9 okay? So let's go to Mike.

10 MR. BAUGHMAN: Chip, I guess I have a
11 question. Looking at the PPS, it appears as though
12 that the rail casks, that the analysis for the fire
13 scenario, whether it is 1.3 meters or 3 meters, or
14 whatever, does not include rail time.

15 In fact, for your truck scenarios as well,
16 it appears as though in all of our scenarios the cask
17 has become detached from its transport vehicle, and I
18 am wondering first of all why we are assuming that,
19 and it appears to me as though the transport vehicle
20 itself, the rail car or the trailer that the cask sits
21 on a truck represents shielding that is not being
22 considered here, whether it is impact or fire.

23 And it seems to me that if the assumption
24 is that, well, if it gets in a wreck that it is going
25 to fall off, and so we have to model it that way, why

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1 aren't we figuring out how to keep it on that thing if
2 that does provide some measure of shielding.

3 And why aren't we considering that
4 shielding in the analysis.

5 FACILITATOR CAMERON: How about an answer
6 to that?

7 MR. SORENSON: Well, you are absolutely
8 right, Mike. It does not include any of the
9 conveyance, the trailer, or anything like that, and
10 typically looking at the performance of these casks in
11 these accident environments, we really do try to look
12 at what is the response of the cask itself.

13 And that primary containment boundary that
14 John was talking about to these very severe
15 environments. You are right. You do get shielded
16 from the conveyance, but there are different designs
17 out there and different scenarios, and so I think the
18 NRC really looks to rely on the cask containment
19 boundary itself to provide that protection and safety.

20 MR. BAUGHMAN: Well, for the impact test,
21 which I appreciate that we are not there yet, but the
22 weight of that trailer, for example, when that cask
23 crushes that highway pillar or whatever, has that been
24 factored into the analysis?

25 I mean, we are not including that then.

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1 So I think that there is a flaw in not factoring in
2 these transportation -- you know, the trailers and the
3 rail cars.

4 DR. MURPHY: I am not sure it is a flaw,
5 but a decision that was made, because that is what
6 went into the proposal, and we had to make some
7 decisions. Our interests was to show that we could
8 get the behavior of the cask as a unit, and to be able
9 to get that correct.

10 And as we talked about with the unyielding
11 surface, we could do the unyielding surface, but
12 (inaudible), and as a seismologist, I know looking at
13 non-linear ground behavior when that ground behavior
14 is of granite, or of sand, is very difficult.

15 We are looking at a program -- and I don't
16 want to say that we decided on the things, or we
17 proposed the things that we think we can handle at
18 this time, and the things that are critical to
19 behavior in the performance of the cask.

20 If we can get these right, then those
21 represent -- I will say -- the conservative. We would
22 have known that for a fire that the conveyance,
23 whether it is a truck or a rail car, would in some
24 sense protect, and act as an insulator between the
25 fuel and the cask.

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1 So that if we can do the cask simply
2 exposed to the fire or to the fuel, and if we can get
3 that right, then we can show that and there are no
4 surprises, and we won't have to go back and rewrite
5 our regulations. We have done our job for that.

6 Then if there are scenarios that come up
7 and we need to examine, or want to examine, we can
8 take a look at what the effect of the conveyance might
9 be on the performance of the cask.

10 Like I said, we are trying to eat an
11 elephant one bite at a time, and if we can get, and I
12 think we can, we can get the performance of the cask
13 right, the other things will come along later as
14 necessary.

15 FACILITATOR CAMERON: Thank you. Is that
16 an acceptable explanation? Do you have any questions
17 about that?

18 MR. BAUGHMAN: It is. I think that is a
19 great explanation for the rail car. I am a little
20 more concerned about the cask and the impact, and just
21 the added weight of the truck and all that.

22 FACILITATOR CAMERON: All right. Let's go
23 to Judy, and then Diane.

24 MS. TREICHEL: I wanted to know if during
25 that Baltimore experience did any of the cars tip over

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1 in the tunnel?

2 FACILITATOR CAMERON: Chris.

3 MR. BAJWA: No, the tunnel itself was not
4 large enough to allow any of the cars to tip over,
5 especially the rail cars that were -- the large, tall
6 rectangular cars. The Tripropylene tanker car was on
7 its side due to the derailment, but it was not able to
8 fully tip over. It was at an angle.

9 And again because of the geometry of that
10 tunnel, the size of the tunnel, would not let it fully
11 go on its side.

12 MS. TREICHEL: Okay. And then it showed
13 that there was a whole in the tanker car. Do you know
14 what caused that and what would it have done had that
15 been a cask and hit in the middle and not on the
16 impact limiter?

17 MR. BAJWA: First of all, the brake
18 mechanism of that particular car because dislodged
19 during the derailment, and it swung up and it hit the
20 tanker or the tank car, sorry, and punched a hole
21 inside it. We did not look at what a brake mechanism
22 would do to a cask, but the break mechanism on a cask,
23 or I'm sorry, on a rail car used to transport a cask
24 is very different than what is used on a tank car.

25 So we have not looked at that and we don't

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1 know if it would do the same kind of damage. We doubt
2 that it would.

3 MS. TREICHEL: Thank you.

4 FACILITATOR CAMERON: Okay. Thanks,
5 Chris. John.

6 MR. KESSLER: I wanted to get back to the
7 previous discussion about whether you include the
8 trailer or not, and would you include the effects of
9 the soft ground versus these unyielding surfaces. I
10 guess the concern that I have is that we seem to be
11 putting the cart before the horse, in the sense that
12 until all of these analyses, in terms of what are the
13 risks or the effects of something more real world, in
14 terms of what did those cause in terms of potential
15 damage.

16 And I am not sure that we an -- well, it
17 is not so clear why what is being proposed is
18 relevant, and I just wanted to point out that this
19 discussion about what mitigating effects might the
20 trailer on a truck or the flatbed might have, and what
21 does real ground act like in terms of how much energy
22 it absorbs.

23 And then how do you relate that back to
24 how hard do you really have to hit this thing in some
25 sort of realistic set of circumstances, and how likely

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1 is that, are all things that I would like to see
2 flushed out more before you say go with this and have
3 a good justification for it.

4 FACILITATOR CAMERON: In other words,
5 apart from the issue that Mike brought up, there is
6 still a lot of unanswered questions in regard to the
7 protocol itself.

8 MR. KESSLER: Right. And if you look at
9 -- and let's say that they are proposing 75 miles an
10 hour, and people could say, yeah, 75 miles an hour, we
11 have speed limits like that, and that sounds good.

12 At 75 miles an hour on an unyielding
13 surface, and then what does that mean, and how often
14 do we have the equivalent, and I know that Andy is
15 talking about simplifying things, because this is a
16 tough question to answer.

17 But I think that all of us would like to
18 have some feel for what that means. How likely is it
19 that we have the equivalent of those kinds of
20 conditions, and what do we have statistics out there?

21 I know that it can be at least approached
22 in terms of an answer. The other thing that I think
23 would be useful is some sort of discussion about how
24 safe is safe. I think that this is one of the
25 problems that we are having here, is that some people

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1 have one concept of safe, which means that I may be
2 misinterpreting some of Bob's comments about I can
3 name 23 accidents that are worse.

4 And the idea is that safe -- or my
5 understanding is that the NRC feels that safe is you
6 have got the vast, vast majority of cases covered.
7 You have confidence that the probability of an
8 accident resulting in some sort of health effect is
9 very, very low, and that governs what you are
10 proposing in PPS, and it governs your regulations, and
11 everything there.

12 And what we need to talk about is bringing
13 things back into that risk informed space, which the
14 NRC is trying to be in here. And you have got to look
15 at the realistic conditions and get some sort of
16 estimate as to how often is that going to occur, and
17 how many of these extreme cases are we going to try
18 and cover.

19 FACILITATOR CAMERON: Do you feel that
20 since we are discussing fire here, do you think that
21 there is not enough information presented in the fire
22 part of the protocol to really make any good judgments
23 in regard to risk informed --

24 MR. KESSLER: I think it would be useful
25 if you are going to present a particular fire protocol

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1 that you try to put risk information in it. When I
2 read what was in the report, what it boiled down to in
3 the end was that we are going to run this thing until
4 it fails, because we want to see what failure looks
5 like.

6 Okay. If you clear out that that is what
7 your real goal is, that's fine. I am just suggesting
8 that let's try to make it some sort of touch on
9 reality. I mean, what are we talking about in terms
10 of different kinds of conditions that could possibly
11 lead to what you did in this test that caused this
12 thing to fail, and continue to heat the thing until
13 something fails.

14 FACILITATOR CAMERON: Okay. I would be
15 interested in reactions to that. Andy, did you want
16 to clarify something and then we will go to Diane.

17 DR. MURPHY: I wanted to come back to a
18 particular point, and that is that in the protocols
19 itself, we talk about the impact, which is later on
20 today, and we selected the 75 miles an hour.

21 And for that particular test, we went back
22 in and had Sandia look at the statistics that are
23 already available, and I hate to say it, but from
24 6672, and that is going to bring up another topic, and
25 that gave us using those numbers -- and we put them

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1 there in black and white.

2 And they show that the probability of the
3 frequency with which the 75 miles an hour accident
4 would occur into a granite surface, a hard rock
5 surface, about 10 to the minus 7.

6 And we have not done those calculations
7 and looked at that information specifically for fire
8 yet. It was our intent to put that Appendix A in
9 there to indicate how we would be looking at those
10 decisions.

11 So that in the final detailed test plan,
12 and if the fire test lasts, and we have it in the
13 program, and it has not changed so dramatically, we
14 will take a look at the statistics of how often that
15 particular fire would occur or has occurred in the
16 past.

17 And that would be included in the package
18 and in the document describing the detailed tests. So
19 it is our intent to take that information into account
20 when we make the decisions about what the test is
21 going to be.

22 FACILITATOR CAMERON: All right. Let's go
23 to Diane, and Fred, and then Bob.

24 MS. NIELSON: Just some input on what I
25 would like to see in terms of the fire test and get us

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1 back to that point. I would like to see the test run
2 with the cask on a support rail car and road
3 transport, and off, if you believe that the cask can
4 become detached from the transport in an accident.

5 And I want to see what happens if you have
6 been impacted first when it has been crashed first and
7 rendered -- well, I want to know what the difference
8 is -- and I don't know what temperature to give you,
9 but something that exceeds the standards, or the
10 regulatory standards that you are using for
11 certification now.

12 And for a situation where the shielding
13 has been compromised and where the containment has
14 been compromised. So if we have got a crash where
15 that has occurred, and I want to understand the
16 difference when you have got that within a containment
17 that looks like a tunnel, or acts like a tunnel
18 pulling air through, as opposed to an open air
19 situation.

20 FACILITATOR CAMERON: Diane, thank you for
21 the suggestions. Fred.

22 MR. DILGER: Two things. First, to go
23 back to Mike Baughman's point a little bit. The
24 consensus that came out from last week's meeting in
25 Washington from the cask designers and the cask

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1 testers, and the guys with a lot of experience doing
2 this, is that to attach the cask to a carriage would
3 be to essentially add an impact limiter to it.

4 And that it would behave like an impact
5 limiter, and the suggestion was made that it would
6 give really good visuals for the public confidence
7 area, and I think that was discarded at last week's
8 meeting, because it was agreed that by simply testing
9 the cask without the additional limiter of the
10 carriage that you had a tougher test.

11 So if we test these without a carriage
12 hook to it, we miss the visual, but we get a tougher
13 test. And I think the tougher test is better. The
14 second thing is that I think that John has made a very
15 good case for regulatory testing.

16 And I think that the arguments about how
17 probable accidents are and how likely they are, and
18 all of the other probablistic issues out there don't
19 need to be addressed when we merely do what our
20 existing regulations call for.

21 And I would like and I would advocate that
22 once again after we do the regulatory testing, we
23 don't need to get into the arguments about how good or
24 bad 6672 is, and that we do not need to get into a lot
25 of probablistic risk analysis, and that we can rely on

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1 those regulations, which admittedly model a very, very
2 serious accident.

3 FACILITATOR CAMERON: Thank you, Fred.
4 Bob.

5 MR. HALSTEAD: Well, as the hour is late,
6 I think the more charitable thing that we can say
7 about the fire section of the testing protocols is
8 that it is not acceptable. It is not a basis for
9 making any decisions for a whole lot of reasons.

10 Some of the issues that Mike has raised --
11 I mean, they are just amazingly a large number of
12 configurations of how the car or tanker could be in
13 the tunnel and in fact if the cask is on the rail car
14 and higher, then it is closer to the ceiling of the
15 tunnel where the greatest irradiation of the heat is
16 occurring.

17 So what it does is that it tells you about
18 the complexity of modeling what you want to do in the
19 test, and let's make it clear. We are not advocating
20 doing any extra regulatory testing without modeling,
21 and what it is that we are going to simply get out of
22 it, and I think that is a waste of time, although I
23 agree with Fred that we are probably safer sticking
24 with the regulatory temperature of the fire, and then
25 varying the duration of that.

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1 But the long and the short of it is that
2 we have not even talked about pool fires, and Carlos
3 has got lots to say about pool fires, and pipeline
4 fires, and Myles Griner did some analysis for us, and
5 talked about the fact that the engulfing fire may not
6 be the hottest fire.

7 That in fact in a wind-driven fire that
8 the impingement of it at the windward side of the fire
9 may in fact lead to a short duration, but extremely
10 high temperature, fire. And depending on the
11 configuration of the wind to that fire, you may get a
12 whole lot of other fire issues that you may want to
13 look at.

14 What we say is this. We think that the
15 fire test is the most important regulatory test, partly
16 because of our concern about the seals on the cask,
17 and partly because of our concern about the
18 radiological consequences is, does the radioactive
19 cesium get out of the cask. Is there a clear pathway,
20 and then by god is there a fire that has got a plume
21 with particles in it being carried downwind.

22 So I hate to say this, but you have got a
23 real problem here with the difference in the
24 acceptability of the extra regulatory impact and fire
25 analysis, and I am going to defer arguing with you

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1 about the impact stuff.

2 And I think the only way I can see us
3 agreeing with this is that you are going to have to go
4 back and redo your fire analysis and maybe you are
5 going to have to come back and talk to people about it
6 again. I don't see any other way to resolve these
7 issues. Thank you.

8 FACILITATOR CAMERON: Staff, you have
9 heard comments about -- Bob termed it unacceptable,
10 and he has given some reasons. John was talking about
11 how there needs to be more types of information in
12 there.

13 Do you have any -- and I have not heard --
14 and of course Diane requested that there be some other
15 questions and situations looked at. Is there anything
16 that you need to know that you want to ask people
17 around the table, in terms of revising the draft test
18 protocol?

19 And I guess I should ask if there is any
20 people around the table who feel that the draft test
21 protocol is great just like it is, and give the
22 reasons for that? Any questions that you want to ask
23 the group?

24 MR. BRACH: I just wanted to add that the
25 purpose of this meeting is on our part not to be

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1 making decisions, and is to listen to comments and
2 clearly, Bob, I heard your concluding comments with
3 regard to the fire test consideration parameters, but
4 from the standpoint of the comments that were offered
5 and Diane's comments earlier had a number of different
6 considerations for tests, and test arrangements.

7 From my perspective the purpose of the
8 meeting is for us to hear these suggestions and
9 comments, and if you will the why behind those
10 suggestions and comments, and I don't have any further
11 questions, but as Bob suggested, there may be quite a
12 bit of work on our part as we look at the fire test,
13 and planning for the fire test and conditions, to help
14 us reach final recommendations and decisions.

15 FACILITATOR CAMERON: Okay. Let's go to
16 Kalynda and then we will go to Jim Channell. Kalynda.

17 MS. TILGES: I just wanted to state
18 Shundahai's position on the fire test, and the
19 orientation. And after my last question, I think it
20 is probably not necessary to remind everyone that I am
21 not a scientist, and so I will make this simple; is
22 that Shundahai feels that as far as the heat the cask
23 should be tested with the hottest burning substance on
24 our Nation's rails and roads.

25 I don't know if it is jet fuel, and I

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1 don't know if it is diesel fuel. I don't know what it
2 is. But the hottest burning substance that is allowed
3 to travel on the Nation's rails and roads, that is
4 what should be used.

5 It should be a fully engulfing fire, and
6 we would also like to see concentrated flame on known
7 unperceived weak spots, such as the lids and the
8 hinges. I mean, the welds. Excuse me. Anyplace
9 where it connects.

10 FACILITATOR CAMERON: And when you say
11 concentrated, is that what people -- like the torch?

12 MS. TILGES: Like a torch test, but again
13 I don't want to just say that and let it go. I am
14 talking about the highest temperatures that could ever
15 possibly hit it. I don't know how you do that with a
16 torch test. You have got a lot of scientists to
17 figure that out.

18 But to me if it is not being tested with
19 the hottest fuel and it is not being tested in the
20 specific weak spots or perceived weak spots, then you
21 don't have an accurate test and you don't have
22 accurate results.

23 FACILITATOR CAMERON: Okay. Thanks,
24 Kalynda. Jim.

25 MR. CHANNELL: I think the fire test

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1 probably needs more work. For one thing, there is
2 still an uncertainty about how long you want to go
3 with this. A couple of concerns that I have right
4 now, one of them is tied in with my earlier concerns
5 about doing the full-scale hypothetical accident
6 condition test, is that you would do a regulatory fire
7 test to be sure that your cask will pass that test,
8 and then you need to do this extra regulatory test on
9 whatever you decide to do.

10 Now, you cannot do this at the same time.
11 You might be able to do it later with the same cask.
12 I don't know why you couldn't. But I think that these
13 are two different things, because if you do the extra
14 regulatory test and you get some seal failure, which
15 you would expect to get, you still can't go back and
16 say, oh, well, it would have passed the regulatory
17 test unless you checked it.

18 FACILITATOR CAMERON: Okay. Thank you,
19 Jim. Other comments on the fire issues, optically
20 dense, and then we are going to go out to the
21 audience. Anybody around the table want to offer
22 anything? Andy.

23 DR. MURPHY: Just a quick comment to maybe
24 make my job a bit easier. If you can provide the
25 specificity in your comments like Kalynda just did,

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1 and what you see as bad or unacceptable, and needs to
2 be improved, that information as I said will make my
3 job a whole lot easier in addressing your comments and
4 concerns.

5 FACILITATOR CAMERON: Okay. And, Peggy.

6 MS. JOHNSON: Citizen Alert will have
7 comments to the NRC before May 30th, and you know, I
8 have been in a lot of meetings where people say, well,
9 why -- well, we really want your input and we are
10 really going to listen to you.

11 I want to make sure that you are really
12 listening to us, and I want to make sure that when we
13 give comments and when we give suggestions, if it is
14 not working out for you, or there is reasons why you
15 don't think it is going to work, I want to have
16 somebody communicate that to me so that I know that
17 you actually did listen. Thanks.

18 FACILITATOR CAMERON: That is obviously an
19 important point and the staff is considering the best
20 way to indicate that it did listen to people. Go
21 ahead

22 MS. JOHNSON: Well, I want to say that has
23 not happened in the past, and that is why I am raising
24 it.

25 FACILITATOR CAMERON: Okay. Thank you.

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1 Okay. Comments or questions from the audience on this?
2 Oh, I'm sorry, and please introduce yourself.

3 MR. ZABARTE: My name doesn't matter, and
4 I am Western Shoshone and my name is Ian. And it is
5 too complicated to explain who I may be representing,
6 and so I am not representing anybody.

7 But I want to suggest that risk and
8 probabilities, and impacts, are subjective in terms of
9 the Western Shoshone. We are not affected in the same
10 way that the non-native community is, and those
11 impacts may be much deeper.

12 And the way that we respond to these
13 situations may be uncharacteristic of what people
14 would expect. We use different heuristics to
15 determine what our approach to the problems are.

16 And I guess what I am getting to is how
17 can you assure public confidence and know that you are
18 meeting the needs of the particular community? How do
19 you communicate that?

20 I really don't have confidence and I
21 didn't get an invitation. I probably got a notice,
22 but I get a lot of mail anyway. The point is how do
23 you expect to achieve confidence from native
24 communities, and specifically since they are on rail
25 routes and highway routes.

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1 And I think that is about it. And, oh, I
2 have a good scenario, too. Near my community, there
3 is an oil refinery right on the turn, and I can
4 imagine that truck going straight into those tankers
5 and then setting off the 25 oil wells in the valley on
6 fire. How do you respond if it can't take the heat?

7 FACILITATOR CAMERON: So to speak, and
8 that is similar to the special case in Nevada that Bob
9 talked bout earlier about the aircraft overflight.
10 How do you take into account those special situations.

11 And I think that you are reinforcing what
12 we heard from John, and Bonnie, and Calvin this
13 morning about the special circumstances of the Native
14 American communities. So, thank you, Ian. And it is
15 something that the staff is going to have to address.
16 Any other questions? Yes.

17 BROTHER MUIR: My name is Brother David
18 Muir (phonetic) and I am a member of the Franciscan
19 community here in Las Vegas. Our Franciscan community
20 has been here since the late 1960s, 1968, and I have
21 been here myself for the last 6 years, but we have had
22 Franciscan sisters, and brothers, and priests, who
23 have lived here and been very concerned, and
24 understand very well the horror of radiation.

25 And so we come from a very deep place in

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1 this work. Sister Rosemary and Sister Clorita, who I
2 know Judy has worked with before in the past, back in
3 the late '70s came out and they moved to Las Vegas,
4 and they discovered the study of the downwinders in
5 Utah.

6 And they started collecting stories of
7 those people. If you talk to people in Japan who have
8 experienced the nuclear bomb dropped down upon them,
9 they are very anti-nuclear. They know the horrors of
10 it.

11 This community of Nevada understands the
12 horrors of radiation. So you should expect to get a
13 more stronger critique, and more challenged, and it is
14 kind of disconcerting for me to hear our
15 representative from Nevada on how he has been treated
16 in this process.

17 I mean, he is representing people from our
18 State who have a deep history and a deep concern, and
19 I would hope that the authorities on the Federal level
20 and from other States would take to heart the concerns
21 of our representative here.

22 So I am glad to hear of these upcoming
23 face-to-face meetings, and the hope and the concerns
24 of many of us is that they are not just public
25 relations show, which maybe has been the case in the

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1 past sometimes.

2 That there really will be dialogue, and
3 listening to the public's concerns. So for those of
4 you who are not from Nevada, I hope that you take to
5 heart the extra concern of the people of Nevada, and
6 our neighbors in Utah, too.

7 We have worked with downwinders, like
8 Claudia Petersen and Sean Charge (phonetic), and we
9 have worked with Terry Tempest Williams in Salt Lake
10 City. We have had actions out at the Nevada Test
11 Site, and some of our friars have been arrested for
12 non-violent protest at the Nevada Test Site because we
13 come from a deep place.

14 We know maybe more deeply the horrors that
15 can await our human beings that we live with here, and
16 this is a very serious issue. So if we ask for
17 stronger casks, it is coming from some of that
18 personal experience and knowing people who have died
19 and suffered with exposure to radiation, and we maybe
20 know better than most of the rest of the country of
21 that potential horror.

22 So we ask that all casks be tested and
23 explore the failure limits. At what point does the
24 cask no longer hold the material, and we hope for a
25 testing program that is meaningful.

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1 Test and licensing rules that connect to
2 the real world, actual potential accidents that could
3 happen. And I am just really grateful that this kind
4 of meeting is taking place, and from what someone
5 tells me who has been to many of these meetings that
6 this really is a good example of a good faith effort
7 to have some honest dialogue and communication.

8 And it is also good to see the democratic
9 process at work, and we try to use it to help the
10 homeless in this community and going to many meetings
11 like this, and some good can come out of it. And I
12 have been to other countries where this kind of
13 dialogue doesn't happen.

14 But I think when we can respectfully
15 disagree, and try to understand our opponents, that
16 some really good things can come, and a better world
17 for us and for our future. Thank you.

18 FACILITATOR CAMERON: Thank you. Thank
19 you very much, Brother. Yes, Lisa.

20 MS. GUE: Well, Chris, I guess I want to
21 make this 3 for 3, and take exception once again to
22 the conclusion listed on your presentation that no
23 radiation was released as a result of this fire.

24 It turns out that this study was to
25 examine specifically the effects of the Baltimore fire

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1 on the canister or on containment in the cask, and we
2 can assume that had this study included this that the
3 shielding would have failed probably completely as a
4 result of those kinds of tests.

5 So even if this cask as a result of
6 complete shielding failure were within the regulatory
7 accident conditions, the actual radiation released
8 from that cask after the fire would have been at a
9 rate of one rem per hour from one meter, which is
10 significantly more than zero.

11 I don't question the importance of
12 studying the effects of fire on containment. That
13 definitely is very important. What I do question is
14 the presentation of a conclusion in such sweeping
15 general terms without reference to the specific
16 constraints of the parameters being studied, or the
17 hypothesis being tested.

18 And the fact that this is being presented
19 as a basis for the fire test proposal and the package
20 performance study certainly gives us grave concern
21 about the direction of the package performance study
22 as well, and how the potential results of this study
23 would be interpreted, and would be presented.

24 And I am saying that against the backdrop
25 of our experience, where the NRC and Sandia have

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1 allowed video footage from old tests on how obsolete
2 casks to be widely misused by the nuclear industry and
3 the Department of Energy in promoting nuclear waste
4 transportation schemes.

5 So I guess I don't want to have to be in
6 the same position that I find myself in now in 2005
7 when these studies are completed, following you folks
8 around the country to repeatedly type up that in fact
9 the facts and conclusions that you are putting forward
10 are only applicable to the more constrained hypothesis
11 that was being tested.

12 If this study is to go forward in the
13 limited framework that has been proposed, we need to
14 know in the presentation of eventual conclusions
15 clearly what the parameters were, and what the
16 artificial constraints were on those studies, and how
17 it does -- to what extent it does and to what extent
18 it doesn't relate to an actual accident scenario.

19 FACILITATOR CAMERON: Okay. Thank you.
20 It is similar in a sense to what Diane raised earlier
21 about really explaining what we did not do, but
22 explaining any of the constraints or not making this
23 more applicable than it seems. Is that the point that
24 you are trying to make or that you are making?

25 MS. GUE: Yes. My point is that the

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1 conclusion that is needed is not accurate.

2 FACILITATOR CAMERON: Okay. For the
3 record, the point is that the conclusion is
4 misleading. All right. Yes, sir.

5 MR. TITUS: I am Robert Titus, a native
6 Nevadan. My background is engineering and
7 atmospheric science, with 30 years at the Nevada Test
8 Site, and I am proud of it. I have one question and
9 a comment.

10 The man from the Department of
11 Transportation, how many tunnels are there on the
12 rails that lead from where you have to move the waste
13 to its repository?

14 MR. BOYLE: I have no idea how many
15 tunnels there are in America.

16 MR. TITUS: I am not talking about
17 America. I am talking about the railroad tracks that
18 lead to --

19 MR. BOYLE: I have no idea. I couldn't
20 tell you.

21 MR. TITUS: I would guess that there
22 aren't very many, and my comment is that I have been
23 sitting here all day listening to questions and
24 statements that range from the expert through the
25 inane, to the ridiculous.

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1 I have heard Mr. Halstead and some of the
2 others jousting at scenarios whose probabilities are
3 probably a couple of orders of magnitude lower than
4 getting hit by a meteorite.

5 Everybody here should realize that 99.99
6 percent of the nuclear waste is going to be moved from
7 A to B in casks with no problems. And if you do have
8 accidents, then there is a range of accidents.

9 So the probability of some of these ideas
10 of an airplane hitting a truck in transport, or
11 something like that, is completely out of the
12 envelope. If that happens, it is one in a quadrillion
13 sort of an accident.

14 And to try and base your design on things
15 like that is utterly ridiculous. The costs are going
16 to be prohibitive for what you gain, and that is my
17 comment.

18 FACILITATOR CAMERON: Thank you, Mr.
19 Titus.

20 MR. ZABARTE: I am not a statistic if I am
21 involved.

22 MR. HALSTEAD: I don't have the exact
23 numbers, Bob, but if you give me your mailing address,
24 as I recall, DOE a very good study identifying the
25 tunnel locations on the routes that could be used.

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1 And the number is somewhere between 7 and
2 12 in Nevada. I don't know nationally. And a number
3 of them are unfortunately in locations where you have
4 steep grades and sharp curves in the area between
5 Uvada and Muwapoa on the Union Pacific main line.

6 And to DOE's credit, they have identified
7 them, but I don't know if they have factored them in
8 to their risk analysis, but we would be happy to send
9 you the information that we have on the tunnels.

10 FACILITATOR CAMERON: Okay. Let's go to
11 Tom and Diane, and then we will go back out to the
12 audience. Tom.

13 MR. DANNER: I just have a quick response
14 here on the neutron shielding material relative to the
15 fire accident condition. I know that was not part of
16 the study. the analytical approach was to represent
17 what was going on with the fire.

18 But the material performance of the
19 neutron shielding material in the high storm was very
20 similar to neutron shielding material that we use in
21 our cask, which is NS4FR. It is the same material
22 that was studied in the GA-4 and 9 casks that were
23 mentioned here earlier.

24 And that material was studied under fire
25 conditions in the early '90s, and presented at PEPTRAM

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1 in '92, I think. And the performance material under
2 the fire condition was that only 6 percent of the mass
3 of that material was lost during the fire.

4 The neutron shielding material on the cask
5 is about 4 to 5 inches thick, and that means that over
6 the condition or the life of this fire that you would
7 have only lost maybe the outer inch of material. And
8 the result is very, very little relative to the actual
9 shielding impact.

10 MR. HALSTEAD: Can we get a clarification?
11 Is that the regulatory fire, or Tom, was the fire run
12 --

13 MR. DANNER: It was a regulatory fire.

14 MR. HALSTEAD: Right. I don't know to what
15 extent our analysis of the Baltimore fire is the basis
16 of people's comments on this, but the concern there is
17 -- and first off there was also some confusion on the
18 casks and whether we are talking about water jackets
19 or these solid resin or polypropylene shields.

20 But I think that is possibly an issue of
21 concern in the longer duration fires. I respect what
22 you are saying about the regulatory fires.

23 FACILITATOR CAMERON: All right. Diane.

24 MS. NIELSON: Just to quickly pin down the
25 specifics of the aircraft crash. In the private fuel

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1 storage hearings with the State of Utah, there was
2 extensive testimony last summer, and the transcripts
3 are publicly available, and now the decision of the
4 Atomic Safety and Licensing Board is available on the
5 NRC website, some 220 pages of it.

6 In fact, the determination was that it is
7 creditable, and that there is a creditable accident
8 scenario for an F-16 crashing into the storage site in
9 Skull Valley, but that storage site, in addition to
10 including casks on a cement and soil pad, also include
11 the canister transfer building, and the rail line or
12 rail access and road access into the site.

13 The contention was that it was not a
14 credible accident and that is one in a million. The
15 finding of the Atomic Safety and Licensing Board was
16 that it was at least four-fold, and so there is on
17 record a decision by the Atomic Safety and Licensing
18 Board that an F-16 crash into a facility that would
19 include a rail and road transport is credible.

20 FACILITATOR CAMERON: Okay. Thank you,
21 Diane. For those of you who don't know our website
22 address, it is www.nrc.gov. And if you probably go to
23 the Atomic Safety and Licensing Board, it should be
24 fairly easy to find.

25 MS. NIELSON: The faster way is to go to

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1 deq.utah.gov. You will see a listing on the home page
2 or down under the icon, for high nuclear waste storage
3 opposition, and the documents available there in PDF,
4 as well as the new releases.

5 FACILITATOR CAMERON: Great. Thank you.
6 Thank you, Diane. Cash, did you have something that
7 you wanted to say?

8 MR. JSASCZAK: I spent 30 years in the Air
9 Force, and I flew the F-16, and I have been party to
10 the conversation here and I am not going to take any
11 exception to what my colleague next to me said.

12 But I would then ask you this question,
13 and I do know this with some certainty, is that the
14 Air Force in this case was extremely reluctant in any
15 case to change any of its procedures, operating
16 locations, or anything else associated with this in
17 any manner that would have mitigated any of the kinds
18 of things that would have changed the probability of
19 those kinds of an accident.

20 There is competing national priority and
21 there is all kinds of reasons for all various kinds of
22 things happening, and I am not disagreeing with the
23 fact. It is a probable act, but none of the things
24 that would mitigate it or the willingness to give or
25 find solutions appear to have occurred, and that is an

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1 opinion. I don't know anything more than that to be
2 a fact.

3 FACILITATOR CAMERON: Go ahead, Diane.

4 MS. NIELSON: That is a fact. The NRC
5 does not have the authority to require a change in
6 flight plans. In this particular case the transport
7 and storage is directly under the flight path of the
8 Utah Test and Training Range.

9 That clearly is not the typical transfer
10 route or transport route for spent nuclear fuel. But
11 I would contend that if that facility is built it
12 becomes the -- and if the Atomic Safety and Licensing
13 Board decision does not stand, it becomes a very
14 credible situation for us, and a very compromising
15 one.

16 MR. JSASCZAK: I have no argument with
17 that.

18 FACILITATOR CAMERON: And I would just
19 emphasize the fact that the NRC is not going to try to
20 change that situation for the reason that you gave.
21 We don't have any jurisdiction to try and do that, and
22 I guess I will just stop there.

23 MR. HALSTEAD: I just wanted to make the
24 same comment, because it has been raised by Bob Titus
25 earlier, and that is a similar situation with the

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1 situation with the flights on the Groom Lake side of
2 the Nellis ranges, and Indian Springs.

3 We have never said, and in fact if I were
4 writing the analysis for DOE, I would have said, man,
5 you are really right. There is real potential for
6 disaster here. We have got to come up with some
7 administrative controls to deal with it.

8 And there are very straightforward things
9 like scheduling of shipments, and location of the rail
10 line versus flight paths. Now, none of those get you
11 to a complete zero risk, but there are ways to manage
12 those risks, and I think I am agreeing with Bob.
13 Maybe Bob doesn't want to say, but I am certainly
14 agreeing with the comments --

15 MR. TITUS: Well, I think it is credible,
16 but not probable.

17 FACILITATOR CAMERON: We have to get you
18 on the transcript and so you have to speak into the
19 microphone. We are going to go back out to the
20 audience and please introduce yourself.

21 MR. LEVENSON: I am Milt Levenson, and I
22 am here as an observer from the Advisory Committee on
23 Nuclear Waste. I have a simple question that I would
24 like to have clarified in connection with the
25 shielding issue. There is discussion about the

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1 neutron shield, and it may or may not partially
2 disappear.

3 What fraction of the radiation coming from
4 a spent cask is neutrons and what fraction is gamma?
5 I know that a significant fraction is gamma, and so
6 you don't lose all the shielding even if there is no
7 neutron shielding, but what is the ratio?

8 FACILITATOR CAMERON: Tom. Do you have an
9 answer to that?

10 MR. DANNER: I don't have one (inaudible-
11 off microphone).

12 MR. HALSTEAD: I think it is 25 percent on
13 the rail cask, but I can't remember the neutron, but
14 I don't remember the number on the truck cask.

15 MR. DANNER: I can't tell you that ratio
16 split right now. Most of it is gamma. That's true.

17 FACILITATOR CAMERON: We really need to
18 get this on the transcript, okay? All right. Other
19 comments or questions?

20 MS. TILGES: Chip, he said he was with the
21 Advisory Board on Nuclear Waste. Whose advisory
22 board?

23 FACILITATOR CAMERON: Oh, good point.
24 Good point, Kalynda. For those of you who don't know,
25 the NRC has a number of independent advisory boards

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1 that advise the staff and the commission on the
2 actions that we are taking, and in fact the Advisory
3 Board on Nuclear Waste is one of those boards, and why
4 don't we have the other member from the ACNW introduce
5 himself.

6 MR. KOBETZ: I am Tim Kobetz, and I am on
7 the staff for the ACNW. Do you want me to explain
8 what we do briefly? All right. We are set up by
9 FACA, which if you don't know is the Federal Advisory
10 Committee Act, but we provide information specifically
11 to the Commission.

12 The advisory committee reports to the
13 Commission and gives them an independent view of what
14 the NRC is doing on different issues. Transportation
15 is one of them, and the Advisory Committee on Nuclear
16 Waste was set up specifically for Yucca Mountain
17 issues and transportation issues, and that kind of
18 thing.

19 So we do not necessarily work with the
20 staff, the other NRC staff. We give independent views
21 to the Commission on what they are doing, good or bad.
22 We have already commented on PPS earlier providing
23 comments on these kind of things, or actually Milt
24 did. And Milt is the lead transportation person.

25 MS. TILGES: Thank you.

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1 FACILITATOR CAMERON: And I think that
2 there is a website for the ACNW where you could go to
3 to see when they are going to have meetings, and what
4 products there are.

5 MR. KOBETZ: Yes, there is. You just go
6 right into the NRC website and you can track your way
7 to the ACNW through the organization.

8 MR. LEVENSON: The ACNW has commented
9 officially, which means that the letter is public, on
10 an original draft of the PPS, and in fact briefed the
11 Commission in a public meeting, like some of our
12 others, and I think that was one of those that went
13 out live on the internet.

14 So if some of you feel that you are in a
15 fish barrel here, you should be sitting in a meeting
16 that is going out live on the internet.

17 FACILITATOR CAMERON: Thank you. Other
18 questions or comments from the public? We will come
19 back out again. Carlos.

20 MR. LOPEZ: Carlos Lopez from Sandia
21 National Labs. I would like to invite everybody here
22 and anybody that will most likely read the transcript,
23 to think through the problems or the type of accidents
24 that they want to postulate, and please give us
25 feedback to the PPS protocols in the way that have

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1 been mentioned, and sending comments directly to the
2 NRC website, or writing directly to us.

3 And with some rationale behind -- and the
4 reason that I say this is because Bob Halstead
5 mentioned before that NTSB is likely to go back to the
6 investigation of the tunnel fire, and I just want to
7 say that NTSB looks for the reasons of the accident,
8 and not the consequences of the accident.

9 So it could be a little bit misleading
10 just saying that because things are not clear, in
11 terms of the fire environment, that the NTSB is going
12 to look at the accident again.

13 They may not have a very good reason why
14 the accident happened, instead of trying to correct
15 the fire, which they won't do. And also he mentioned
16 the high speed wind scenario, where you possibly burn
17 hotter given a pool fire, and the problem there that
18 I would say is that it is harder to engulf a large
19 object and expose it to this higher temperature for
20 long durations.

21 And I just throw that out just to say
22 please comment back. We want to make this the best
23 that we can. The analysis that is currently in the
24 protocols is just an example or just preliminary
25 analysis to give you an idea of the things that we can

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1 do, and we are looking at different things other than
2 the regulatory positions, and certainly we can
3 consider upset fires as well.

4 But keep in mind that when it comes to
5 real live testing that it is very hard to achieve
6 those postulated cases, and you can dream of many,
7 many cases, but can you test that. Can you predict
8 that with a code. I think it is important to keep
9 that in mind. That is my point.

10 We want to do a test that is severe, but
11 we also want to be able to model, and to model it, we
12 need to understand the environment, and postulate it.
13 It is only good practice to postulate the problem well
14 enough so that it could be well analyzed.

15 And just as you mentioned before, with
16 everybody knowing the conditions, and the knows, and
17 they can do the analysis themselves, and hopefully at
18 some point we can come up with an agreement, instead
19 of different people making different assumptions, and
20 of course we are going to come back with very
21 different answers.

22 And I am all for the meeting that has been
23 mentioned before on the tunnel fire, and getting very
24 technical about it, because it is necessary to
25 understand what you guys seen, or I shouldn't say

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1 that, but rather what people mean when they say that
2 it could have been more severe than the regulatory
3 fire.

4 And just one last point. I just want to
5 say that an accident that appears to be worse than the
6 regulatory environment is not necessarily worse than
7 the regulatory environment. Appearances is something
8 else. You need to talk about technically how much
9 heat you are putting into the cask, and for the fire,
10 how much energy you are putting into a cask for a drop
11 test, or impact test.

12 That is part of the reason that we do drop
13 tests, or we are suggesting a drop test without a rail
14 car, or a truck, and to basically pose a harder
15 environment for the cask, and trying to come up with
16 an agreement with what people want to see. Thank you
17 very much.

18 FACILITATOR CAMERON: Thank you, Carlos.

19 MR. HALSTEAD: If I can respond. First of
20 all the NTSB's mandate. It is an independent board,
21 and it investigates accidents and incidents, and it
22 does make recommendations to regulatory authorities
23 about how to prevent them from recurring. That said,
24 that is mostly to DOT.

25 The specific issue with Dr. Berkey is that

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1 he prepared a somewhat scathing critique of the NIST
2 report for us two weeks ago. I was looking forward to
3 having him speak publicly at the meeting last week.

4 What the NTSB asked him to come back and
5 work on were two things; the causes of the Baltimore
6 fire, and also the tile failure on the Columbia
7 Shuttle. He had previously been a member of the board
8 investigating the Challenger.

9 Now, we told him right off that the
10 national interest seemed to us that it was more
11 important for Dr. Berkey to go back to the NTSB than
12 honor the contract with us that he was holding.

13 And we are now trying to work out a
14 negotiated settlement with the NTSB that allows Dr.
15 Berkey to advise us on advising you on the development
16 of the fire test protocols, but having him not comment
17 further on your Baltimore fire report, as that seems
18 to have a clear conflict of interest with his
19 responsibilities in advising the Board.

20 And he is a very distinguished fire
21 scientist, and we were privileged to having him
22 advising us, and under the circumstances, we decided
23 that we would not lean on the contractor to work for
24 us, because of the necessity of him doing other work.

25 I do hope that we will be able to have his

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1 expertise on the more important issue here, which is
2 developing good fire test protocols.

3 FACILITATOR CAMERON: Okay. John, and
4 then we are going to go to Andy to tee up the impact.

5 MR. HADDER: A couple of brief things.
6 Obviously the controversy over the Baltimore tunnel
7 fire and the modeling clearly underscores the need for
8 a full scale physical testing of this concept.

9 I mean, certainly modeling as we all know
10 as assumptions, and there is differences of opinion
11 over what variables and how they should be used.
12 So this underscores the need for getting real data to
13 support the best way to do modeling in the future.

14 So I think that is one of the bottom
15 lines. The other point that I wanted to make or the
16 other thing that I had not heard yet, but in terms of
17 a fire test I was wondering if the NRC had been
18 considering looking at inhomogeneous fire as part of
19 the cask itself.

20 The document handed out sort of showed
21 images of an engulfing fire, and where the heat was
22 distributed rather symmetrically in the cask, and I am
23 concerned that that overlooks the possibility that an
24 asymmetric heat could create stresses inside the case
25 that might breach it under different conditions. So

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1 I just wanted to put that out there as another
2 variable to consider.

3 FACILITATOR CAMERON: Thanks, John, and
4 before we do the break, and I don't think I can repeat
5 what or how you termed it, Andy, but we have one more
6 comment. Cathy.

7 MS. CORPOUS: My name is Cathy Corpous,
8 and I am with the Peace Foundation, and I work with
9 Kalynda and several other groups in town. Essentially
10 public safety is number one here, but I have not heard
11 once about what this waste transportation is doing to
12 the earth, the land, the air, the water.

13 Now, let me tell you that there is a lot
14 of indigenous animals and plants disappearing due to
15 this at the Nevada Test Site, and I am sure, and i am
16 quite positive that if these casks are not testified
17 properly that the transporting of them will have major
18 detrimental effects on the environment. And I just
19 thought I would say that and that's it. Thank you.

20 FACILITATOR CAMERON: All right. Thank
21 you, Cathy. Then let's take a break and we will
22 resume at 6:30.

23 (Whereupon, at 6:15 p.m., the meeting was
24 recessed.)

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E V E N I N G S E S S I O N

(6:33 p.m.)

1
2
3 FACILITATOR CAMERON: Okay. A couple of
4 announcements. One is that we are going to adjourn at
5 7:30, unless we get done earlier, and we probably
6 won't. But we won't keep you here any longer than
7 7:30.

8 We want to accomplish two things. One is
9 to keep some feedback on the impact part of the
10 protocol, and I am going to ask Andy Murphy to tee
11 that up.

12 And secondly, we just want to make sure
13 that if anybody is here who wants to comment, and who
14 wants to ask questions, we will go out to the audience
15 before we close. Andy, go ahead.

16 DR. MURPHY: This is going to be a quick
17 and short tee-up. I think that a lot of the things
18 that we had wanted to discuss as far as the impact
19 testing, we have touched on fairly significantly
20 today.

21 So I am just going to read off those
22 bullets up there and say that the staff has proposed
23 the speed range that we are interested in testing the
24 casks for impact is between 60 and 90 miles an hour as
25 a range.

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1 The range was developed looking at the
2 Holtec cask, and that we have to obtain a velocity of
3 about 60 miles an hour before we have fully engaged
4 the impact limiters, the shock absorbers, the honey
5 comb boxes.

6 Below that speed, basically we are just
7 testing the impact limiters, and it is the casks that
8 we want to test. The 90 miles an hour came from
9 looking at the statistics, and again that 6672 thing.

10 The numbers there, when we look at a 90
11 mile an hour train accident into a hard surface, that
12 occurs about once in 10 to the minus 8 or 9, and
13 statistically a very infrequent accident. So we
14 selected this range.

15 The staff took a look at this a little bit
16 more carefully, and decided that we were going to
17 propose a 75 mile an hour accident into an unyielding
18 surface, which we indicated this morning basically has
19 the effect of doubling the speed as far as the kinetic
20 energy dissipation, as opposed to going to a yielding
21 surface.

22 The type of impact test that we are going
23 to do is a drop and our initial options were either a
24 drop or mounting it on a rocket sled. We decided that
25 the rocket sled had enough uncertainties associated

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1 with it that the drop, which depended upon gravity,
2 which is sort of an unchanging quantity, would give us
3 a better technical engineering test.

4 We decided -- and when I say decided, I am
5 not saying that we made the decisions already, but we
6 had to do something as far as our proposals. We had
7 decided to propose, and that's what I mean, and I will
8 slip into it all day and have done it all day, that
9 for the orientation of the cask, our proposal was that
10 the Holtec cask would be dropped in a center of
11 gravity over corner, the lid corner, at an angle.

12 And as the figure that Ken showed you this
13 morning would imply, and that the GA-4, the truck cask
14 would be done in a back breaker orientation, which
15 bypasses the impact limiters, in some sense similar to
16 an accident that might occur if the cask came off the
17 conveyance, and hit a bridge abutment, or a bridge
18 pier; obviously a very strong bridge abutment or a
19 bridge pier.

20 Those are the basic proposals, and I will
21 turn it back to Ken, or turn it back to Chip to begin
22 the dialogue up again.

23 FACILITATOR CAMERON: Thank you, Andy. Do
24 we want to just ban Bob Halstead from speaking for the
25 rest of the time? All right. Let's start with Mike.

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1 And, Mike, at this stage of the game, you can start
2 anywhere that you would like with this.

3 And let's try to get some reaction to what
4 Mike suggested, and what Bob suggests, as well as your
5 own comments. Mike.

6 MR. BAUGHMAN: I am looking at figures 41
7 and figures 46 in the document, and I guess these two
8 figures illustrate the cask without the impact
9 limiters on it, and it appears that those are not
10 included on here.

11 So maybe there is a test like this with
12 them on, but here is my point. I want to get back to
13 this issue of realism, and we have talked about
14 realism before, and it seems to me that specifically
15 for the back breaker scenario of the test that a --
16 and I am a little concerned about when this comes off
17 the truck.

18 And so let's assume that we have a back
19 breaker test where the cask is actually attached to
20 the trailer, but it hits the pillar in the same
21 configuration as we are shown in figure 41.

22 Now you have got the weight of the
23 trailer, and you have got the cask actually mounted
24 into that trailer, and I don't know how all the
25 physics work, but it seems to me that it is not as

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1 likely to bend in the way that it is showing here.

2 Because now you have to wrap the trailer
3 around it as well, and I don't know this for sure.
4 But it just strikes me as though that we ought to
5 consider that these things don't always leave the
6 truck.

7 And in fact in this case that the trailer
8 does add to the potential impact of the cask, rather
9 than detract from it. I don't see even how in the
10 back breaker scenario, I don't see how the trailer
11 necessarily has to act as a cushion if you will.

12 So I throw that out for consideration, and
13 I am just looking for realism, and I hate to think
14 that every time these things crash that it is going to
15 fall off, because if it does, it is going to be a lot
16 longer before it gets dealt with perhaps.

17 DR. MURPHY: That is a good point. We had
18 not specifically looked at that. To drop back a
19 little bit, the impact limiters are not shown on here
20 as they appear on the outside of the truck, but the
21 weight and the masses were taken into consideration.
22 I believe that they are illustrated by the little
23 yellow and the gray thing on the end.

24 But we will take that and look at that,
25 and potentially what the conveyance would do to change

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1 the physics at this stage.

2 FACILITATOR CAMERON: Thank you. I didn't
3 mean to cut you off. Are you done?

4 DR. MURPHY: Yes.

5 FACILITATOR CAMERON: All right. Let's go
6 to John, and then we will go down this way, and then
7 we will go to Kalynda.

8 MR. KESSLER: We have not taken very much
9 of a look at it yet, but we look at it from the
10 probability grounds, and I think from what I am going
11 to say that a factor of three is not going to make
12 much difference in terms of where we came at it.

13 We looked at the Appendix A stuff, and in
14 there you would look at the statistics and say that a
15 60 mile an hour impact on essentially something that
16 looks like an unyielding surface, with no speeds, et
17 cetera, is like 10 to the minus 6 per year, with
18 however many casks you think you are running, and that
19 90 was 10 to the minus 8.

20 I appreciate that that is an approximate,
21 and you noted that is pretty low, and especially the
22 10 to the minus 8, and you said, well, you can compare
23 that to Yucca Mountain, and transportation casks can
24 run closer to population centers, and that is true.

25 I think that what we are concerned about

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1 is that you could do a lot more analysis to do a
2 better apples to apples comparison here, and if you
3 have other nuclear facilities that are located closer
4 to population centers than Yucca Mountain, you could
5 have looked at more than just comparing to Yucca
6 Mountain. You could have looked at reactors, for
7 example.

8 You could have looked at what the NRC
9 allows for core damage frequencies, and then what that
10 might lead to in terms of an early release fraction.
11 I'm sorry for getting technical.

12 But the idea is that you need to look at
13 where the container is, and what you allow for, for
14 other risks of accidents, and look at what those
15 relative releases are.

16 So you might want to compare relative
17 releases and relative doses to come up with a better
18 argument, at least in risk space, as to why 60 and 90
19 are reasonable.

20 When we took a quick look at it, we were
21 convinced immediately that 90 was unreasonable, at
22 least compared to when we look at both reactors and
23 Yucca Mountain.

24 And the 60 is definitely borderline, and
25 we think it is not just 60 miles an hour, but it is 60

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1 miles into an unyielding surface. And when you add
2 then on top of that probability of release and compare
3 that to releases from other kinds of nuclear
4 activities, we are still thinking that 60 miles an
5 hour is way conservative.

6 FACILITATOR CAMERON: Okay. Thanks, John.
7 And everybody feel free to comment on what they hear
8 from the panel. Judy.

9 MS. TREICHEL: I would like to propose
10 that you test with impact limiters and then without,
11 because that gives you a way of testing the impact
12 limiter, and what a good job it does.

13 But as I remember from some of the old
14 films with the '77 Sandia test, when the thing hit the
15 wall, it jumped out of its cradle and its impact
16 limiters. It just sort of became a missile by itself.

17 And then it did its drop or hit, or
18 whatever it did after it flew out. So it seems like
19 it could be tested first with the impact limiter, and
20 then without.

21 FACILITATOR CAMERON: Go ahead, Andy.

22 DR. MURPHY: I would like to make just a
23 simple quick comment here. We have gotten maybe two
24 conflicting ideas going on. The first is that we are
25 talking about potentially doing test to failure, and

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1 we will have to figure out what that means.

2 But are you in this particular instance
3 suggesting that we do an impact limiter test to
4 failure, and then a non-impact limiter test to
5 failure?

6 MS. TREICHEL: No, I think you should save
7 the thing -- when you are doing it with the impact
8 limiter on there, you are pretty much testing the
9 impact limiter. And when you watch that truck run
10 into the wall in the old Sandia test, you see the
11 engine, and the cab, and everything is just sort of an
12 accordion pleading on up through the impact limiter.

13 And by the time that the cask actually
14 frees itself and takes off, a whole lot of that crash
15 has been absorbed by other things. So you are really
16 testing the other stuff, rather than the cask in that
17 one.

18 DR. MURPHY: Okay. I will say that is
19 potentially a different scenario than what we had been
20 thinking about if you are talking about test to
21 failure with or without an impact limiter. And now
22 you have added the condition of adding the conveyance.

23 So if you are going to make the comment to
24 us, we need to have the full details of the test that
25 you are suggesting, okay?

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1 MS. TREICHEL: Okay. Yes.

2 FACILITATOR CAMERON: All right. And we
3 are going to go to Fred and Bob, and I would just ask
4 everybody to keep in mind what John said about the --
5 at least in risk space, looking at the 60 and 90 miles
6 per hour, that the 90 is really outside of its -- it
7 is not risk informed.

8 (Discussion off microphone.)

9 DR. MURPHY: It does not seem precedented
10 in terms of what the NRC has thought about before.

11 FACILITATOR CAMERON: Okay. And Fred, or
12 Bob, or anybody else who wants to comment on that as
13 well as your own comment? I want to try to give the
14 staff a feel for how other people think about that.
15 Fred.

16 MR. DILGER: First, let me just say that
17 I think that the rocket sled idea can be discarded out
18 of hand. I think we talked about that a lot, and that
19 is a dangerous, risky, hard to control, way to test
20 these things.

21 And I think that dropping it is probably
22 the safest, and best, and smartest way to do that. In
23 terms of the orientation of the cask, as I understand
24 it, and please confirm this for me, but the center of
25 gravity over the lid cover, that is the test proposed

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1 for the rail cask; is that correct?

2 DR. MURPHY: That is correct.

3 MR. DILGER: And then the back breaker is
4 the truck cask.

5 DR. MURPHY: Yes.

6 MR. DILGER: Okay. The center of gravity
7 over lid covers, first, these are both extremely tough
8 tests. I think that testing these without impact
9 limiters would be fine. In terms of the speed, Bob
10 will make arguments for higher speeds, and I think
11 that those are reasonable arguments.

12 However, the lower speeds are also fairly
13 reasonable, and are reasonable, too, and I just am
14 going to have to waffle on this and not give you any
15 answer on the speeds tonight because I have to think
16 about it some more and look a little bit more at some
17 data before we go forward.

18 Second, in terms of the back breaker, I
19 have said this before, but this is a very -- this is
20 a really tough test that you have crafted here. If we
21 were looking at realism, I would buy a highway
22 abutment and put a highway abutment into your
23 unyielding surface and drop the cask on a highway
24 abutment to give you the most reasonable test.

25 I don't know of any highway abutments that

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1 are sheaved in steel, and I think that you would still
2 have a very good and very credible test. And if there
3 is a better way to do it with a steel sheave, I am
4 certainly open to hear what that might be.

5 DR. MURPHY: The sheaving of highway
6 abutments is going on routinely in California now for
7 seismic conditions.

8 MR. DILGER: Well, that is a great answer.

9 FACILITATOR CAMERON: All right. Good.
10 Bob.

11 MR. HALSTEAD: Well, on the drop test
12 versus the rocket test, I think that there are a
13 number of issues of drama that the rocket sled wins
14 on, but in every other regard it seems to me that the
15 drop test is better not only because of the results
16 that it gives from on test, but frankly I can't
17 imagine that it makes sense to build that facility and
18 not use it for other drop tests.

19 And so not only does your learning curve
20 improve if you do subsequent tests, but my goodness,
21 you have got your facility prepared. I was intrigued
22 by Felix Calard's (phonetic) observation with the
23 difficulty of high drops missing the target, and I was
24 not aware of that experience, and maybe you are.

25 So obviously that will have to be

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1 addressed through some testing of the test facility.
2 But I think that there are ways, but we are strongly
3 supportive of the drop test, and I suppose that
4 someone could argue, and we would listen to the
5 argument about the rocket sled, but I just have not
6 heard anything that impresses me about it.

7 A couple of quick points. Regarding the
8 back breaker test for the truck cask, while I stand by
9 the things that I have said in the past pushing for
10 that test, because it represents a severe loss of
11 shielding event, and I think there are reasons that we
12 would want to know about that, we are rethinking
13 whether it wouldn't be better to do an end impact test
14 on the truck cask from the standpoint of assessing a
15 loss of containment.

16 And particularly because it is the
17 combination of the impact on the lid, combined with
18 the fire that a truck cask, because it is a smaller
19 thermal mass required to heat the fuel inside that
20 raises some real concerns for us about the combination
21 of impact and fire that really gives you the kind of
22 failure mode that we are most concerned about.

23 So having said, Rick, all those things
24 that you so accurately critiqued last week about the
25 elegance and the creativity of the back breaker test,

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1 it is possible that that isn't the test that we should
2 do from the standpoint of trying to find the failure
3 threshold.

4 Regarding the impact limiters, I know that
5 you guys don't have a lot of time before next week's
6 meeting, nor do we, but it would be really useful if
7 you had already done this analysis or can do it. If
8 you would give us some equivalency information on
9 whether it is expressed in G-impacts, height, speed.

10 Tell us what the end drop tests might look
11 like, the heights, if you did the tests without the
12 impact limiters, and to put the same amount of strain
13 on the cask that you do with the impact limiters, so
14 that we can assess that in relation to our own desire
15 to give you a counter-proposal, where we combine a
16 regulatory drop test with a fire test, where first as
17 Jim Channell said that we go to the regulatory
18 duration of the fire, and then we run the fire out.

19 There is a real possibility that there is
20 some economy in doing the test that way, but it would
21 be helpful to us to see some numbers from you on how
22 we would do the drop test without the impact limiters
23 representing the same G-forces being there.

24 The impact of a severe or the implications
25 of the impact test for installing the instrumentation

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1 that you would use in the fire test remains a great
2 concern to us, and we would hope that you could come
3 back and give us some ideas about frankly what your
4 basis is for assuming that there are thermal couples
5 and connections, or reports for them that would
6 survive, particularly the 90 mile per hour test, and
7 I think that might be relevant.

8 But I think the greater the impact that
9 you put on the cask, the greater concerns we have
10 about the instrumentation. Now, you may have a
11 different strategy, but our strategy for the fire test
12 was either to have the cask manufacturers install the
13 thermal couples in the delivered casks.

14 Certainly they have the capability to do
15 that at Sandia, and so it could be done right away.
16 But that is an issue. And I guess we still need to
17 think about the speeds and the impact orientations
18 that we want to give you for test-to-failure.

19 But I will say that while that is an
20 important issue that is a lower priority to us than,
21 one, the regulatory tests of the full-scale test, and,
22 two, the extra regulatory fire test.

23 And now if I had to choose between a
24 regulatory impact test, followed by an extra
25 regulatory fire test, or some combination of an extra

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1 regulatory impact test and a fire test, I think I
2 would be inclined to try to go with the first
3 combination. Anyway, that is our thinking at this
4 point. Okay. Thank you, Bob. Kalynda.

5 MS. TILGES: It is going to be difficult
6 for me to go into details, again not being a very
7 technical person, but just to make it kind of slow and
8 simple, as far as the appropriateness of the speed, I
9 don't want to get into unyielding, and yielding, 75 or
10 90 miles an hour.

11 I simply want to say that we believe that
12 the impact tests should be done at the highest
13 possible speed that either the train or the truck
14 could be traveling, and also the highest possible
15 speed of a runaway train or a runaway truck. What
16 those speeds are, I don't know. Hopefully I won't get
17 the answer in wattage.

18 But as far as the reasonableness of this,
19 as far as we are concerned, it doesn't matter to us if
20 the likelihood is small. If there is any possibility
21 at all for any of these things, it should be tested
22 for.

23 And also as far as whether it should be
24 dropped from a tower, or a roof of a building, or an
25 impact test, frankly do them both. Do them all. Let

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1 me give you what I consider a real world situation
2 that might help explain what I am talking about having
3 lived many years in the Lake Tahoe area and still
4 having family up there.

5 But let's just assume that we have a cask
6 on a truck traveling over a high mountain pass, and
7 unexpectedly the weather turns and the road becomes
8 icy or wet, and slippery. The truck jackknifes, and
9 got forbid, it falls over the mountain and hits a
10 jagged granite rock, and then bounces off of that, and
11 hits another one, and then another one.

12 And the truck bursts into flames, and it
13 lays there for hours, and hours, and hours, before
14 anybody, if anybody, can get to it. Those are the
15 kinds of tests that I am talking about.

16 Those are the kinds of things that could
17 really happen and have happened. So we are talking
18 about -- these seem to me to be very simple, very
19 logical things to do. And again Shundahai will be
20 presenting or putting more details in writing. But I
21 can't get down to speed. I am just talking about
22 reality checks here on this.

23 FACILITATOR CAMERON: Okay. Thank you,
24 Kalynda. Is my impression wrong that the staff has
25 much less to do in terms of this impact test part of

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1 the protocol than they have to do on the fire tests?
2 Bob?

3 MR. HALSTEAD: Well, it is hard for me to
4 tell right now what I would like to ask them to do,
5 but I guess I would like to ask for a commitment, and
6 I suppose we have to do this by next week to maybe get
7 something that could be shared with people, and to
8 look at their comments, as a lot of people will be
9 working on their comments in April and May.

10 I guess I would like to see some
11 additional modeling by the folks at Sandia of what
12 types of deformation might occur. I guess one of the
13 things is to take the impact limiters off and give us
14 a range of impacts, and help us -- we have a much
15 clearer idea of how we want to define failure
16 thresholds with fire tests.

17 Again, as I have said, that is a lower
18 priority to us than the impact test, but it would be
19 helpful if you could provide some information. As far
20 as the documents and the discussion of
21 instrumentation, this is a very fine piece of work in
22 the test protocols, in terms of the background issues
23 need to be addressed.

24 And you are to be commended for that, as
25 that is somewhat separate from I think how we feel

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1 about the specific scenario. But in terms of the
2 ability to do the modeling, and the ability to explain
3 what you are analyzing, and the discussion of
4 background issues, in that regard I do think that they
5 have or that they are further along.

6 And also in the fire area, there is a
7 whole lot of discussion on the benchmarking of the
8 cafe (phonetic) code with the large calorimeters that
9 some of us are more familiar with that, though it not
10 completely addressed in your document.

11 So there may be some other documents that
12 maybe we should add to yours. But I would say that
13 the impact testing is better developed. But it still
14 would be helpful if you would help us define how we
15 might model the failure thresholds for impact without
16 fire.

17 I mean, what creates a pathway and what
18 puts a loading on the spent fuel so that we -- I mean,
19 is it possible to have burst rupture without fire?
20 Well, probably not in an MPC, but in a truck cask, I
21 am not so sure.

22 FACILITATOR CAMERON: Okay. Thanks, Bob.
23 Mike.

24 MR. BAUGHMAN: Yes. Chip, you asked about
25 the impact testing, and clearly one of the things that

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1 has to be done is to design and build a new drop test
2 facility, and I would suggest or just offer as a
3 suggestion that as you consider the design and
4 construction of that drop test facility that you also
5 consider that 100 percent of the shipments will travel
6 through my friend's or my neighbors in Nye County to
7 the Nevada Test Site.

8 And I think we would be remiss in not
9 building that facility at the Nevada Test Site and not
10 conducting all of the drop tests in the future at that
11 facility, at the Nevada Test Site, which will allow
12 those of us who are going to be living with 100
13 percent of the shipments the opportunity to view those
14 tests on a more frequent basis, assuming that this
15 facility gets used in the future.

16 FACILITATOR CAMERON: That is an
17 interesting suggestion. Let me see if there is a
18 comment from others around the table on that proposal.
19 Cash.

20 MR. JSASCZAK: Nye County thoroughly
21 endorses that proposal.

22 FACILITATOR CAMERON: All right.

23 MR. HALSTEAD: We think that this whole
24 issue of how the testing facility should be chosen,
25 and where they should be and all, certainly needs to

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1 be discussed somewhere. You know that there is
2 interest in the Congressional delegation in this idea,
3 and it is mentioned in their letters.

4 And so you need to figure out how to open
5 that issue up for us to discuss it. You are talking
6 about a big investment in a facility to do these
7 drops.

8 FACILITATOR CAMERON: Okay. Thanks. Let's
9 go to Peggy, Judy, and then back to Fred on this
10 particular issue.

11 MS. JOHNSON: John had to leave, but I had
12 my instructions before he left to ask this question.
13 He wanted to know if the NRC was considering the slap
14 down test.

15 FACILITATOR CAMERON: Okay. Let me just
16 put slap down right up here in the parking lot. Is
17 there anything else about the location of the test
18 facility? Judy. Go ahead.

19 MS. TREICHEL: Well, I would never go on
20 record as being opposed to having business come to Nye
21 County or to Nevada, but I would suggest that since it
22 was made very clear early this morning that this is
23 not about Yucca Mountain, and this is about testing
24 casks, and about the safe movement of spent nuclear
25 fuel and high level wastes, if it needs to be moved at

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1 any time, any place.

2 That if you have a facility, and I am
3 talking to the testers now, and not the Nye County
4 sales people, that if you select a spot in Nye County,
5 then it would be pretty much like the terrorist test
6 facility that is now in Nye County at the Nevada Test
7 Site, where we are not being targeted for all of the
8 terrorist activities. We are just having the training
9 facility there.

10 So I just want to make it very clear that
11 this is not about Yucca Mountain and that we were
12 assured way long ago this morning that it was not.

13 FACILITATOR CAMERON: Okay. Thank you.
14 Fred.

15 MR. DILGER: Speaking for Clark County, I
16 just would like to say that one of the -- that I
17 believe that one of the NRC's obligations to public
18 safety are going to be exercised with regard to Yucca
19 Mountain or to the private fuel storage facility, most
20 over the coming 40 years.

21 And so I think that our discussions
22 tonight directly do in fact directly relate to that.
23 And we do endorse the idea that a testing facility
24 like this could be profitably located in Nye County.

25 You know, one of the features and constant

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1 features of living in Clark County is the near
2 mandatory trip out to Yucca Mountain to hear the dog
3 and pony from the Department of Energy.

4 And in fact the testing facility out
5 there, there are already a lot of testing facilities
6 out there, and HAZMAT testing facilities, and a lot of
7 others. It makes a lot of sense, and I had not
8 thought about it before this evening, but it is an
9 issue about how and where we test. But it does seem
10 to make a lot of sense to me.

11 MR. HALSTEAD: And this is an important
12 issue, both a Nevada issue and the larger issue of how
13 the final protocols are done, and frankly it would be
14 interesting to hear what your procurement needs are on
15 all of this, and how will all of this be done, let
16 alone how it will be budgeted.

17 FACILITATOR CAMERON: And we won't forget
18 the slap down. Bob, you mentioned one other -- well,
19 when you described an other issue of how Nevada was
20 involved, in addition to this location of this test
21 facility.

22 And I wanted to make sure that we weren't
23 missing any discussion about how after the staff takes
24 all of this material, and gets to a new point, is
25 there a need -- the implication of everything that you

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1 say is that there is going to be a need for further --
2 almost continuing -- dialogue to work out what the
3 best thing is to do. And I don't know if that is what
4 you were referring to.

5 MR. HALSTEAD: Yes. And we certainly owe
6 you a more formal proposal. We discussed it last
7 week, but with the travel and everything, it has been
8 hard to sit down at a keyboard and knock out any
9 words.

10 In addition to calling to your attention
11 the difficulties that we have had with stakeholder
12 involvement, we have been thinking about some very
13 specific ways that we could define the kind of
14 stakeholder involvement over the course of the testing
15 program that we think would be appropriate.

16 And some of it is as simple as costing out
17 the number of meetings you have and the number of
18 meetings. So of it is less straightforward, like how
19 to do the peer review issue with Dr. Bonnie Graves
20 (phonetic), both in terms of how you set up a good
21 technical peer review with a true peer organization.

22 And also how you work into this process
23 some ombudsperson type of representatives, because
24 frankly it just frankly is not going to be realistic
25 to have large numbers of people involved all the time

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1 in working out these details.

2 So Fred and I put some costs in our paper,
3 and we have been beating each other up over costing
4 these things out, and I was only half-joking when I
5 said earlier that we are working from the assumption
6 of excessive public participation in hostile peer
7 review, and that is why some of our numbers may
8 actually be higher than they end up being.

9 But I think we would like to give you as
10 definite a proposal as we can, and we had hoped to be
11 able to do it while you are doing the meetings so that
12 other people could have access to our proposal and
13 perhaps reject it, or propose it in their comments to
14 you.

15 So we will have to work out some way if we
16 can't do it by next week, and we probably can't do it
17 through the website. And we also have some additional
18 documents and things that we would like to have
19 posted.

20 And I want to say a positive thing about
21 the way that Sandia has operated that website. By and
22 large, I think that is a big success, because there
23 are some things that went on there, but we can't find
24 the electronic files, or we can't find a decent enough
25 copy of something to scan for you.

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1 But by and large I think that has been one
2 of the more successful parts of making this
3 information available. I know that it discriminates
4 against people who don't have internet access. So I
5 guess they have to have some back up to provide paper
6 copies on request, and I know that you guys probably
7 do that all the time with your technical reports.

8 But that is where you have been real good,
9 and I guess one of the things that we see as a
10 combination of using internet communications and some
11 formalized public process to ensure that there is the
12 kind of interaction through the completion of testing.

13 FACILITATOR CAMERON: And you guys are
14 going to put something together on that. Okay. That
15 would be useful. Just let me make sure that there is
16 no other process comments before we go to Peggy's
17 slapdown issue. Diane, do you have something?

18 MS. NIELSON: This is a follow-up to Bob's
19 comment, in terms of involving citizens in Utah in
20 this, and we have talked about it a little bit during
21 the breaks, but we also would like to see that sort of
22 interaction, and sharing of information.

23 And once people realize that you are
24 looking at the criteria for testing, and they have had
25 an opportunity to provide information, again they are

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1 going to want to know what you used and what you
2 didn't use, and why, and what the results of the tests
3 were, and what does that mean in terms of
4 transportation.

5 And how will that piece tie to the broader
6 piece of transportation planning, and interaction with
7 DOT, and rail transporters. So this is just the
8 beginning of a lot of discussion, and the sharing of
9 information, and that needs to happen in Utah all the
10 way along that transportation corridor.

11 FACILITATOR CAMERON: Great. Thanks,
12 Diane, and Kalynda has a comment on the location of
13 the test facility, and then we are going to go to
14 slapdown.

15 MS. TILGES: Okay. Kalynda Tilges. And
16 let me say up front that that I am certainly concerned
17 about business being brought into Nevada and making
18 jobs for people, and making sure that we are involved
19 in as much of this process as possible.

20 And I am not Western Shoshone, and I
21 cannot speak for the Western Shoshone, but the
22 Shundahai Network does stand up and fight for
23 environmental justice, and indigenous rights.

24 And after saying that, I would be remiss
25 in reminding everyone what John Wells said today, that

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1 the Nevada Test Site does not belong to the NRC or the
2 DOE. It is Western Shoshone, and it belongs to them
3 by the Ruby Valley Treaty of 1863.

4 And I don't believe that we can be
5 discussing whether or not to put something there, but
6 I believe with the four meetings planned are not
7 nearly enough there need to be more meetings just in
8 the very beginning phases, and all the way through,
9 and I hope that these continue all along the
10 transportation route.

11 And I will say again and echo Diane
12 Nielson's comments that these absolutely have to be
13 held in Salt Lake City and Tuella (phonetic), and I
14 would like to see more than one in each, and I would
15 like to see the process continue to completion. Thank
16 you.

17 FACILITATOR CAMERON: Thank you, Kalynda.
18 Fred.

19 MR. DILGER: This is a process
20 announcement, or a comment, and Rob Lewis mentioned to
21 me that the paper, the counter-proposal that Bob and
22 I have prepared is available, or that we did not bring
23 enough copies for everyone, and it is available on the
24 State of Nevada website.

25 I am not going to read the website address

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1 to you out of mercy and out of humanity's sake. But
2 I will ask Chip to write it up on the process board.

3 FACILITATOR CAMERON: Okay. I am going to
4 put this up and thank you, Fred. And how about the
5 issue of slap down. Now, we heard a little bit about
6 that in Rockville at the last meeting, I believe.
7 Andy, can you just tell us a little bit about what is
8 the slapdown issue test?

9 DR. MURPHY: To answer your question, we
10 did very specifically talk about the slapdown as one
11 of the potential orientations, and I can tell you that
12 we decided not to include it in the proposal. Can I
13 tell you at the exact reasons at the moment? I don't
14 remember.

15 But as we go through the process at this
16 stage, we will put it back on the menu as something to
17 take a look at.

18 MS. JOHNSON: And I have to tell you that
19 I didn't know that was the word for it, but when
20 Kalynda was speaking about the full-scale testing as
21 far as the speed of a runaway truck, or a runaway
22 train, it was something that I had written down
23 previously because I lived in the State of Washington,
24 as opposed to what the terrain is here in the State of
25 Nevada.

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1 And we have very high mountains in the
2 State of Washington, and I was going through
3 (inaudible) Pass one evening, and a truck lost its
4 brakes, and went over the side of the mountain, and I
5 would think that would be that slap down test maybe,
6 when it starts hitting, and I think that is a really
7 important thing.

8 And I think that we are luckily not a flat
9 country, and from what I understand, a lot of these
10 proposed routes are across very steep hills. And I
11 would imagine that you would not let somebody get out
12 there on the road in a storm or in a proposed storm,
13 but brakes do fail.

14 And I think that those are some of the
15 things that we really need to take into consideration.

16 FACILITATOR CAMERON: Thank you very much,
17 Peggy. Mike.

18 MR. BAUGHMAN: A quick question. Maybe I
19 missed this earlier in the day, but I did note in here
20 that we are talking about a 6 year test plan, and it
21 says here that the casks in the PPS represent a 6 year
22 work plan. That is on page one, in the introduction.

23 Is that from here forward? Can you give
24 us a general sense of timing on this? When might the
25 results be available?

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1 FACILITATOR CAMERON: That is one of the
2 issues that we have up here in the parking lot and so
3 that's great. Can we get an answer to that?

4 MR. BAUGHMAN: Let me just note that my
5 interest in the answer is 6 years from today is
6 roughly 2009, which is getting very close to DOE's
7 current schedule for the first shipments.

8 And if they do it for cooling purposes or
9 whatever out there, that may be after the first
10 shipment. So if this is going to inform in any way or
11 cask testing or cask certification, it strikes me that
12 6 years may be too long. So I was just curious about
13 that.

14 DR. MURPHY: Let me give you a little bit
15 of a time line. We are finishing our public comments
16 on the 1st of June, and we are going to take several
17 months to analyze those and to begin to make
18 recommendations and proposals to our management as to
19 what to do about them.

20 I was talking to one of the reporters
21 during the humanity break, and he was told the time
22 line that we would be hoping to have some kind of a
23 draft, and maybe just for internal consumption, by the
24 end of this calendar year.

25 And depending upon exactly how things go

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1 forward, the important driving points at this stage
2 are the acquisition of the casks, which will be
3 acquired according to the Federal Procurement
4 Regulations to answer Bob's question on that.

5 And in talking with the two cask vendors
6 that we have used in the test protocol, Holtec
7 indicated that their current scheduling would be
8 approximately 18 months from the time an order arrived
9 at their door to delivery.

10 General Atomic indicated about 2 years or
11 24 months. Now, we need to take all of these times
12 with a little bit of salt, because they may be able to
13 do procurements faster than they had indicated, and do
14 construction or fabrication faster, or it may take
15 longer because of special materials that they need.

16 But those are good working numbers, so
17 that we are talking about having testing in '04 and
18 '05, so that the 6 years is more from '99 into '05,
19 rather than from 6 years from today until we have the
20 test results available.

21 FACILITATOR CAMERON: Okay. Thank you,
22 Andy. Diane.

23 MS. NIELSON: I guess at this point that
24 I have to say that if the licensing board decision
25 stands, that time frame may be just fine. If the

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1 licensing board decision does not stand, and Private
2 Fuel Storage goes forward with their proposal in Skull
3 Valley, at this point they are anticipating completion
4 of construction sometime in 2004.

5 It is entirely conceivable, because the
6 NRC isn't regulating or making a decision on
7 transportation to Skull Valley, that all of the work
8 that you are talking about right now, all of the
9 testing, all of the planning, all of the preparation
10 for the public, will in fact be occurring with used
11 casks, because Private Fuel Storage will already
12 independently, and without any authority from DOE, or
13 the NRC, beyond what you have right now -- and
14 certainly without the completion of the information on
15 this testing protocol -- be shipping spent nuclear
16 fuel across the United States on one of the transport
17 routes that the EIS for Yucca Mountain decides in to
18 Utah, and into Skull Valley. And that is an
19 unacceptable scenario.

20 FACILITATOR CAMERON: Two points there.
21 One is that that sort of reemphasizes your point from
22 this morning that used casks -- well, perhaps not. We
23 are not going to have this test done in time for --

24 MS. NIELSON: Well, I guess the kind of
25 used cask is that you ought to uphold the decision by

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1 the licensing board, but the point of my comment is
2 that this schedule, if it is going to be useful for us
3 in the context of Skull Valley, has to be faster than
4 that.

5 And for all of the reasons that you would
6 do this if you were shipping to Yucca Mountain, you
7 need to be doing it if you are shipping to Skull
8 Valley, and if you are not prepared to do so, then you
9 need to be prepared to put a halt to transportation to
10 Skull Valley until this work is done.

11 Because the very same shipping routes, and
12 the very same alternatives, with significantly less
13 testing protection and management of the shipments,
14 and everything else that goes along with that, will be
15 absent.

16 FACILITATOR CAMERON: Bill, can I check in
17 with the audience first, and then I would like you to
18 close the meeting out for us, too, and so maybe you
19 can -- well, do you want to make a quick point on
20 that? Go ahead.

21 MR. BRACH: Let me make just a very quick
22 comment. I mentioned early this morning when we first
23 started, and I realize that has been a few hours ago
24 now. But our planning for the package performance
25 study is not tied specifically either to the

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1 consideration of Yucca Mountain as a national
2 repository, or to the licensing of the Private Fuel
3 Storage facility, or any other spent fuel storage
4 facilities, or planned spent fuel transport.

5 And realizing that much of the discussion
6 during the day has been with regard to the timing of
7 the study, and the potential for Yucca Mountain if it
8 were to become licensed to become or to start
9 receiving fuel, and in those time frames involved, and
10 the same for Private Fuel Storage.

11 But the study is not planned or envisioned
12 or from our perspective a necessary element to support
13 the licensing or potential licensing of either of
14 those facilities or other storage facilities.

15 Now, a little more coincidental, in that
16 the timing -- and, Andy, just to summarize, in the
17 2005 time frame, assuming that all stays on track and
18 the scheduling and testing occurs in that time frame,
19 it would be commensurate well before the scheduled
20 time for the Yucca Mountain facility, if that were to
21 become licensed, and also the PFS facility.

22 And, Diane, you had just summarized the
23 time frames, and depending on the future outcomes of
24 board decisions and actions, but I wanted to stress
25 that this study and the conduct of the study is not

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1 tied to any of those licensing considerations.

2 I do recognize the points that you have
3 made with regard to the purpose of our meeting today,
4 and following meetings, is in outreach activities, and
5 listening, and hopefully gaining understandings by a
6 broad cross-section of stakeholders on what we are
7 doing, and why we are doing it, and the information
8 and results that we generate, how that would be used
9 in our licensing and regulatory activities.

10 But it is not specifically tied to the PFS
11 or to the Yucca Mountain licensing activities.

12 FACILITATOR CAMERON: Go ahead, Diane.

13 MS. NIELSON: Could I respond? I always
14 hesitate to say that this is the most important
15 message, but I guess based on what you just said that
16 this is the most important message.

17 Interstate transportation of spent nuclear
18 fuel to any temporary or permanent storage facility in
19 the west that is going to travel through the State of
20 Utah should not be conducted until after this testing
21 protocol is completed, and the testing has been done,
22 and the results of the testing have been included in
23 the transportation requirements and cask requirements,
24 and the other procedures that are dependent upon these
25 cask testing protocols have been fully accomplished.

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1 It goes beyond trust with citizens, and it
2 is a safety issue. The reason that we are having this
3 discussion is a safety issue. The reason that we are
4 having it I think is because at some point soon based
5 on current plans, we are going to be transporting all
6 of the Nation's spent nuclear fuel on one of these two
7 transportation scenarios, by rail or by truck.

8 And I think that this is absolutely
9 critical information, and I think that the public
10 expects it, and I am encouraged that we are having
11 this discussion, but I can't imagine having it after
12 transportation begins, and after you have already
13 certified the casks.

14 MR. BRACH: I understand your comment, but
15 as I mentioned before, from the NRC's perspective, and
16 as I mentioned earlier in the discussion this morning,
17 that we are confident with regard to existing
18 regulations and practices currently in place for the
19 transport of spent fuel, but I understand your comment
20 and respect the views that you offer. Thank you.

21 FACILITATOR CAMERON: And I don't think it
22 can be underemphasized based on what Diane is saying.
23 Let me see if there is anybody in the audience that
24 wants to ask a question or make a comment at this
25 point. And we will come back up. Anybody?

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1 MS. TILGES: Chip, I actually have
2 something to present on behalf of the public if there
3 is no questions from the public.

4 FACILITATOR CAMERON: Let me just check
5 and see. Anybody? Okay. Before we do that, let's
6 hear from Bob on this last issue.

7 MR. HALSTEAD: I want to briefly add to
8 what Diane has said. Certainly Utah and Nevada would
9 love to be relieved of the potential burden of
10 receiving all of this spent fuel, and in the case of
11 Nevada, high level nuclear waste.

12 And perhaps that will come to pass, but
13 right now for your planning purposes, I don't think
14 the kind of project that you are proposing would be
15 proposed at this point in time, nor would it be
16 supported I think by the people who have to support it
17 and I am thinking of the people in Congress, if we
18 weren't facing this.

19 And I am not sure how you thought through
20 all the appropriations issues, but as I understand it,
21 these are not insignificant costs and will probably be
22 paid for from the Waste Fund. So in that way there is
23 a link here.

24 And I am actually a little caught off-
25 guard and speechless at the end of the night. I don't

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1 disagree or rather I may disagree, but I am a little
2 caught off-guard by the way you phrased this, Bill,
3 because my understanding was that the entire rationale
4 for this program was the pending dramatic increase in
5 the number of shipments, and that is what raised the
6 public concern.

7 And while we have told you that we think
8 that you should focus on public safety rather than
9 public confidence, I think if you didn't feel that you
10 were facing some crisis, or at least some opportunity
11 to address that public confidence issue, you would be
12 doing this.

13 So I preserve the right to bring this up
14 again at the next meeting as a kind of closure thing
15 at our Chicago meeting. But I think your points are
16 very well taken, Diane, that in the event that you --
17 that in the event that the Skull Valley PFS license
18 does go forward, and it is on a faster track than this
19 program, I think that you need to think about that
20 right now from the schedule standpoint.

21 Now, on the other hand, given DOE's
22 schedule, you probably have some time.

23 FACILITATOR CAMERON: All right. Judy,
24 and then we will go to Kalynda. Go ahead, Judy.

25 MS. TREICHEL: I think we are a little

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1 backwards here. I don't think that you need to hurry
2 these tests. That has been the problem all along, is
3 that everybody has got to jump in there and serve the
4 nuke guys. I don't think so.

5 You have got a lot to put together, and if
6 you do it well, it is going to have to be well planned
7 out, and done in a good way, and the hell with these
8 people.

9 This is crazy. The thing that is too soon
10 is a potential Skull Valley temporary site, and a
11 potential Yucca Mountain repository. They might have
12 to wait until you can do it right, or they might have
13 to wait altogether.

14 But you don't do this stuff until you are
15 ready, and you don't get sped up. If your test isn't
16 done, and somebody says they are ready to go, you are
17 going to somehow or another muster the courage to say,
18 well, no, I'm sorry, we really have important things
19 to do and we can't guarantee to these people what they
20 need to be guaranteed. So we are accommodating the
21 wrong servant here.

22 FACILITATOR CAMERON: Okay. Well, that is
23 a very useful discussion on that particular point.
24 Kalynda, did you want to -- are you going to show us
25 a movie at this stage of the game? I don't think we

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1 can do that.

2 MS. TILGES: It is just a short little
3 film called "Duck and Cover." No, anyway, as I stated
4 -- Kalynda Tilges. As I said earlier on that I was
5 very concerned about the public participation in this,
6 first of all, the invitation that the public would
7 have a certain period for comment, and the agenda
8 being changed without notice.

9 But before that, even seeing the notice,
10 there were quite a few groups who were very concerned
11 with the fact that this was supposed to be an open
12 public workshop for the benefit of the public.

13 But was put together during the middle of
14 the day and in the middle of a week day, and when most
15 of the public is working or at school. So to me that
16 is not a public workshop. That actually dissuades the
17 public and it discourages public involvement and
18 public empowerment.

19 So what we decided to do -- Public
20 Citizen, Shundahai Network, and Nevada Nuclear Waste
21 Task Force -- was to hold our own workshop. Bob
22 Halstead was a presenter and we did a presentation,
23 and we did a workshop specifically for the public last
24 night.

25 And we took public comments, because not

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1 everyone could make it here today, and not very many
2 people could make it here today at all. So I would
3 like to submit for the record the videotape that we
4 took of the entire proceedings, and all the public
5 comments.

6 And along with that, I would also like to
7 submit in their entirety my sheets on the WIPP
8 experience and, "Too Little, Too Late," our talking
9 points, and Shundahai will be submitting a more
10 detailed, written comment later.

11 But at least you do have a little bit more
12 public involvement here, and I am hoping -- and quite
13 frankly, I am tired of doing your all's job. You have
14 got quite a large staff at your disposal, and you have
15 millions more dollars than a grass roots group can do,
16 and if you can't do any better, then maybe you need to
17 hire someone who is used to working with a little less
18 money, and a lot more consideration of the public. So
19 whoever would like to take these.

20 FACILITATOR CAMERON: Well, we appreciate
21 the fact that you are providing that information for
22 us, and thank you. And Diane, did you have something
23 else, or did you have --

24 MS. NIELSON: No.

25 FACILITATOR CAMERON: All right. I guess

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1 I would just like to thank all of you. You were
2 really a wonderful group, and thank you for your
3 patience, and your comments, and fortitude, and with
4 that, I am going to turn it over to Bill Brach for
5 some final words, and then we will adjourn.

6 MR. BRACH: I will be very brief. I am
7 sitting here looking at a clock that says 7:35 p.m.
8 and that is local time, and I can speak for myself and
9 a number of people at the table, and in the audience,
10 that maybe their body is still on Eastern Time. So
11 you can add 3 hours to that.

12 So it has been a long day, but I would
13 like to go back to the opening comments that I had
14 this morning as far as what did I see to be a measure
15 of our goal if you will for the success of the
16 meeting.

17 And what I tried to lay out this morning
18 was a goal that I have, and which I think we all had
19 for the meeting, was to have an open dialogue, respect
20 for differing views, and I believe that we have had
21 that on a number of topics, whether it be on the
22 impact, the fire, overarching issues.

23 I think we have heard a wide spectrum of
24 comments and suggestions to us and to the NRC for us
25 to consider in the package performance study. That

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1 was the purpose of our being here, and I very much
2 appreciate everyone's active participation and their
3 comments.

4 As Chip mentioned this morning, the entire
5 proceedings are being recorded, and I have taken a
6 number of notes and I know that other staff here as
7 well have for our consideration, and I thank you very
8 much.

9 One comment and observation, and we can
10 all pat ourselves on the back for this. Last week we
11 had our first meeting in Rockville. We ended around
12 6:00 p.m., or somewhere thereabouts, and I had a
13 similar seat looking towards the audience.

14 And I probably could count on one hand at
15 that point in time around 6:00 p.m. the number of
16 people that had stayed in the audience. I want to
17 thank all the folks that have preserved, and it is
18 7:37 now, and so I told you that I would be brief, but
19 I thank all of you for your perseverance and your
20 active participation.

21 And as Andy has said, and Amy as well, we
22 will be through the end of May, looking for and asking
23 for your input and comments, and then over the
24 following months doing our best to be sure we can
25 understand and pull together from those comments and

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1 suggestions that we have received recommendations on
2 how to proceed forward.

3 And Amy, too, has mentioned an important
4 part, and it is on our part on how we are going to be
5 providing feedback to you on following today's meeting
6 and the other meetings, and the comment period.

7 The feedback to you as far as what we are
8 doing, and the comments that we have heard, and how we
9 understood those, and how we are proceeding, and for
10 those comments -- and I believe Peggy specifically had
11 asked this, for those comments not accepted, the kind
12 of why not.

13 We need to walk through the process we are
14 going to use to be sure we can provide that feedback
15 and hopefully build the public trust that we have been
16 talking about today.

17 So I want to again thank you very much.
18 It is now 7:38 and I promised to be brief, and I thank
19 you all very much. Thank you.

20 (Whereupon, the meeting was concluded at
21 7:38 p.m.)
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