

1 UNITED STATES OF AMERICA

2 NUCLEAR REGULATORY COMMISSION

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4 MEETING WITH THE ADVISORY COMMITTEE ON

5 NUCLEAR WASTE (ACNW)

6

7 WEDNESDAY, DECEMBER 18, 2002

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9 ROCKVILLE, MARYLAND

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11 The Commission met in the Commissioners'

12 Conference Room, Nuclear Regulatory Commission, 11555

13 Rockville Pike, Rockville, Maryland, at 9:30 a.m.,

14 Richard Meserve, Chairman, presiding.

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1 COMMISSION MEMBERS PRESENT: 2

2 RICHARD A. MESERVE, Chairman of the  
3 Commission

4 NILS J. DIAZ, Member of the Commission

5 EDWARD McGAFFIGAN, JR., Member of the  
6 Commission

7 JEFFREY S. MERRIFIELD, Member of the  
8 Commission

9 (This transcript was produced from  
10 electronic caption media and audio and video media  
11 provided by the Nuclear Regulatory Commission.)

12 ALSO PRESENT:

13 GEORGE M. HORNBERGER, ACNW Chairman

14 B. JOHN GARRICK, ACNW Member

15 MILTON LEVENSON, ACNW Member

16 RAYMOND G. WYMER, ACNW Vic-Chairman

17 STEPHEN G. BURNS, Deputy General Counsel

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2 9:30 a.m.

3 CHAIRMAN MESERVE: Thank you, Madam  
4 Secretary.

5 Commissioner Dicus has asked me to express  
6 her regrets, that something came up this morning and  
7 so she's unable to attend this morning's meeting.

8 We are here this morning to hear from the  
9 Advisory Committee on Nuclear Waste on the status of  
10 the committee's activities over the course of the  
11 last several months. I believe we last met with the  
12 group in March of this year. I know from the  
13 correspondence we've received that you have been very  
14 active and including a lot of activity related to the  
15 commission's focus on Yucca Mountain, and I believe  
16 our presentations this morning will be focusing on  
17 that matter. And so we very much appreciate hearing  
18 from you.

19 With that, why don't we get underway.  
20 Dr. Hornberger?

21 DR. HORNBERGER: Thank you, Chairman  
22 Meserve.

1           As you indicated, my -- I will just briefly 5  
2 go through an introductory, a few slides here  
3 pointing out the things that we have done and a few  
4 of the things that you will be hearing about today.

5           If we go to the second slide, some of the  
6 recent activities of the ACNW, we looked at the 10  
7 CFR Part 63 Amendments and we looked at the Yucca  
8 Mountain Review Plan. And, in fact, I will do a  
9 brief presentation on the results of our look at the  
10 YMRP and the staff's response.

11           We investigated the key technical issue  
12 resolution process that the staff is engaged in and  
13 we also had a look at waste-related research, both in  
14 the office of research and in NMSS as it relates to  
15 their work primarily through the Center for Nuclear  
16 Waste Regulatory Analysis.

17           We did in September have a meeting in  
18 Nevada. That's -- typically we have a meeting in  
19 Nevada in the autumn. And we held a public meeting  
20 at Parump and heard presentations or heard about  
21 concerns of members of the public in Nevada.

22           On slide three, we also in October traveled

1 to Europe. We attended the Quadripartite meeting in 6  
2 Europe. This was the first time that the  
3 Quadripartite meeting had a session on the last day  
4 on waste-related issues. And, in fact, we met with  
5 members of the advisory groups and regulators in the  
6 other countries to discuss some issues of common  
7 interest.

8 We also made a trip to Sweden. We visited  
9 some of the Swedish waste management facilities.  
10 And, in fact, as I think anyone who visits these  
11 facilities in Sweden were very impressed with the  
12 efficient and immaculate storage facilities they  
13 have.

14 We also observed that in Sweden, and as I  
15 mentioned to Commissioner Dicus when we met with her  
16 the last time we were here, probably because Sweden  
17 is more uniform and certainly a smaller country,  
18 but they seem to have an agenda to which everyone  
19 agrees. That is, they don't agree on necessarily the  
20 details, but everyone agrees that there is a problem  
21 and that the waste problem should be solved and that  
22 it really should be through geological disposal,

1 which is impressive that they have that uniformity of 7  
2 opinion.

3         Slide number four, we have looked at issues  
4 dealing with spent fuel transportation. And, in  
5 fact, we held a workshop last month on issues about  
6 -- related to spent fuel transportation. I got a  
7 letter from Mr. Robert Loux from Nevada. Mr. Loux  
8 was -- had some concerns that we had missed certain  
9 things in our meeting. We have corresponded with  
10 Mr. Loux and invited Nevada to present technical  
11 information to us in the future and, of course,  
12 pointed out that this is just a -- it's an ongoing  
13 issue and we recognize that the ACNW will continue to  
14 look at the issue and to advise the commission as  
15 appropriate when we see fit. We will have a report  
16 later on spent fuel transportation.

17         We also looked at the issue of orphan  
18 sources and the whole notion of how one might track  
19 and keep track of some of these sources that are out  
20 there.

21         So, slide 5, today's topics, we will talk  
22 about the staff's high-level waste risk insight

1 initiatives. We'll talk about the Yucca Mountain 8  
2 review plan, spent fuel transportation, igneous  
3 activity and have an update on the container life and  
4 source term KTI. And so our first presentation, I  
5 don't think that it's appropriate to have questions  
6 after this just introductory remarks, but we'll  
7 proceed right to our first presentation and John  
8 Garrick will discuss the high-level waste risk  
9 insights initiative.

10 John?

11 DR. GARRICK: Thank you, George.

12 Slide 6, the committee first heard about a  
13 high-level waste risk insight initiative earlier this  
14 year and we received a briefing in April on an  
15 exercise that was performed by the staff to -- for  
16 the purpose of developing the initiative and wrote a  
17 letter responding to that exercise in July and  
18 received the EDO response in August. The committee  
19 has always been eager to see the staff move forward  
20 proactively with respect to using risk concepts to  
21 inform the analyses that are performed and assist the  
22 whole process of assigning priorities, et cetera.



1           It's interesting, but when you start           9  
2 talking about risk insights and risk insights  
3 initiatives to ask the question, well, what do we  
4 mean by risk insights? And of course it's also  
5 important to look around and see what documentation  
6 exists within the agency that might answer that  
7 question, and of course there is a document. The  
8 document that is very explicit about what is meant by  
9 risk insights is the Commission White Paper that was  
10 published in, I believe, March of 1999. A White  
11 Paper that was for the purpose of adding some  
12 clarification on the meaning of some of the terms  
13 that had become frequently used in this transition to  
14 a more risk informed regulatory process.

15           And the comment there was that what we mean  
16 by risk insights is in reference to results and  
17 findings that come from risk assessments on slide 7.

18           Now, that White Paper, I thought was  
19 extremely valuable in this whole exercise of trying  
20 to figure out the best way to utilize the risk  
21 informed performance-based way of thinking. Because  
22 it not only addressed the question of risk insights,

1 it addressed the question of what do we mean by risk, 10  
2 what do we mean by risk assessment, what do we mean  
3 by performance-based and defense in-depth.

4 The distinction between being risk informed  
5 and the risk-based concept, all those concepts were  
6 very well articulated and have proven to be very  
7 valuable to those of us who have been in a role of  
8 trying to offer advice on how to implement.

9 Now, as far as in slide 8, we talk about  
10 what are risk insights, but here we are really  
11 talking about what's the risk insights initiative.  
12 And the staff had indicated that the initiative is  
13 based on information that comes from the DOE safety  
14 case, that is obviously linked to the Part 63  
15 Requirements and is based on performance assessments.  
16 So there is a little difference there because they  
17 are talking about risk insight initiative rather  
18 than just risk insights.

19 Now, why would you want to have a risk  
20 initiative, a risk insight initiative? The reasons  
21 that were given by the staff are on slide 9 and this  
22 is a direct replication of the staff's comment on

1 that question and it is to document -- to provide 11  
2 documentation of the risk insights and make some --  
3 make the connection to the resolution of the  
4 agreements, the agreements that have come out of the  
5 issue resolution process with the Department of  
6 Energy in relation to the key technical issues.

7 As you know, there is some 300 agreements,  
8 292 or some number approximating that that resulted  
9 from those -- from the technical exchanges between  
10 the NRC and the DOE. And, for example, there is some  
11 58 agreements associated with one key technical  
12 issue, namely, the container life and source term,  
13 and we'll be hearing more about that later from Ray  
14 Wymer.

15 The idea here is to have an initiative that  
16 assists the process of deciding which of these  
17 agreements ought to receive the greatest amount of  
18 attention and how to allocate resources.

19 The reasons for the risk initiative that  
20 were given by the staff besides documenting results  
21 were to carry forward the concept that has its roots  
22 in the probabilistic risk assessment policy

1 statement, that is, to reduce regulatory burden, to 12  
2 improve communication and integration, to implement  
3 risk insights into issue -- into the resolution  
4 process.

5       The committee was very impressed with what  
6 they were able to do in the communication and  
7 integration goal. It's clear that the exercise that  
8 they went through of trying to do some degree of  
9 importance ranking of the agreements that fall out of  
10 the issue resolution of the key technical issue, it's  
11 clear that the communication part of that exercise  
12 was extremely successful. Extremely successful in  
13 terms of getting the key technical issue people to  
14 interact and work more closely with performance  
15 assessment people, for example.

16       The fourth bullet here given for -- the  
17 reason for having the initiative was implement risk  
18 insights into issue resolution process. While we  
19 gave them very good grades on the third bullet of  
20 improving communication and average grades on the  
21 first two having to do with documentation and  
22 reducing regulatory burden, we didn't give them such

1 good grades on the fourth bullet, namely, of 13  
2 implementing risk insights into issue resolution  
3 process and we'll come to reasons for that in a  
4 minute.

5 So what we pretty much observed here was  
6 that the whole process, the exercise seem to be  
7 extremely successful in terms of creating good  
8 interaction between the important groups here, but  
9 there was an absence of what we would call visible  
10 risk assessment, risk assessments and the result in  
11 keeping with the definition offered by the Commission  
12 White Paper and now I'm talking about slide 10.

13 Slide 11, continuing with our observations,  
14 it became clear to the committee that while there was  
15 a ranking that was developed as a result of this  
16 exercise, the ranking was not really on the basis of  
17 risk. The rating process that was employed lacked  
18 rigor. It was very qualitative, not quantitative.  
19 But, again, it's not to say that it wasn't a valuable  
20 exercise because it was.

21 And the other thing that's important here  
22 is that we learned from the EDO response letter that

1 the path forward here is an aggressive one with 14  
2 respect to the concerns of the committee, that they  
3 do plan to repeat the exercise, they do plan to  
4 utilize risk assessment methods for -- in a more  
5 explicit and rigorous manner to organize the  
6 agreements and so we were -- we're very encouraged  
7 with what we are reading in the response as to what  
8 the path forward is.

9         So our conclusions are really that this was  
10 very successful for internal communication and  
11 documentation. And as all of us know in work of this  
12 nature, that's probably the most important thing, is  
13 to get the important parties to interact with each  
14 other and exchange notions and ideas about what they  
15 believe to be important and have the full benefit of  
16 that information in making decisions about the scope  
17 of effort required to resolve the agreement.

18         On the other hand, we saw in this initial  
19 exercise a lack of use of risk assessment methods and  
20 therefore we consider this kind of a diminished role  
21 of risk in the process based on the first, the first  
22 effort.

1           So what do we recommend? Well, we           15  
2 recommend that they repeat the exercise and adopting  
3 the interpretation on the White Paper on the meaning  
4 of risk insights and we also recommend that there be  
5 a more visible use of the performance assessments in  
6 prioritizing the agreements. The committee has, for  
7 many months and even years, been pushing the notion  
8 of having the sub-issues to the key technical issues  
9 mapped in some sort of prioritized fashion, such that  
10 one can see the relationship between the results of  
11 the performance assessment and the results that have  
12 evolved from the activities surrounding the key  
13 technical issue resolution process.

14           Thank you.

15           CHAIRMAN MESERVE: Thank you.

16           Why don't we proceed and go through the  
17 briefings and then we'll come back and do the  
18 questions and do it all in one loop, okay?

19           DR. HORNBERGER: You want to suffer through  
20 the whole thing first, huh? Okay.

21           So I'm up next, and I'll give you a little  
22 bit of information on our review of the Yucca

1 Mountain review plan. 16

2 On slide 15, I just wanted to indicate to  
3 you some of our procedures. We actually started  
4 pretty early on in this process, well before the  
5 document was publicly available. We interacted as  
6 individuals, not as a committee, but several of us  
7 met individually with the NRC staff. We provided  
8 informal comments on some of -- to them on some of  
9 their ideas and basically worked iteratively and this  
10 process seemed to work pretty well, and as we got  
11 some early inklings, at least as individuals,  
12 although we didn't discuss it as a committee, but we  
13 had some feeling about how things were proceeding and  
14 they also got the benefit of comments from several of  
15 us as individuals.

16 On slide 16, I'll just go through a few of  
17 the comments that we made in our letter to you and  
18 also discuss -- on the same slide, you'll see the  
19 staff -- an abbreviation of the staff's response so  
20 that we know where we are.

21 I think it was at the March meeting, and if  
22 I'm not mistaken, it was Commissioner McGaffigan who



1 posed a question to us and that we should pay 17  
2 attention to when we looked at the Yucca Mountain  
3 review plan and that was why we needed a thick volume  
4 when it seemed that other regulatory guidance could  
5 be much smaller.

6 And, in fact, we -- in looking through the  
7 document, we came to the conclusion that it really is  
8 very repetitive. The staff took that approach, I  
9 think, to be complete within each individual  
10 subsection. But it does make the document pretty  
11 tiresome to read cover to cover and we suggested  
12 that --

13 COMMISSIONER McGAFFIGAN: A human being  
14 actually succeeded at doing that?

15 DR. HORNBERGER: I'm choosing my words  
16 carefully obviously.

17 And we suggested that one way that they  
18 might find a way to reduce the monotony in the  
19 document was to use tables, charts, graphics to try to  
20 improve the readability.

21 The staff responded and said that they  
22 would in fact, and when they did their revision to

1 look for opportunities to economize on the repetition 18  
2 and to reduce the length.

3 Slide 17 --

4 COMMISSIONER MERRIFIELD: Mr. Chairman, I  
5 would just say I would compliment on this initiative  
6 as it is consistent with the agency's direction on  
7 plain English, for making the documents more  
8 approachable.

9 DR. HORNBERGER: The second comment that we  
10 offered was that -- again, because not only the  
11 applicant, the Department of Energy, but there would  
12 be I think many other stakeholders interested in the  
13 Yucca Mountain review plan and the question that  
14 arises is, well, all right, how will in fact the  
15 guidance be used in a risk-informed setting? And we  
16 suggested that it might be very useful if they could  
17 have an appendix with an example about how the review  
18 plan would actually be used.

19 The staff in their response, I think,  
20 agreed with us that this would be useful, but they  
21 also recognize that they have to be very careful  
22 obviously in producing such an example and they have

1 to consider whether they even could do it because of 19  
2 the -- they couldn't give an impression that there  
3 had been any decision reached.

4 Our third comment on page 18, the Yucca  
5 Mountain review plan had suggested that a lot of the  
6 effort in the review, the depth of the review would  
7 be concentrated on the Department of Energy's  
8 principal factors that they would come forward with  
9 in any license application, which I think makes  
10 sense. But we also then recommended to the staff  
11 that they not confine the depth of their review or  
12 the decisions on the depth of the review, just to the  
13 Department's presentation and that they should use  
14 their own risk insights to determine depth of review  
15 in certain aspects. And the staff's response was  
16 that in fact they did fully intend to build on their  
17 own risk insights.

18 On slide 19, our fourth comment, we noted  
19 in certain parts of the YMRP -- the Yucca Mountain  
20 Review Plan that there appeared to be carry-over from  
21 guidance that was pertinent for reactors and we  
22 questioned whether this was appropriate, that there

1 may be inappropriate guidance in there that was in a 20  
2 carry-over from reactor and we questioned whether  
3 there would be relevance to a waste disposal issue.  
4 The staff again responded that they will go back and  
5 they would ensure that they would -- that the review  
6 areas are appropriate for high-level waste.

7       On slide 20, future actions, I will say  
8 that we were -- that the ACNW was very pleased with  
9 our interactions with the staff on this. Jeff  
10 Ciocco, the team lead, was extraordinarily helpful  
11 in our interactions as well as Bill Reamer and all of  
12 the other people. I shouldn't single out anyone.  
13 The team was very good. So we don't have any plan to  
14 re-review the next release of the Yucca Mountain  
15 review plan unless the commission, of course, asks  
16 that we do so.

17       We do intend to watch as the key technical  
18 issues are integrated into the sub-issues that are  
19 part of the basis for the Yucca Mountain review plan  
20 and, of course, we will review the integrated issue  
21 resolution status report.

22       Slide 21, our approach has been and we

1 intend that it would continue to be that we would 21  
2 focus on selected key technical issues. For example,  
3 we think that the total system performance assessment  
4 is very critical as we move forward, as is the  
5 container life and source term issues, so we would  
6 continue to focus on things that we thought are most  
7 important.

8 In the spirit of moving right through, the  
9 next topic is spent fuel transportation and Milt  
10 Levenson will handle that topic.

11 MR. LEVENSON: Good morning. Spent fuel  
12 transportation is an issue of public concern  
13 encompassing both technical and nontechnical matters.  
14 While it's very complex, the primary responsibility  
15 of NRC is somewhat limited primarily to licensing the  
16 transportation cask.

17 To review the status of this  
18 responsibility, the ACNW held a one-and-a-half day  
19 workshop on cask design and testing and on experience  
20 and the shipping of spent fuel. Workshop did not  
21 address any socioeconomic or other nontechnical  
22 issues. A letter to the commission summarizing the

1 workshop is being prepared and the workshop 22

2 proceedings will be issued as a NUREG.

3 Slide 23, we define the objectives of the  
4 workshop which were to examine the technical aspects  
5 of spent fuel transportation package design analysis  
6 and testing to determine if sufficient evidence exists  
7 to substantiate that spent fuel can be transported  
8 safely or is additional evidence or information  
9 required; to examine spent fuel and high-level waste  
10 transportation safety experience in the U.S. and  
11 worldwide as we could obtain it.

12 What was omitted from the experience-base  
13 was -- and it's a very large part of the shipment  
14 question, is the shipment of nuclear weapons which  
15 goes on quite often all around the country, that was  
16 not included.

17 The invited participants included people  
18 from the Association of American Railroads, COGEMA  
19 for foreign plans, utility for private shipment,  
20 various national labs, cask vendors, industry groups,  
21 representatives with Nuclear Regulatory Commission.  
22 Department of Energy had three participants, one to

1 cover WIPP experience, the imports of foreign fuel 23  
2 from research reactors and one on navy fuel. And  
3 from the Department of Transportation there were two  
4 participants, one covering their experience on rail  
5 shipments of spent fuel and one covering truck  
6 shipments.

7 On slide 24 is the highlights from the  
8 workshop which are there have been no in-service  
9 failures and no public health and safety consequences  
10 and the database as reported by the people at the  
11 meeting, the participants, the Department of  
12 Transportation numbers are 1.6 million miles, total  
13 of eight accidents, no release of contents in any  
14 case. Four of those accidents involved empty  
15 shipping containers.

16 There's over 40 years of experience  
17 shipping spent navy fuel around the country with no  
18 releases. International experience is 30 years of  
19 shipments, over millions of miles by truck rail and  
20 ship with no release of radioactive contents; that  
21 the Sandia demonstration test in 1977 and the British  
22 operation called Smash Hit performed in 1984 were

1 full-scale tests.

24

2           The workshop indicated that advantage  
3 should be taken of currently available enhanced  
4 analytical capabilities. I think most of us were  
5 somewhat surprised at the advanced simulation  
6 capability that's been developed as part of the  
7 weapons simulation. And people from Livermore  
8 presented application of that advance technology to  
9 some other major things like dam failures and so  
10 forth. It was very impressive and indicates some  
11 very advanced capability available.

12           There were assessments of some current news  
13 items such as the Baltimore tunnel fire. The  
14 workshop presenters were in almost complete agreement  
15 that multiple-scale bottle tests provide  
16 significantly more information than a single-scale  
17 test. And the Department of Transportation  
18 representatives pointed out that while Yucca Mountain  
19 would lead to a significant increase in the shipments  
20 of spent fuel, that even at the maximum proposed  
21 rates, it represented an insignificant fraction of  
22 the total shipments that DOT classifies as hazardous.



1           For slide 24, this is a slightly separate 25  
2 subject from the workshop. The ACNW had reviewed the  
3 proposed test protocols for shipping casks and there  
4 is a letter to the commission back in June. We  
5 recommended realistic tests to validate models and  
6 increase public confidence. The testing cask to  
7 failure when tests conditions significantly exceed  
8 accident conditions, provides little benefit and  
9 assessing risk associated with such shipments. And  
10 the ACNW recommendations we believe were  
11 substantiated during the workshop.

12           Testing to validate codes should be  
13 performed not because we think there is any need for  
14 the present cask, but primarily to prepare for new or  
15 unique cask designs so that we need to be prepared  
16 for that. But the proposed program is not  
17 necessarily the most cost effective way to do so.

18           To increase public confidence, a  
19 demonstration similar to the Sandia test performed in  
20 1977 might be useful in lieu of a cask drop onto an  
21 unyielding surface. These comments I have just made  
22 are relevant to the draft protocols we reviewed.

1           We know that the protocols are new being 26  
2 revised and will be sent out for public comment,  
3 after which we will review them again.

4           DR. HORNBERGER: Thank you, Milt.

5           Our next topic is again another item that  
6 has commanded some attention relative to Yucca  
7 Mountain and I wanted to give you an update on some  
8 of the information, the latest information that we  
9 have accumulated having to do with igneous activity,  
10 the potential for igneous activity at Yucca Mountain.

11           On slide 27, the first bullet indicates  
12 that igneous activity is certainly a low probability  
13 and I would like to insert the word "potentially"  
14 high-consequence event, that some of the issues  
15 related to the discussions, current discussions at  
16 Yucca Mountain have to do with exactly what the  
17 consequences might be.

18           I should point out that the ACNW has always  
19 -- we have been consistent in suggesting that it's  
20 not really appropriate to separate the probability  
21 and the consequences because one can have some  
22 misleading interpretations. We obviously have -- we

1 separate them in the sense that they are different 27  
2 things, but the risk we know is really a convolution  
3 of the two and a potential of a very high-consequence  
4 event; like a boleite impact on the earth. We  
5 recognize that we shouldn't really assess potential  
6 mitigation strategies without considering the low  
7 probability.

8 But for this presentation, I will discuss  
9 some things having to do with the probability of  
10 disruption and also the second part of the  
11 consequence analysis and that is how Magma might  
12 interact with canisters in a drift.

13 Slide 28, the Department of Energy in 1995  
14 had an expert elicitation that for the most part  
15 followed the guidance provided by the Nuclear  
16 Regulatory Commission. They actually did it before  
17 the NUREG was issued, but they were almost totally  
18 consistent with the NUREG.

19 They issued in 1996 their probabilistic  
20 volcanic hazards analysis and approximately the  
21 expert -- the said probabilities of an intersection  
22 of a dike with a drift between ten to the minus ninth

1 and ten to the minus seventh per year. 28

2 The U.S. geological survey did a  
3 geophysical survey in the late 1990s and those data  
4 became available -- I guess actually it was in 2000.  
5 I don't have the exact date. And this was an  
6 aeromagnetic study and so the aeromagnetic study  
7 produces anomalies. These anomalies are interpreted  
8 by geophysicists as being potential centers of  
9 volcanic activities. There is room for  
10 interpretation in these data. Certainly the new  
11 aeromagnetic survey had previously undetected  
12 anomalies. As I said, there are -- there is room for  
13 different scientific interpretations of these data.  
14 But nevertheless, there are new anomalies.

15 On slide 29, the potential effects of  
16 volcanism on the repository, as we all know, are a  
17 very complex set of physical phenomena, quite  
18 difficult to model correctly, quite difficult to find  
19 analogs in the natural environment.

20 In, I think it was the year 2000, this  
21 shock-wave theory was introduced and in fact again at  
22 our March meeting. The commission asked us what the

1 ACNW thought about the nuclear waste technical review 29  
2 board. They had consultants look at the shock-wave  
3 theory and they had made comments and we were not  
4 prepared at that time to answer the commission on  
5 that because we hadn't read the material. But we  
6 did, in fact, follow up on the commission request.

7       On slide 30, the summary, the very short  
8 summary of the National Waste Technical Review Board  
9 consultant comments, they were critical of the  
10 shock-wave model that had been produced by an  
11 NRC-sponsored study, as being -- well, I guess simply  
12 overly conservative, too highly idealized if you  
13 will.

14       On slide 31, in June of 2002, we held a  
15 working group session. We invited the Technical  
16 Review Board consultants, the experts to share with  
17 us their analysis of the shock-wave theory. We also  
18 invited two experts, independent experts to advise  
19 us, to listen to the presentations, to give us their  
20 insights as well. And the focus of the workshop --  
21 the working group was on this consequence analysis.  
22 In particular, the interaction between Magma and

1 canisters and the drift. But there were some 30

2 comments made on the probability aspects as well.

3 On slide 32, let me just say that the

4 experts, from what we heard, they did not think that

5 the probability estimates would be likely to change

6 significantly as a result of these new aeromagnetic

7 data. That was their belief.

8 Nevertheless, it's clear that everybody

9 recognizes that it's still incumbent upon the

10 Department of Energy to examine these data and

11 basically take this into consideration as to how they

12 want to -- whether they want to revise their

13 probabilistic volcanic hazards analysis or whether

14 they in fact believe that the probability estimates

15 that they have are valid.

16 On slide 33, in terms of consequences, one

17 of our experts simply did not think that the volcanic

18 system in southern Nevada would be capable of

19 producing the purported shock-wave effects. And the

20 other experts all certainly agree that the highly

21 idealized analysis that had been produced perfectly

22 cylindrical drifts with, I guess shiny in-walls so

1 that we would get reflections of soft shock waves and 31  
2 build up very high pressures. They simply didn't  
3 believe that that was a realistic analysis at all.  
4 Everybody agreed that there was a need for improved  
5 modeling of these potential consequences.

6 Page 34, we wrote a report, a letter report  
7 to the commission and this slide summarizes our  
8 observations. We believe that the range of DOE  
9 estimated probabilities are reasonable. We don't see  
10 any reason that the ten to the minus ninth, the ten  
11 to the minus seventh per year estimated probabilities  
12 are unreasonable. We agree with the experts that the  
13 shock-wave analysis that had produced in the  
14 NRC-sponsored research was really too idealized to be  
15 of direct use. We recognized that it certainly  
16 served a purpose of raising the issue to -- pointing  
17 out the need for improved consequence modeling. And  
18 we think that the key technical issue agreements  
19 provide a reasonable basis for the evaluation for the  
20 licensed application. That is, the agreements that  
21 the NRC staff has in place with the Department  
22 provide a reasonable basis for evaluation of a

1 potential license application. 32

2 And our next topic will be container life  
3 and source term, and Raymond Wymer will do that.

4 DR. WYMER: This will be a short  
5 presentation. There haven't been any new revelations  
6 that would change any of our opinions about the  
7 container life and source term issue, key technical  
8 issue. I'll remind you on number view graph number  
9 36 that the principal issues involved with the  
10 container life and with the source term are the  
11 amount and the chemistry of the water that contacts  
12 the waste packages and that chemistry isn't -- the  
13 water is not distilled water. The water is water  
14 that contains things that have leached out of the  
15 grout and the rock as it goes down through the  
16 overburden and gets into the drifts.

17 The second issue is, of course, the key  
18 issue, the corrosion of the waste package which  
19 relies heavily on a particular alloy ... corrosion  
20 resistance and the possibility of drift collapse and  
21 mechanical disruption to waste packages, breaking  
22 them open in some way.



1           And then finally, most important through 33  
2 the analysis of those finally at the site boundary is  
3 radio nuclide release rates and solubility limits.  
4 That is, the source term for radioactivity.

5           These three issues taken together suggest  
6 to some of us that the extraordinary complexity of  
7 the system with respect to container life and source  
8 term and also the importance of coupled processes  
9 because each of these -- each of these issues feeds  
10 into the next issue, that is, the quality of water,  
11 effects of corrosion, the corrosion affects the  
12 release and all these things are interactive. And so  
13 the coupled processes, as we call them, are very  
14 important.

15           Some of these issues, some of the  
16 sub-issues related to these issues will not be  
17 resolved at the time of the license application, but  
18 the -- DOE and the NRC have certainly agreed on a  
19 path forward for the resolution of these in a timely  
20 way in time for the NRC to make a finding on the  
21 suitability of the repository.

22           Slide 37 relates to how you confirm or

1 establish the performance that's indicated in these 34  
2 performance analyses in order to assure yourself that  
3 you have -- can have confidence in going ahead with  
4 the decision-making process. And in this connection,  
5 the performance of Alloy 22 is one of the critical  
6 issues, so it's a corrosion issue primarily.

7       The next view graph or slide 38 addresses  
8 something which is a little new from things you heard  
9 before and that is what is DOE expecting to do in its  
10 performance confirmation of the issues related to the  
11 container life and source term.

12       DOE is redoing their performance  
13 confirmation plan, but in conversations with them  
14 they did state that the -- they do expect to address  
15 the container life and source term issue in their  
16 performance confirmation program as it would be very  
17 important. And in particular they have included in  
18 their repository a drift, an underground drift right  
19 in the repository where they will do performance  
20 confirmation and that will almost certainly include  
21 testing of waste package materials under realistic  
22 repository conditions and they'll be able to do this

1 up until the time of repository closure. So that's 35  
2 a very important addition that they have recently made  
3 to their performance confirmation activities.

4       And finally on recommendations, in our  
5 August letter, August of this year letter on this  
6 issue, we stated that the agreements between the NRC  
7 and DOE should be prioritized based on importance of  
8 risk and the risk initiative. The risk insights  
9 initiative that John Garrick reported on is dealing  
10 with this in part and it's important that we  
11 establish the risk in a prioritized manner because  
12 the NRC will place the most emphasis and require the  
13 most supporting information for those issues which  
14 are -- which bear most on the repository performance  
15 and on the importance of the barriers, so that  
16 prioritization is important.

17       Finally, we suggested that the NRC  
18 continue to incorporate simplified models of the  
19 repository, in particular, the container life and  
20 source term area. That will accomplish a couple of  
21 things.

22       One, it will enhance the notion of risk

1 communication because you will more clearly 36  
2 understand where the risks are from a simplified  
3 model and it will also provide a common-sense check  
4 on the much more elaborate and sophisticated total  
5 system performance analysis by NRC and the total  
6 performance analysis by the NRC.

7 That's it.

8 DR. HORNBERGER: Thank you, Raymond,  
9 mercifully for you -- we now come to a brief  
10 summary.

11 Let me point out that I don't intend to go  
12 through the very last slides here, but I think that  
13 everybody does have them as an appendix. We did  
14 provide definitions of initialisms that we use and  
15 hope that people can -- have been able to track our  
16 presentation.

17 So where is the ACNW headed in the future,  
18 in the near term? We certainly intend to focus on  
19 priority issues identified in our action plan. We  
20 have in the planning stage two working groups. In the  
21 ACNW we derive great value from these working  
22 sessions that we convene to really get down into the

1 technical information that we would like to have. 37

2 But we are planning two working groups.

3 One on performance assessment, to look at both the

4 TSPA and the TPA and some of the similarities and

5 differences. And in particular, to look at some of

6 the contributing portions of each of these analyses.

7 And a second workshop we plan is to look at

8 this whole issue of performance confirmation that

9 Raymond alluded to. This has just, I think, recently

10 been an activity in the Department of Energy and I

11 think it's something that the NRC staff does need to

12 keep abreast of as we move forward because it's one

13 of the requirements, that a performance confirmation

14 plan be in place.

15 Slide 42, long-term activities, obviously

16 we hope as a committee, as an advisory committee to

17 support the commission with our independent views on

18 the potential DOE license application if a license

19 application does come in and we would hope to support

20 the commission with technical advice. And obviously

21 to undertake other review activities consistent with

22 our action plan.

1           And that concludes our presentation today. 38

2           CHAIRMAN MESERVE: I would like to thank  
3 you for a very helpful presentation. In fact, it was  
4 -- you did this so swiftly and capably that I have  
5 just very few questions.

6           Mr. Levenson, on your slide 25, you have a  
7 statement that the result of the workshop, your views  
8 are even -- your views of having a realistic testing  
9 protocol for the transportation system if anything  
10 has become even stronger.

11          I did notice that in the staff's response  
12 to the ACNW letter, they provided an analysis that  
13 attempted to justify the protocol that had originally  
14 come out -- and I understand this is all very much  
15 influx now.

16          MR. LEVENSON: Right.

17          CHAIRMAN MESERVE: But it would be helpful  
18 to understand if you are trying to tell us that -- I  
19 would like to know what your response is to the staff  
20 letter. The staff, in their response, tried to  
21 explain what they -- the probabilistic basis for the  
22 protocol that they had proposed. And if you have

1 some criticism on that, it would be useful to hear it 39  
2 because we are all going to be confronted with a  
3 revised protocol soon.

4 MR. LEVENSON: Well, I'm not sure I care to  
5 criticize since they are in the process of changing  
6 it. But I tell you the opinion as to why we were  
7 critical of it in the first place and that is that --  
8 there are really sort of two issues. One is that if  
9 you do full-scale tests, the number you can afford to  
10 do are very limited. So you have very few data  
11 points. And for some of us who are engineers and  
12 have made decisions based on experimental data, we  
13 get very nervous if there's only one point.

14 If you have a number of tests, then you get  
15 more confidence in what you are going ahead with and  
16 that you just can't get multiple full-scale tests.

17 The other things -- the other part of it  
18 that we were concerned about was if you do  
19 unrealistic tests, no matter how heavily instrumented  
20 it is and if you say at the end of the day, yes, we  
21 tested this at a hundred times what is realistic, we  
22 did the equivalent of a truck going four hundred

1 miles an hour. But from the data, we can back 40  
2 calculate what's realistic; that's true in a purely  
3 technical sense. But for public discussions, the  
4 only thing that is obvious is that the cask did fail.  
5 That fact that it failed under very unrealistic  
6 conditions is not very helpful. And in fact, does  
7 not necessarily give you good data for validating  
8 your model because you want to validate your model  
9 with data collected in the range in which you are  
10 going to use it.

11 We have all had problems with extrapolating  
12 data, interpolating data. And I, for one, feel much  
13 more comfortable when data has been acquired for real  
14 cases.

15 CHAIRMAN MESERVE: Let me express just my  
16 own view on this. I'm sure the other commissioners  
17 can also -- they have their own view.

18 We have been licensing casks for a long  
19 period of time. We have been comfortable with the  
20 kind of engineering analysis and testing that's been  
21 done and it's -- as you have discussed, it's been  
22 highly successful, that we have not had any problems



1 with the casks. But part of the concern about the 41  
2 cask is that you have never -- haven't done a  
3 full-scale one. And there are obviously concerns  
4 that some have, that they might be some lack of  
5 realism in the scaling models.

6         And since the public concern is so intense  
7 with regard to the transportation issues, I think  
8 that there was -- at least my conclusion, that we  
9 should support the kind of testing, that we were  
10 getting some public pressure quite frankly to do, to  
11 demonstrate that, well, we're very confident about  
12 our engineering, but nonetheless we are prepared to  
13 do a full-scale test to demonstrate that that  
14 confidence is fully justified.

15         On the second point about the lack of  
16 realism for the test, the staff tried in their letter  
17 to explain why they thought that their testing  
18 protocol was realistic at the probability range of  
19 which they think they are going to have to evaluate  
20 the casks and obviously it -- and I appreciate your  
21 comment that the testing should be done in the regime  
22 in which you are interested in the data as being

1 something that you have some bench mark against in 42  
2 the data to support the information that you are  
3 trying to glean from the test about what the real  
4 world performance is and I take your comment is  
5 that's the concern you have.

6 MR. LEVENSON: Yeah, well, there are really  
7 two comments. One is the statement was made that  
8 they tested in the regime that probability indicated  
9 was realistic, but I for one don't think that the  
10 original test protocols followed through on that.  
11 They are being revised until -- and I think that may  
12 get fixed.

13 Also, we did not object to a full-scale  
14 test. We say if you're going to do a full-scale  
15 test, it should be realistic and you should not  
16 include artifacts that come from some other program  
17 in that if you do a drop test as a simulation for  
18 being hit by a locomotive, you may raise as many  
19 questions about how you analyzed -- how you abstracted  
20 that to do the test conditions, so that -- so I  
21 think we feel if you are interested in a truck  
22 cask, you put a cask on a truck and crash it into a

1 solid concrete wall or whatever you want. But that 43  
2 you not confuse the issue by saying a truck accident  
3 going 70 miles an hour results in the following  
4 drop test on to some nonexistent target because now  
5 you are introducing all kinds of things which can  
6 raise questions again.

7       If you want to do a demonstration test, it  
8 ought to be a real one. Not only for speeds, but for  
9 conditions. One of the things you see that drives  
10 that comment is that in both the British test and the  
11 early Sandia test, regardless of what you think about  
12 the details, they both clearly demonstrated that very  
13 important factors, the energy absorption by the  
14 vehicles. So that if you say a truck is going 90  
15 miles an hour, but then you take a -- the cask is not  
16 in free flight. It's mounted on a truck and that's  
17 the sorts of things that are very difficult to  
18 convince somebody that you know how to model and  
19 that's why we think the test should be that kind of a  
20 test.

21       We don't object at all to a full-scale  
22 test. We are just saying that for the validation and

1 there again I hope I have said, I'm not sure what I 44  
2 say in a presentation, that this is primarily the  
3 reason we think we need some validation of colleges  
4 primarily for new and advanced at what might be  
5 unique cask designs. We don't think it's necessary  
6 to validate any of the existing casks.

7 CHAIRMAN MESERVE: It seems to me that  
8 you're -- there may be conflicting objectives if your  
9 purpose is to demonstrate that the cask can survive a  
10 real world accident, having a simulation that  
11 involves a truck running into a concrete barrier may  
12 be the way to demonstrate that.

13 If your purpose, on the other hand, is to  
14 validate the codes, then you want to have a  
15 controlled experiment where rather than having to do  
16 the difficult job of modeling the energy absorption  
17 that's occurring in the truck before you get to the  
18 energy in the cask, you know, you have got a very  
19 complicated problem to figure out your results.

20 And so doing a controlled experiment where  
21 you have got the variables all constrained is a way  
22 that you can, with a full-scale test, validate the

1 application of codes to that cask. It may not serve 45  
2 the public demonstration purpose that you want  
3 because of the then issues that get raised about,  
4 well, gee, if you applied this correctly when you  
5 think about the real world situation is. But it does  
6 seem to me that there is a conflicting objective in  
7 these tests and we need to think about it.

8 MR. LEVENSON: I agree completely. It's  
9 our perception though that, excuse me, the highly  
10 instrumented work to validate the codes can be done  
11 on models, scale models and significantly cheaper and  
12 done in multiples there. We recognize two separate  
13 objectives.

14 CHAIRMAN MESERVE: Dr. Hornberger, I must  
15 admit I'm a little bit perplexed myself in  
16 understanding the -- understanding shock-wave theory  
17 and I don't understand how you get the shock wave. I  
18 mean, is this the idea that you have some  
19 instantaneous temperature pulse when there is an  
20 intrusion of the magma into the drift or how do you  
21 generate a shock wave in a situation?

22 DR. HORNBERGER: So I won't pretend that

1 I'm going to lead you through all of the physics and 46  
2 mathematics, but in an arm waving sense, yes, so you  
3 have an intersection of a dike with the drift and the  
4 magma begins to flow down the drift and so you have a  
5 thermal pulse and you also have a compression --

6 CHAIRMAN MESERVE: Assumed to be a pulse?

7 DR. HORNBERGER: Pardon?

8 CHAIRMAN MESERVE: It's assumed to be a  
9 pulse?

10 DR. HORNBERGER: Yeah, it's a pulse, but  
11 the magma in the model, the magma continues to move  
12 down the drift, okay, and this is another part of the  
13 idealization in the model that doesn't seem to be  
14 quite right because as one of our consultants pointed  
15 out, this -- the magma is bound to be near its  
16 solidest. It's likely to be at a temperature where  
17 it's going to solidify pretty quickly and in contact  
18 with nada frock and in contact with canisters that  
19 are cold, you would very rapidly solidify.

20 But nevertheless, the analysis was of a  
21 magma proceeding down the drift. You have a thermal  
22 pulse, you have a pressure pulse generated by the

1 compression of the piston effect and that pressure 47  
2 wave would move down to the end of the drift, be  
3 reflected off the drift, come back, hit the oncoming  
4 magma front and just continued to be reflected back  
5 and forth in this perfect reflector.

6 CHAIRMAN MESERVE: With a resonating  
7 oscillator?

8 DR. HORNBERGER: You have a resonate --  
9 there you go. That's -- and so that's an arm waving  
10 explanation.

11 CHAIRMAN MESERVE: All right. You have  
12 concluded, this is an implausible scenario.

13 DR. HORNBERGER: This is an implausible  
14 scenario. I think everybody agrees.

15 CHAIRMAN MESERVE: I'll take reasonable --

16 DR. HORNBERGER: In fact, the people who --  
17 in fairness, the staff and the --

18 COMMISSIONER McGAFFIGAN: It's calculable.

19 DR. HORNBERGER: That's correct. That is  
20 correct. In fact, somebody pointed out that this is  
21 precisely one of the reasons why it's done because it  
22 can be calculated and the people who did the

1 calculation knew it was -- 48

2 COMMISSIONER McGAFFIGAN: Were these  
3 physicists doing this or --

4 DR. HORNBERGER: Were these what?

5 COMMISSIONER McGAFFIGAN: Were these  
6 physicists --

7 DR. HORNBERGER: I think I'll decline to  
8 answer that one.

9 CHAIRMAN MESERVE: Let me step back. There  
10 is a common theme -- this will be my last question.

11 There is a common theme in many of the letters that  
12 were written over the years including in your  
13 presentations here today, particularly your last one,  
14 about the need for the staff to develop simplified  
15 models and the need to do that so you understand what  
16 the important contributors to risks are and  
17 understand how they contribute to risk the ability to do  
18 the cross checks of the more complicated models and  
19 also of course that facilitates communication. This  
20 has been recurrent theme of what you have been  
21 telling us and telling the staff over and over again.

22 Do you have a sense that we are moving in



1 the right direction in achieving that objective? 49

2 DR. HORNBERGER: We definitely do. Maybe,  
3 John, you could answer that one because -- we just  
4 had a presentation yesterday on the continuing risk  
5 initiative.

6 DR. GARRICK: Yeah, I've been sort of a  
7 pain in the neck on that issue. And unfortunately I  
8 took enough physics to develop a high appreciation  
9 for simplified models in understanding phenomena and  
10 being able to apply it in other sets of boundary  
11 conditions and developing a sense of margins of  
12 safety and margins of performance and find it  
13 extremely valuable.

14 We have, as a committee, been pushing the  
15 NRC to -- and having NRC push DOE to address some of  
16 the performance assessment issues, such that the very  
17 complicated models could be abstracted into something  
18 that would have a greater physical meaning and be  
19 reduced to a set of parameters and conditions that  
20 would be more understandable and we can report to you  
21 that the NRC staff has clearly got this message and  
22 back -- reports the feedback that we have been

1 getting in the last several months has been very 50  
2 encouraging.

3 For example, we have suggested that there's  
4 all kinds of conditions that exist that lend  
5 themselves to simplified models in the case of the  
6 repository. Obviously, there's hundreds of  
7 radio nuclides that are involved, but there is a very  
8 small handful that dominate the risk.

9 One clear example of a simplified model  
10 would be to track two or three of these radio nuclides  
11 from waste mobilization through the unsaturated zone,  
12 to the saturated zone, to the biosphere, to the  
13 biological uptake.

14 In fact, these exercises are now being done  
15 and I think they are very impressive in terms of  
16 turning up the microscope on just what is important  
17 in the performance of the repository and also in  
18 signaling where the uncertainties are and where there  
19 needs to be greater attention.

20 So we are really just talking about taking  
21 a complex model and representing that with a simpler,  
22 but more physically interpretable model and as such

1 that that can be exercised in different ways and also 51  
2 be used as a means of communicating better to people  
3 what in fact is going on in the repository.

4 DR. HORNBERGER: I might add -- this might  
5 be a good place to add this. One of the areas that  
6 we think we need to look at a little more in-depth  
7 has to do with the actual dose calculation and we  
8 really think that, for example, some of the  
9 simplifying assumptions there really bear looking  
10 into to at least understand exactly what  
11 conservatisms may be introduced and of course we are  
12 very happy that Michael Ryan has joined us as a  
13 member and he is going to be leading some of that  
14 effort for the committee.

15 CHAIRMAN MESERVE: Good. Thank you very  
16 much.

17 Commissioner Diaz?

18 COMMISSIONER DIAZ: I was going to start  
19 with something different. But I believe it is so  
20 important that when people take a nine-dimensional  
21 problem and make it one dimensional, that at least  
22 that one dimension be the right one.

1 DR. WYMER: I was going to make the 52  
2 observation, Mr. Diaz, that you can't do the  
3 simplified model until you have done the complex  
4 model and understand what it is that you should  
5 simplify.

6 COMMISSIONER DIAZ: That is very important.  
7 That is very important. Thank you, sir.

8 I believe that, you know, from my  
9 viewpoint, the commission is looking at your advice  
10 at two different levels. One is the specifics of  
11 what's happened with this issue. But once in a while  
12 I would personally like for you to stand back and  
13 take a look at the whole thing and make sure that  
14 nobody is missing something that is important to the  
15 potential licensing of a high-level waste repository.  
16 Have you done that? Did you do that? It's -- you  
17 take a step back and look and say is everything being  
18 accounted for that the commission is going to have to  
19 really maybe make the decision on?

20 DR. HORNBERGER: We're sensitive to that.  
21 We really are. And, in fact, I know probably four,  
22 five years ago, we really tried to push on the staff

1 because when they had put forth their key technical 53  
2 issues and their list of key technical issues, we  
3 raised precisely that question.

4 I was sure that the key technical issues  
5 cover everything. And so we were sensitive to that  
6 issue. We tried to do it and we particularly will  
7 try to do it in terms of, for example, our  
8 upcoming workshops. That's one of the things that we  
9 will be looking at. Now having said that, just like  
10 everyone else, we tend to be consumed by issues that  
11 get put on our plate that tend to be much more  
12 specific than reflective. But we're sensitive to  
13 that and we try to do as good of a job as we can.

14 DR. GARRICK: In fact, we have even had  
15 discussions about backing off further than what  
16 you're suggesting. You're suggesting we back off and  
17 look at the total high-level waste or the total Yucca  
18 Mountain problem. We're talking about -- well, what  
19 we may be willing to do is to have a workshop that  
20 addresses the whole issue of radioactive waste  
21 management and what are considered to be a more  
22 subtle, but potentially future problems that we need

1 to consider.

54

2 The working group sessions have been  
3 extremely valuable in nurturing our understanding and  
4 being able to put these issues in context and so why  
5 wouldn't we want to apply that to the whole issue?

6 Well, let's reflect on where we are in the  
7 nuclear waste management field right now and ask  
8 ourselves and ask our outside experts and anybody  
9 else that has ideas on this, what are considered the  
10 most important issues downstream. Because there  
11 might be some sleeping giants there. There are  
12 people who think that low-level waste is a sleeping  
13 giant, and that we cannot allow ourselves to become  
14 so preoccupied with any single project that we don't  
15 realize that maybe there's some other issues out  
16 there that need some attention.

17 COMMISSIONER DIAZ: That's very true.  
18 Well, we certainly look forward to you to continue to  
19 look at the big picture and make us aware of any  
20 details. I used to have a technician that worked for  
21 me that every time I get very much into an issue he will  
22 come and whisper to me, have you thought about a

1 transporlator, which I don't know what a 55  
2 transporlator is, but he always kept me on my toes.  
3 He knew I did not know what a transporlator was.  
4       Going to the next level, and we talk about  
5 the nine key technical issues, as these issues  
6 develop, you obviously must be aware or trying to be  
7 aware or cognizant of any sub-issues that come,  
8 anything that is coming that -- you know, any of the  
9 technical issues that might have generated an  
10 offspring as a sub-technical issue that is  
11 important.

12       DR. HORNBERGER: Again, not to get too  
13 detailed, but one thing that comes to mind is of  
14 course -- and this is again an issue that the  
15 committee has tried to push on for years and the  
16 whole issue is one of coupled processes. And one of  
17 the concerns is of course when you put things in bins  
18 like key technical issues, do you potentially miss  
19 out on interactions. And again, yes, we're keeping  
20 our eyes open on this. There are a few things that  
21 are being investigated. We try to keep up to date on  
22 issues that arise. In terms of do we see anything

1 that is going to likely to pop up in the near future 56  
2 that is a real surprise. No, we don't see anything right now.

3 COMMISSIONER DIAZ: That's good. I know  
4 and I think we all have been concerned about the  
5 integration, just following on that question.

6 Do you have any additional recommendations  
7 that we should consider regarding how we improve the  
8 integration? Because I know that issue is vital to  
9 all of us. Is there anything that is not being done  
10 regarding the way the staff approaches the issue?

11 DR. HORNBERGER: I think that as John  
12 pointed out in his presentation on this risk insights  
13 initiative, that that was one of the things that we  
14 were really impressed with, favorably impressed with,  
15 was the fact that they had managed to get the  
16 technical people within each KTI in communication  
17 with the people who are doing performance assessment  
18 and they really had some very good communications. I  
19 got the impression that some of the communications  
20 were probably pretty active at one time or another so  
21 that people weren't really holding back.

22 I think that also with the Yucca Mountain



1 review plan, the integrated issues and sub-issues, I 57

2 think that the staff really is on the right path.

3 But again, we continue to be -- encourage that.

4 COMMISSIONER DIAZ: Dr. Garrick, I do

5 appreciate the, let me call it the stubborn and continuous and

6 systematic insistence on maintaining risk insights and I do

7 appreciate that. I think that's very valuable.

8 Provide some stability on the processes.

9 DR. GARRICK: I'm glad somebody does.

10 COMMISSIONER DIAZ: It's not easy.

11 I know that -- I'm noticed in the last bullet

12 on slide 9 that you are concerned or think that the

13 implementation of risk insights into the resolution process

14 needed some upgrade in it. And the recommendation is

15 there. I believe the staff is very agreeable to it.

16 But when you look at it again, taking a step back,

17 why do think that happened? What led to this

18 missing, this importance of the implementation.

19 DR. GARRICK: Yeah that's a good question.

20 I think that the truth is that probably what they did

21 achieve was as a first step maybe the most important

22 thing to do and that was to get the different groups

1 to work with each other, to hear out the opinions of 58  
2 the people, for example, that have been living with  
3 the KTI process from its beginning, long before the  
4 risk perspective was emphasized. To hear out what  
5 the performance assessment people are finding out and  
6 to search for how you map from one to the other. And  
7 of course, one of the things we've learned is that  
8 you don't map at the KTI level. That you do that at  
9 the sub-issue and even the sub-sub-issue level. But  
10 I think that the big step has been taken to break  
11 down some of the natural barriers that create when  
12 groups are very intentionally involved in work and  
13 trying to solve problems by getting those groups to  
14 work together. And I think now what we are beginning  
15 to see, especially with respect to the use of results  
16 from the PRA, some a genuine effort to connect the  
17 two. To connect the results of the PRA to the  
18 sub-issues in the agreements. So I think that is  
19 happening.

20 DR. WYMER: I'd like to add to that. My  
21 understanding of what happened was they put the group  
22 together to look at the risk initiatives and they

1 didn't establish at the outset a common basis of what 59  
2 they were looking at. They didn't define what the  
3 risks were that they were addressing and it was maybe  
4 premature to do that. But each person actually took  
5 his own view of what risk he was addressing and put  
6 that into the pot and so there was a whole spectrum  
7 of risk and there was not a common basis of which to  
8 go forward. And I think now that step two is to  
9 modify that and everybody start at an agreed upon  
10 common basis.

11           COMMISSIONER DIAZ: But it's probably good  
12 lessons learned from that exercise. Okay. Thank  
13 you.

14           Let's see. Milt, I know we talk with the  
15 Chairman quite a bit about the full-scale, the  
16 multiple tests and I think I -- you know, I have a  
17 little bit of an understanding of the modeling  
18 capabilities. I'd be interested in some time may be  
19 you can send us some of those workshop things. I'd be  
20 fascinated by seeing the capabilities that apparently  
21 are better than what you thought they were and  
22 apparently better than what I thought they are,

1 because I thought that was in many ways a full-scale 60  
2 test. It to me is vital not only for the credibility  
3 of the larger test. But if we can do --  
4 significantly improve or obtain significantly  
5 improved results from small scale testings, that should be  
6 in addition to the full-scale test. Would you agree  
7 with that?

8 MR. LEVENSON: Yes, I think they're two  
9 separate objectives, as the Chairman mentioned. And  
10 we'd certainly make available to you the information.  
11 It's just kind of incredible with those of us that  
12 are sometimes associated with calculations as to the  
13 step forward that has occurred and one of the charts  
14 used by the Livermore people to show where they  
15 stand in their computation capability measured in  
16 flops, which is a unit irrelevant for the average  
17 user of a computer and word processing. It's only  
18 for floating desk point calculations pointing out  
19 that a current Mackintosh with a pentium processor is  
20 equivalent to, for that type of calculation, to --  
21 the second generation of Cray, the Cray YMRP.  
22 Unbelievable and they're way beyond that. And they

1 have also -- they have applied as I mentioned I think 61  
2 to other things like dams. And I think what -- if we  
3 take decisions or evaluations made by other people,  
4 people have decided that this simulation is adequate  
5 to make sure that the bombs that are on railroad cars  
6 or trucks going all around this country are safe and  
7 they won't prematurely detonate. And at the same  
8 time that they detonate when called upon by the  
9 military. That's so much more a public safety issue,  
10 that that advanced computational ability we think  
11 ought to be looked into.

12 COMMISSIONER DIAZ: Thank you, sir.

13 Dr. Hornberger, very quickly on -- you seem  
14 to imply that when you talk about aeromagnetic  
15 anomalies and the igneous activity issue, that  
16 they're different interpretations. Are you trying to  
17 say that it could be interpreted that there is really  
18 no significant likelihood of volcanic activity?

19 DR. HORNBERGER: No. What I wanted to say  
20 was that there is a possibility that there would be  
21 no significant change to our estimates of a  
22 probability of volcanic activity.

1 COMMISSIONER DIAZ: Okay. All right. 62

2 And I know you've been trying to be very  
3 political using repeatedly the word idealized  
4 models, you mean unrealistic or you simply mean  
5 nonphysical?

6 DR. HORNBERGER: I think one has to be a  
7 little careful because we know that there are no  
8 frictionless pendulums. And yet these tend to be of  
9 use in teaching basic physics, as we all know, right?  
10 And I think that the -- perhaps if I could put a good  
11 spin on it, I think that the intent of the  
12 NRC-sponsored research was that. It was to say,  
13 okay, if we make all these idealizations, what are  
14 the potential consequences. And it was more to raise  
15 a flag than to say -- they really didn't put this  
16 forward as a realistic calculation. They knew it was  
17 not a realistic calculation. So it was both  
18 idealized and unrealistic, but it was known to be so  
19 and it was, I think, put forward as an example  
20 calculation. And, again, I think as Commissioner  
21 McGaffigan said, it was done because it could be  
22 done.

1 COMMISSIONER DIAZ: That's dangerous. 63

2 Dr. Wymer, in your presentation you talk  
3 about long-term tests. Could you define what long  
4 terms should be for this commission?

5 DR. WYMER: I probably can't do as good a  
6 job as you can. Long term as far as testing is  
7 concerned really has to go up until the time of  
8 closure for the repository. After that, you have no  
9 real opportunity to perform realistic test in the  
10 repository. You can still continue to run things  
11 like corrosion tests on the waste package material  
12 beyond the closure time. But those would just really  
13 be to provide assurance that the statements that were  
14 made by DOE and that were accepted, if they were by  
15 NRC for the license, were in fact still holding,  
16 that the calculations were still to be believable.  
17 So long term in one sense is closure of the  
18 repository. But some things could go on beyond that  
19 and will.

20 COMMISSIONER DIAZ: Okay. Thank you,  
21 Mr. Chairman.

22 CHAIRMAN MESERVE: Commissioner McGaffigan?

1           COMMISSIONER McGAFFIGAN: Thank you,           64  
2 Mr. Chairman. There's a procedural issue I'm going  
3 to start with that bears on where the chairman was  
4 talking with you. I read your correspondence  
5 with Mr. Loux about the November  
6 workshop. And I'll tell you, I didn't find  
7 your answer totally persuasive. You know,  
8 Mr. Garrick and I have had a lot of experience with WIPP over  
9 the years, and my recollection is that the academy  
10 never had meetings without the EEG getting invited to  
11 present their view, Bob Neill, whoever.  
12 There was a technical group in the case  
13 of New Mexico. It was established as a result of a  
14 consent agreement entered into, I believe, in '81 or  
15 '82. And Nevada doesn't have an EEG, although it  
16 has a coterie of what they believe to be, solid  
17 technical experts who are going to espouse their  
18 view. And so I think it's a bit of a mistake to not  
19 involve them routinely in your meetings, and in  
20 particular, in this transportation meeting and I'd  
21 just be interested in your reaction to the procedural  
22 point. As I said, I read your letter, but I believe



1 you made a bit of a mistake in not having Nevada 65  
2 people there and as a matter of going forward, I  
3 think you'd be well suited sort of each time you had  
4 a meeting, call up Mr. Loux and say do you have  
5 experts that you want to put before us? They may be  
6 outside the mainstream, but that doesn't  
7 mean that their point of view isn't going to be heard  
8 by important stakeholders. And for you all, part of  
9 your function I think is to hear all the different  
10 points of view because certainly part of our function  
11 is to hear all the different points of view.

12 So what's your reaction?

13 MR. HORNBERGER: We will take your point to  
14 heart. I think that we probably did learn something  
15 from this in terms of particularly contentious issues  
16 that we do have to be -- to exercise great care, just as  
17 you said and I think that we will take your advice in  
18 the future.

19 DR. GARRICK: I think one thing that's  
20 important to observe is that we seldom have had a  
21 meeting where, especially in Nevada where there  
22 wasn't representation from the state of Nevada and we

1 have been very enthusiastic when we've met with them 66  
2 and inviting them to our other meetings and what have  
3 you. So there has been a presence in a great number  
4 of our meetings and we have listened and encouraged  
5 their participation numerous times. So it isn't as  
6 if that this is --

7           COMMISSIONER McGAFFIGAN: I know, but it's  
8 one thing to encourage it and even mention that it's  
9 coming, and again I read the whole letter.  
10 You had mentioned it was coming at the previous  
11 meeting. There was opportunity for stakeholder  
12 involvement if they had come on their own without  
13 being given the -- you know, seat at the table.  
14 And they didn't avail themselves of that. On the  
15 other hand, it's -- as I say, I think you'd be better  
16 off each time just as in the case of  
17 WIPP, you probably called up Bob Neill each time and said  
18 do you have something to say on this issue. I think  
19 calling up Bob Loux and saying do you have  
20 something to say on this issue. Do you have some  
21 expert you'd like to have participate is not an  
22 unreasonable -- I mean, I think it's the best

1 approach.

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2 DR. GARRICK: Yeah, and I think that WIPP  
3 was a good model and as George says, you make a very  
4 good point and we should be more -- we should reach  
5 out more.

6 DR. HORNBERGER: But we did for example  
7 several years ago. We had another meeting where we  
8 focused on transportation. In fact, what we focused  
9 on was the idea of risk communication. We held it in  
10 Nevada. We specifically organized to have not just  
11 state representatives, but representatives of  
12 counties. We organized the whole meeting so that we  
13 did have broad input. No, no, no, I'm not arguing --

14 COMMISSIONER McGAFFIGAN: This meeting was  
15 a particularly dangerous one for you all to not have  
16 more involvement because -- you know, Senator Durbin  
17 introduced a bill just before the Senate left session  
18 where as a layman he took a stab at what our criteria  
19 should be for, you know, certifying casks. I suspect  
20 you all might not agree with some of the criteria. I  
21 don't necessarily agree with some of the criteria.  
22 But I'll tell you, there's a lot of people who

1 believe that this is relatively understandable 68  
2 compared to trying to understand the total system  
3 performance assessment and getting into some of these  
4 KTIs. You know how robust the cask should be. You  
5 know, what's the biggest drop over a bridge in the  
6 west headed toward Yucca Mountain on a highway or on  
7 a railroad and why shouldn't the cask be able to survive  
8 the drop from that cliff is a question that people  
9 are going to ask you. And we're going to have -- all  
10 of us -- we're going to have to answer, and so did  
11 this issue of designing what's the deepest body of  
12 water. If you look at Mr. Loux's letter to the  
13 chairman of December 9th, what's the deepest body of  
14 water that a barge may be going to have to navigate  
15 in order to ship spent fuel to Yucca Mountain. And  
16 what if the barge sinks in that deepest body of  
17 water? Should it be designed to that deepest body of  
18 water?  
19 Those are -- this is an area where as I say  
20 there are a lot of people who are going to feel quite  
21 confident in their ability to help us design these  
22 tests and will demand answers to those sorts of

1 questions.

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2 DR. HORNBERGER: Yeah, and I wasn't  
3 disagreeing with your main point. I just was again  
4 indicating that what we did in organizing this one --  
5 and again in retrospect, we probably would have done  
6 it just as you said. But we were organizing it to  
7 focus on very technical issues and not on some of the  
8 issues that you raise.

9 COMMISSIONER McGAFFIGAN: But I'll make a  
10 bet that Nevadans believe that they have people who could  
11 contribute to --

12 DR. HORNBERGER: No, no, and I think you're  
13 right and I think you're right, and I think again in  
14 retrospect. And as I said, we have invited Mr. Loux  
15 to make presentations in the future and if we learn  
16 new things, we would certainly report that to him.  
17 And we take your main point that we should be more  
18 circumspect in the future.

19 COMMISSIONER McGAFFIGAN: And I would have  
20 even -- you know, I don't know on this issue, this  
21 other workshop on the volcanism issue and if they had  
22 anybody that wanted to send to that, I would have had

1 them there as a participant. 70

2 Going to -- staying on this issue of  
3 transportation, Dr. Levenson, I share the Chairman's  
4 view. We face -- you know, you talked about  
5 these teraflop, hundred teraflop, or  
6 whatever they're at, there will be a thousand  
7 teraflop, whatever a thousand teraflop is soon.

8 But in the case of nuclear weapons, they  
9 have a whole bunch of tests. They have a whole bunch  
10 of data points that they are trying to simulate with  
11 these on their computers nowadays as part of the  
12 stockpile stewardship program.

13 In the case of the casks, we don't have the  
14 full-scale tests and getting some data points at the  
15 full-scale end of the spectrum, there can be arguments  
16 about those data points are, but I think we need to  
17 have them and I -- you know, otherwise you -- I mean,  
18 I believe that what we have done -- I mean, I  
19 testified with Chairman back in May or so to the  
20 Congress and we do believe that our current sub-scale  
21 modeling and all this is quite good. We don't test  
22 World Trade Centers to failure or other buildings or

1 bridges or whatever. We use sub-scale models in 71  
2 designing them, but we -- at some point, if it's  
3 feasible, you presumably want to test at full-scale  
4 and yet you say you're not against that, but even testing  
5 it full-scale in the regime the staff wants to test I  
6 think may make some sense.

7       Let me ask, Dr. Garrick, you've mentioned  
8 you have a lot of experience with TRUPAC.  
9 In Mr. Loux's December 9th letter he says that the  
10 state of New Mexico was very heavily involved in  
11 designing the tests that were done on the TRUPAC  
12 canisters and I don't know whether -- you said you  
13 had these people, the WIPP experience in mind at  
14 this workshop. Was the testing of TRUPAC what you  
15 guys would call risk informed or was it in  
16 non-realistic regimes where as a result of the public  
17 process they followed to design those tests they got  
18 out into a regime that you all wouldn't have been  
19 comfortable with?

20       DR. GARRICK: Well, they certainly were not specked  
21 against any kind of risk model, but you're absolutely  
22 correct that the environmental evaluation group, the

1 EEG group, was a party of the process, and I 72  
2 considered that organization to be one of the better  
3 organizations that I have seen in keeping focused on  
4 the real issues and the technical issues.

5 I think as a matter of fact they  
6 contributed a great deal to the issues not going  
7 astray with respect to the technical issues that  
8 demonstrate safety. But, no, I don't think those  
9 tests were necessary -- were guided by any  
10 fundamental risk --

11 COMMISSIONER McGAFFIGAN: I don't think  
12 they were either. We may be about to  
13 do the same thing despite your advice  
14 to the contrary. One issue I know that came up at  
15 your workshop. I had a staffer who attended part of  
16 it. You gave a fellow from the American Rail  
17 Association a pretty hard time about the notion of  
18 dedicated trains and I'll tell you, I speaking as one  
19 commissioner, don't know why we don't use dedicated  
20 trains. I think dedicated trains make a lot of  
21 sense. You get the best stock. You get the best  
22 routes. You don't have to hang around waiting for



1 locomotives to be switched in vulnerable places where 73  
2 you might be subject to attack by terrorists. And  
3 you ensure there is no flammable cargo on the train  
4 so that, you know, if you get in a tunnel and a fire  
5 occurs, you are not going to be there. You can  
6 probably even impose rules that the train will not  
7 enter a tunnel if there is another train with  
8 flammable cargo in the tunnel until that flammable  
9 cargo has cleared, if you are using dedicated trains.

10         So the resistance that I understand you all  
11 have to dedicated trains I would like you to explain  
12 to me.

13         MR. LEVENSON: Well, I think there are two.  
14 One wasn't ours. It was quoted by I think the  
15 participant responsible for the Navy shipments. They  
16 don't use dedicated trains for a completely opposite  
17 interpretation of the terrorist issue. They say a  
18 dedicated train is a flag and a target. Everybody  
19 knows where is it is, what it is, et cetera and they  
20 much prefer to --

21         COMMISSIONER McGAFFIGAN: You think we are  
22 going to be able to hide these casks, these two

1 hundred ton casks?

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2 MR. LEVENSON: No, no, but you can't hide  
3 it as it goes by, but from the standpoint of people  
4 planning, a dedicated train takes a lot of planning,  
5 a lot of information. Everybody knows, there's  
6 published schedules, the track has to be cleared  
7 because a train is going to be going through there  
8 next Thursday and this is an area about which I know  
9 nothing. But I just say that this is the view of  
10 some of the people who are concerned about security.  
11 It's for security reasons they prefer not. I suspect  
12 we don't ship our nuclear weapons in dedicated trains  
13 either. We don't ship Navy fuel in dedicated trains.  
14 The other part is strictly the -- I think  
15 one of economics, the man from the railroad  
16 association at the end of the day, I don't know  
17 whether your staffer reported to you at the end of  
18 the session, he said he wanted to make it clear that  
19 he didn't think dedicated trains was necessary for  
20 safety to have dedicated trains. There were other  
21 issues and the railroads liked, and what they may  
22 like is the extra fees they charge.

1           COMMISSIONER McGAFFIGAN: Yeah, I think the 75  
2 railroad folks who have been arguing for dedicated  
3 trains, it's quick and easy to say they're doing it  
4 because they're going to make more money. But I  
5 think they make a fair number of persuasive arguments  
6 for dedicated trains.

7           In the security issue, I understand it can  
8 cut both ways, but it's hard with these 200 ton  
9 casks, you are going to know what that thing -- I  
10 don't think there is anything else on our rail system  
11 that's going to look like what one of these spent  
12 fuel casks once they get on the rail system some day.

13           Is there anything else that looks like a  
14 spent fuel cask?

15           DR. GARRICK: Well, there's a lot of things  
16 that are covered that -- you know, I have observed  
17 trains as I travel around that you ask yourself I  
18 wonder what that is that certainly could be like  
19 that.

20           Many years ago, I participated in a set of  
21 hearings with the ICC on this whole issue and all I  
22 can say is that when we tried to look at this

1 extremely objectively and tried to let the evidence 76  
2 speak, that any analysis that we perform on the basis  
3 of risk at least, that dedicated train concept could  
4 not be justified. And --

5 COMMISSIONER McGAFFIGAN: But you're  
6 looking at risk in a narrower sense not including  
7 security considerations, right?

8 DR. GARRICK: Well, at that time we  
9 certainly weren't looking at security like we're  
10 looking at it now, that's correct. But at the same  
11 time, there's a lot of people that agree with you,  
12 but I think that the one thing that we have to take  
13 into account if we're genuinely interested in risk is  
14 that there is a tremendous amount of hazardous  
15 materials shipped on trains and if on the -- and if  
16 we can justify dedicated trains for spent nuclear  
17 fuel or high-level radioactive waste, and considering  
18 the safety assessments that clearly can be done and  
19 done competently, then we may end up with a whole  
20 bunch of dedicated trains for other set of -- other  
21 hazardous materials.

22 COMMISSIONER McGAFFIGAN: I understand that

1 argument. I mean, the basic argument is if we can 77  
2 ship phosgene and chlorine around on trains where  
3 you can kill lots of people -- if you can ship  
4 those on normal trains, why can't you  
5 ship spent fuel which can't kill anywhere near the  
6 number of people, isn't anywhere near as dangerous.  
7 But I think that there's a different --  
8 unfortunately, there's a different standard for us  
9 and we can protect this stuff better. Phosgene  
10 and chlorine and whatever are very, very, very  
11 difficult to protect. They never designed the  
12 canisters from a security perspective. So, you know,  
13 you would be asking the impossible there.  
14 We run into the same issue we have been  
15 trying to get compensatory measures for highway route  
16 control quantities of radioactive material for months  
17 and we are running into resistance from our sister  
18 agencies on the grounds that why are you being so  
19 protective of a million curies of cobalt. You know, heck,  
20 phosgene shipments are a lot worse.  
21 I think the Chairman tried that argument  
22 in a slightly different form with the

1 Environment and Public Works Committee this spring and it 78  
2 didn't go over real well, the notion that the real  
3 issue -- that, you know, we are much better than the  
4 chemicals so leave us alone.

5 DR. HORNBERGER: I just want to correct one  
6 thing and that is I don't think that the ACNW is on  
7 record, and I don't think that we are, as you have  
8 suggested, opposed to dedicated trains.

9 COMMISSIONER McGAFFIGAN: Trust at the  
10 workshop, you gave the guy a real hard time.

11 DR. HORNBERGER: We did give him a hard  
12 time, but again it's in the context of understanding  
13 the risks.

14 COMMISSIONER McGAFFIGAN: It's like me  
15 giving you a hard time.

16 DR. GARRICK: It's in the context of what's  
17 the evidence, you know. It seems to me that you have  
18 to fall back on that. There are other -- there are  
19 extenuating reasons and you have articulated them  
20 very well. The legacy of this being something very  
21 different is there and we have to deal with it.

22 COMMISSIONER McGAFFIGAN: Well, I don't

1 want to belabor it, but, you know, the West 79

2 Valley waste going to Idaho is going to go in a

3 dedicated train. DOE uses dedicated trains a lot,

4 but I'll leave it at that.

5 MR. LEVENSON: Let me just make two

6 comments. One is, I think the reason we pushed on

7 him is that he started out with leaving a perception

8 with some of us that there was safety issue and

9 dedicated trains made it a lot safer and the question

10 was what is the evidence for that? The other thing

11 that we should note is even though it's not a

12 requirement to use dedicated trains, some of the

13 utilities that have shipped fuel have done so and so

14 it's made -- they may end up doing it whether it's a

15 requirement or not, but from a standpoint of the

16 risks and so forth, we just couldn't find evidence

17 for it.

18 CHAIRMAN MESERVE: Mr. Merrifield?

19 COMMISSIONER MERRIFIELD: Thank you,

20 Mr. Chairman.

21 Many of the issues have already been

22 addressed. I have principally some comments I would

1 like to make and I have one closing question that I 80  
2 want to ask. The first comment I want to make is I  
3 want to thank ACNW for what I thought was a very  
4 thoughtful, measured, and useful presentation today.

5 I also want to note the degree to which  
6 there is an appreciation and a sensitivity to the  
7 issue of public communications. It was reflective of  
8 the comment that was made by the chairman and I  
9 wanted to recognize that.

10 The second comment I wanted to make was and  
11 a couple of these are related to comments either made  
12 by other commissioners. Commissioner Diaz made a note  
13 of a need to be reflective in looking at these issues  
14 and I don't disagree and I agree with the  
15 commissioner in that regard. I think it's useful for  
16 ACNW to take a look at these things independently.

17 I would only footnote that as you weren't  
18 being reflective before you go charging off into an  
19 area that you continue to appropriately coordinate  
20 with the commission to make sure that you are working  
21 on things that the commission would find useful in  
22 terms of making our policy decisions.



1           The third comment I would make is regarding 81  
2 full-scale tests and my comments are reflective of  
3 those made by the chairman and Commissioner  
4 McGaffigan. I would say up front I have a high  
5 confident level and a great degree of confidence as  
6 the ACNW has on the use of smaller scale tests and  
7 the use of computer modeling. The degree of  
8 sophistication that we have available to our agency  
9 and available in a scientific community to use those  
10 models and those computer databases and technologies  
11 to come up with scaled results that are incredibly  
12 accurate in their prediction of what full scale tests  
13 would be like. I feel very comfortable about that as  
14 the committee is.

15           I think my sense of where the commission is  
16 coming from is reflective, and I'll use an analogy,  
17 sort of reflective of an individual who is buying a  
18 car. You could meet with the best salesman and the  
19 best automotive engineer who explained to you  
20 precisely what that car is going -- how it's going to  
21 work and how it's going to perform under a variety of  
22 tests and you can do with a great degree of

1 precision, but convincing the person to actually buy 82  
2 the car is going to require them to actually sit in  
3 the car and drive it.

4 I think that is reflective of -- and we  
5 have been focusing a lot on the state of Nevada. But  
6 when we get into the issue of transportation of  
7 casks, we must also be mindful of our stakeholders in  
8 states like Illinois, Missouri, Oklahoma and  
9 elsewhere. And I think it is while we in the  
10 confines of this room or in the confines of the  
11 community which we involve ourselves can have that  
12 comfort level about the models and the comfort level  
13 about the technologies and our predictive  
14 capabilities using smaller scale, when you ask the  
15 average person on the street who lives in Missouri or  
16 Illinois or Oklahoma, it's going to be a more  
17 realistic full-scale test.

18 It's going to give them the information and  
19 increase their confidence about that we are doing the  
20 right thing and I think that is in part reflective of  
21 certainly where I'm coming from in my sense of the  
22 comments of the other commissioners.

1           My fourth comment is regarding the issue of 83  
2 dedicated trains and I say this principally for the  
3 -- just so that the record is clear. When I first  
4 started working up on Capitol Hill, among the issues  
5 that I was intended to be -- to advise a U.S. Senator  
6 on was the issue of transportation. And at the time  
7 when I was years younger than I am now, I certainly  
8 thought I was doing that well and providing lots of  
9 information. Time brings with it knowledge and I  
10 reflect now on the fact that I did not know as much  
11 as I probably thought I knew at the time.

12           The only comment I would make on this and  
13 so you get a balance on the commission, I certainly  
14 do not have an opinion right now on whether dedicated  
15 trains versus nondedicated trains is the right thing  
16 to do. I have an open mind on it and certainly  
17 appreciate your comments and certainly want to hear  
18 from the other stakeholders and staff about their  
19 recommendations. But I just didn't want to leave --  
20 and every commissioner is free to have their own  
21 position on this, but I didn't want to leave you with  
22 the impression that that was -- that view of

1 dedicated trains was one that was unanimously 84

2 supported by the commission.

3 My question relates to slide 42. On the  
4 first bullet you talk about supporting the commission  
5 with an independent review of DOE license  
6 applications. And my question is a simple one and I  
7 direct this to the Chairman, but other members can  
8 certainly answer it as well: Do you believe that you  
9 have access to the necessary information and the  
10 necessary resources to provide an independent and  
11 unbiased review of high-level waste issues to the  
12 commission? I can repeat that if you want.

13 You have access to the necessary  
14 information and resources to provide an independent  
15 and unbiased review of high-level waste issues to the  
16 commission?

17 DR. HORNBERGER: I think the simple answer  
18 would be yes. You have taken it a bit out of the  
19 context of the license application, which has their  
20 other potential issues surrounding that, but --

21 COMMISSIONER MERRIFIELD: I have. I have.

22 DR. HORNBERGER: But I do think that, yes,

1 I think we do have the resources and the access to 85  
2 the information that we need to do our job properly.

3 COMMISSIONER MERRIFIELD: Let's, let's --  
4 and you make a good comment. Let's focus it on the  
5 license application. Would your answer be any  
6 different?

7 DR. HORNBERGER: No, I don't think so, but  
8 we do recognize that -- and in fact we are moving  
9 forward. We have to plan what our role may be in  
10 supporting you in terms of the license application  
11 and we are going through discussions now to try to  
12 come forward to bring to you a proposal on exactly  
13 how we would do that and we anticipate and we hope  
14 that we will do that certainly this winter some time.

15 COMMISSIONER MERRIFIELD: And that's not to  
16 say this won't evolve.

17 DR. HORNBERGER: That's right.

18 COMMISSIONER MERRIFIELD: What I'm saying  
19 is right now, are we giving you the resources and are  
20 you getting the information necessary to advise us?

21 DR. HORNBERGER: Yes. And you know that we  
22 have complained a little bit in the past of not

1 having access to predecisional information on a 86  
2 timely basis or only in terms of where we can do it  
3 as individuals and not as a full committee. I still  
4 have some concerns about how we can move forward on  
5 that because I think to give the best advice, we do  
6 have to have discussions of a full committee.

7 On the other hand, as I indicated in my  
8 Yucca Mountain Review Plan Report, we did interact I  
9 think pretty effectively as an individual basis  
10 dealing with predecisional information and then that  
11 certainly fit into the review when we -- when the  
12 document was publicly available. So I still have  
13 some of those concerns, but still the answer to your  
14 question is yes.

15 COMMISSIONER MERRIFIELD: Yes. Great.  
16 Thank you, Mr. Chairman.

17 CHAIRMAN MESERVE: Good.

18 MR. LEVENSON: If I would, I'd like to make  
19 one comment on one of your comments. We did not  
20 raise the issue of dedicated trains in our  
21 presentation. Our draft letter, which I suppose I  
22 shouldn't discuss in public because we haven't voted

1 on it yet, but since I'm not discussing what's in it, 87  
2 I'm discussing what's not in it, I think it's okay,  
3 does not make any recommendations in connection with  
4 dedicated trains. It was just that we gave someone  
5 -- we pressed someone who was recommending them to  
6 what was the basis of his recommendations and it was  
7 -- it is not in the letter and we are not  
8 recommending dedicated trains.

9 DR. HORNBERGER: So we have an open mind as  
10 well.

11 COMMISSIONER McGAFFIGAN: I have the only  
12 closed mind.

13 CHAIRMAN MESERVE: I'm glad you  
14 acknowledged that.

15 Well, we have come to the end of a very  
16 helpful meeting. Again, I would like to thank you  
17 very much for our efforts. We know that the task  
18 that we present to you and the intrusion on your  
19 lives and unfortunately as we move forward on  
20 consideration on Yucca Mountain matters, it is likely  
21 that the load will get heavier. And on behalf of the  
22 commission, I really do want to express our very deep

1 appreciation for all of your efforts. 88

2 With that, we are adjourned.

3 (The proceedings concluded at 11:18 a.m.)

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