

1 UNITED STATES OF AMERICA  
2 NUCLEAR REGULATORY COMMISSION  
3 OFFICE OF THE SECRETARY  
4 \*\*\*  
5 ADVISORY COMMITTEE ON NUCLEAR WASTE  
6 MEETING WITH THE U.S. NUCLEAR REGULATORY COMMISSION  
7  
8  
9

10 Commissioner's Conference Room  
11 White Flint Building 1  
12 11555 Rockville Pike  
13 Rockville, Maryland  
14

15 Wednesday, December 15, 1999  
16

17 COMMISSIONERS PRESENT:

18 RICHARD A. MESERVE, Chairman  
19 GRETA J. DICUS, Commissioner  
20 NILS J. DIAZ, Commissioner  
21 EDWARD McGAFFIGAN, Commissioner  
22 JEFFREY S. MERRIFIELD, Commissioner  
23  
24  
25

2

1 STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:

2 KAREN D. CYR, General Counsel  
3 ANNETTE L. VIETTI-COOK, Secretary  
4 DR. B. JOHN GARRICK, ACNW Chairman  
5 DR. GEORGE M. HORNBERGER, ACNW Vice-Chairman  
6 DR. RAYMOND G. WYMER, ACNW Member  
7 MR. MILTON LEVENSON, ACNW Consultant  
8 DR. JOHN T. LARKINS, Executive Director - ACRS/ACNW  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

3

1 P R O C E E D I N G S

2 [9:36 a.m.]

3 CHAIRMAN MESERVE: Let me turn now to the way we  
4 are going to spend the rest of our morning, which is to -- a  
5 meeting with the Advisory Committee on Nuclear Waste.

6 I am particularly pleased to do this, in part  
7 because I am -- across the table from me are two individuals  
8 with whom I have spent a lot of time over the past several  
9 years on waste-related matters, and I'm very pleased to have  
10 the opportunity to deal with both John Garrick and George  
11 Hornberger in this context as well as the others in which we

12 have worked over the years.

13 I'm also looking forward to getting to know other  
14 members of the advisory committee.

15 I understand that the committee did brief the  
16 Commission in March on issues relating to its work, that  
17 since that time it has had a -- meetings with regard to the  
18 DOE's examination of Yucca Mountain and had meetings in Las  
19 Vegas and met with a variety of stakeholders, and we welcome  
20 the opportunity to hear from you about that and the other  
21 work that you have underway.

22 Mr. Chairman, before I turn the matter over to  
23 you, why don't I inquire as to whether my fellow  
24 Commissioners would like to make an opening statement?

25 If not, why don't we proceed?

4

1 DR. GARRICK: Thanks, Chairman Meserve. It's a  
2 pleasure to be here. The committee is anxious to get back  
3 on a more frequent schedule of interacting with the  
4 Commission, because the feedback is always extremely  
5 valuable in inspiring us to be on target on some of the  
6 issues.

7 Today we're going to cover five items, one on the  
8 business of risk communication. We're going to discuss a  
9 white paper that a committee -- a former committee member  
10 prepared on the repository design. We're going to talk  
11 about Part 63, a special category of decommissioning called  
12 rubblization, and then we're going to end the meeting with  
13 some discussion about our planning process and how we  
14 conduct that.

15 So, our first item is something called risk  
16 communication.

17 As is generally known, the field of risk has kind  
18 of matured into three major components -- risk assessment,  
19 risk communication, and risk management -- whereby, in risk  
20 assessment, we try to quantify what the risk is, and by risk  
21 communication, we try to improve the processes and the  
22 methods by which we communicate the results of risk  
23 assessments, and then risk management is basically the issue  
24 of taking action and implementation.

25 So, let me start with my first exhibit on page 2,

5

1 with an overview.

2 The committee identified risk communication as a  
3 first-tier priority in its 1999 action plan, and I'll come  
4 back to that in a little while as to why.

5 In the course of dealing with this subject, we  
6 have met with a lot of organizations, agencies, and  
7 institutions, including the Nuclear Energy Institute, the  
8 Environmental Protection Agency, and the NRC.

9 In order to be in a better position to appreciate  
10 the discipline of risk communication, we also subjected  
11 ourselves to a little training by a professional risk  
12 communicator, and then, perhaps the highlight of the year  
13 with respect to risk communication was our one-day  
14 roundtable meeting and evening meeting with stakeholders and  
15 the public in Las Vegas, and I need to point out that we are  
16 in the process of developing our observations and  
17 recommendations, so this is basically a work-in-progress  
18 report.

19 View-graph number three -- as to why we identified  
20 risk communication as a first-tier priority -- and I should  
21 point out that we do this every year.

22 So, what we're talking about here is basically the  
23 calendar year 1999, but we make a strong tie between risk

24 communication and public involvement and participation in  
25 the regulatory process, and so, in a sense, we have tried to

6

1 let the NRC strategic plan be one of the guidelines for  
2 establishing priorities, and NRC states in its strategic  
3 plan that building and maintaining public confidence is  
4 critical for achieving its mission and vision and that  
5 fundamental to that process, of course, is the involvement  
6 of the stakeholders.

7 As far as the international experience is  
8 concerned, the committee spent some time in Germany in 1998  
9 learning about the German program, the Swiss program, the  
10 French program, and the program in Sweden, and while the  
11 approaches taken by the different nations have differences,  
12 there was one thing in common with all of them and that is  
13 the issue of public participation and involvement in the  
14 process and that if you were to ask any of them what was the  
15 major obstacle, most of them would probably answer it was  
16 winning public confidence in what we're doing.

17 Also a highlight in 1998 as far as this issue was  
18 concerned -- and maybe the meeting that really captured our  
19 interest and imagination about it -- was a meeting we had at  
20 Yucca Mountain with stakeholders in Amargosa Valley, and one  
21 of the things that we attempted to do in this meeting was to  
22 try to, after we listened to the public, feed back to them  
23 what we thought we heard, and there seemed to be a great  
24 deal of appreciation for that, that we (a) took the time to  
25 do that and (b) that apparently our feedback was pretty much

7

1 on target with what they had identified as their principle  
2 concerns, and then, of course, the committee has always  
3 tried to be active in outside meetings such as the Technical  
4 Review Board and the academies on this topic, as especially  
5 the academies have done a tremendous amount of work in  
6 trying to define and give body and substance to the issue of  
7 risk, including risk communication.

8 Now, on slide four, let me turn to one of the  
9 highlights of our addressing of this issue this year.

10 We had a roundtable meeting on safety assessment  
11 and a public meeting with the stakeholders.

12 The daytime meeting was kind of set up to get into  
13 some of the issues of how the safety assessment process  
14 works. The public was involved. And then the evening  
15 meeting to allow those who perhaps could not make the  
16 daytime meeting to attend was devoted essentially  
17 exclusively to public discussion.

18 Our objectives were to enhance our ability to  
19 communicate technical issues.

20 If risk communication is fundamental in winning  
21 public confidence, then it's kind of important, it seemed to  
22 us, for the technical community to understand what it meant  
23 and whether there were some lessons to be learned in a more  
24 formal way about how to communicate the subject of risk,  
25 develop ideas about how to improve public participation in

8

1 NRC's regulatory process, and third, to clarify the roles of  
2 the ACNW and NRC, which we will come to a little later in a  
3 little more detail.

4 The participants, we were pleased to see,  
5 represented diverse points of view. They included  
6 representatives from the State of Nevada, the counties that  
7 are involved, and then a number of government institutions,  
8 as well as the American Indians, the Nevada Nuclear Waste

9 Task Force, and the Yucca Mountain Study Committee, and of  
10 course members of the public that were not necessarily  
11 affiliated with a particular group.

12 We are preparing a letter. We are hopeful of  
13 getting that letter out in the course of this meeting today  
14 and tomorrow, and we'll detail some of these things that  
15 we're sharing with you now.

16 But to give you a little heads-up on some of the  
17 observations -- and our attempt here was to be as direct as  
18 possible in communicating to you what we heard, and here are  
19 some of the observations.

20 When we talk about risk communication, what we're  
21 talking about principally is the matter of exchanging  
22 information about risk with the public, and that process is  
23 very much dependent on listening to them and creating  
24 opportunities for their participation, and they have great  
25 interest, of course, in the NRC decision-making process, how

9

1 it works and how they might contribute.

2 It was obvious that some members of the public and  
3 some stakeholders perceive risk communication as  
4 disingenuous because of a lack of real opportunity to  
5 influence NRC's options and decisions.

6 Now, as I say, what we're doing here is providing  
7 you with observations, not necessarily the committee's  
8 opinions.

9 Some members of the public, on slide seven, and  
10 some stakeholders perceive transportation, for example --  
11 this is just picking out a very specific issue -- as an  
12 afterthought rather than a well-understood component of  
13 overall safety assessment, and there is obvious a great deal  
14 of concern about transportation of high-level waste to Yucca  
15 Mountain over the operational period of the mountain, which  
16 is now talked about in kind of 24-year periods.

17 Most members of the public and some stakeholders  
18 have little or no experience with the NRC and its method of  
19 doing business.

20 They do have experience with nuclear activities  
21 but not with activities that have involved interacting with  
22 the Nuclear Regulatory Commission, and they are anxious to  
23 have a better understanding of how it works, and there  
24 appears to us to be a great opportunity.

25 Some additional and selected perceptions of some

10

1 stakeholders and members of the public are delineated on  
2 slides eight and nine.

3 NRC, they're fearful, will not be tough on the  
4 DOE. This came especially from the State and counties  
5 representatives.

6 NRC is perceived by some as having relaxed the  
7 high-level waste regulations to ensure that Yucca Mountain  
8 will comply.

9 Also, NRC has not justified its position against  
10 groundwater protection and that conflict between the Nuclear  
11 Regulatory Commission and the Environmental Protection  
12 Agency undermines public interest in the agency.

13 And then there was a lot of discussion about the  
14 decision-making process, how the reasonable assurance  
15 finding evolves, and I don't think that most of them were  
16 particularly satisfied by just referring to the regulations  
17 and generally compliance with the regulations.

18 They seemed to be looking for a clear indicator of  
19 what constitutes the conditions under which a decision is  
20 made, and that came not only from the public but from

21 representatives of the press at the meeting.

22 We're still architecting the recommendations, but  
23 to give you a little insight on what we probably will be  
24 recommending, we have summarized some of those on page 10.

25 First, to evaluate the feasibility of involving

11

1 stakeholders and interested members of the public in  
2 conducting some of the more specific activities associated  
3 with the licensing process, such as performance assessment.

4 The often-heard comment made is that the public  
5 are not just interested in reviewing and seeing what you've  
6 done and sort of passing on it, but we think that the real  
7 effective avenue of participation is to be able to be  
8 involved in scoping, setting up the conditions, and perhaps  
9 some of the assumptions underlying the analyses, such as the  
10 performance assessment.

11 Another recommendation is to establish  
12 transparency in the NRC decision-making process to  
13 facilitate public involvement, and of course, here, we need  
14 to provide some assistance in tying in the concept of risk  
15 communication and how it's used in that transparency  
16 process, and this is a logical extension of the whole  
17 concept of risk-informed, performance-based regulation.

18 That is to say, if we are transitioning to a new  
19 era of decision-making based on the risk-informed processes,  
20 we need to work especially hard to manifest what that  
21 mechanism is, and the opportunity exists, given that we are  
22 making changes and we are writing new regulations,  
23 especially in the case of Yucca Mountain -- we have an  
24 opportunity to demonstrate what that process is.

25 NRC should take the lead in clarifying the role of

12

1 various agencies involved in transportation of high-level  
2 waste.

3 This keeps coming up because there are so many  
4 agencies involved -- Transportation, the DOE, the NRC, the  
5 EPA -- that the public is a bit confused on who really is in  
6 charge here when it comes to convincing them what the  
7 transportation risk is.

8 Transportation seemed to be something that they  
9 really latched onto, because it was almost a personal thing  
10 in the sense that many of the local people feel they are  
11 directly involved in that, given that so much of the  
12 transportation will be through their neighborhoods.

13 So, that's we have to say at the moment on risk  
14 communication. It will come up in the context of some of  
15 the other presentations, but if there are any questions  
16 before we move to the next --

17 CHAIRMAN MESERVE: Thank you very much, Dr.  
18 Garrick.

19 This is -- risk communication is obviously an  
20 enormously important subject for us, as it cuts across the  
21 entirety of our activities, and it's an area which I'm sure  
22 we need to work on, and we very much weigh your considered  
23 recommendations.

24 I appreciate that you've tried to give us a  
25 glimpse of what's coming.

13

1 I would be interested in knowing whether you have  
2 some specific points that you would like to make with us as  
3 to how we could be more transparent in our decision-making.

4 Obviously we try to do things in the public and  
5 with Federal Register notices and using processes that are

6 really quite standard in the Federal Government, and I  
7 recognize that they may not be understood in other areas,  
8 and exactly how one might participate and how the decisions  
9 are made may not be understood.

10 Do you have any suggestions as to things we might  
11 do different that are more concrete?

12 DR. GARRICK: Well, some thoughts on it.

13 One of the things that -- when you start getting  
14 questions on decision-making and you try to reduce it to  
15 fundamentals, most people that are the point of a decision  
16 like to have alternatives.

17 They like to be able to be presented with  
18 different alternatives to address a specific problem, and  
19 they also like to understand what the measures are for each  
20 of the -- for these alternatives and that those measures  
21 should be a consistent set, and usually there is some  
22 variation on the three fundamental attributes of risk, cost,  
23 and benefits, and so, I think that, when I talk to people,  
24 what they're looking for is, well, what alternatives do we  
25 have and what attributes did they assign as a basis for

14

1 decision-making and what was the form of the results for  
2 each of those attributes?

3 Now, you're caught in a position here of being  
4 quite far downstream in the decision-making process, and so,  
5 you have to accommodate that, but I think that they have  
6 questions about, well, is risk assessment a decision  
7 analysis and, if so, how was it performed, and of course,  
8 our general observations to them on this is that a risk  
9 assessment is an important component of a decision analysis  
10 but usually a decision analysis involves other issues having  
11 to do with such things as costs and benefits.

12 On the other hand, even there, the principles of  
13 risk assessment have elevated the quality of the decision  
14 analysis considerably, especially in the area of how you  
15 address such things as uncertainty, and there is uncertainty  
16 in costs and there is uncertainty in benefits and what have  
17 you.

18 So, the whole notion of performance assessment, as  
19 it's called in the waste field -- the whole notion of risk  
20 assessment and what it can contribute to the decision-making  
21 process is rather substantial, but we do try to draw a  
22 distinction between a decision analysis and a risk  
23 assessment, and I think those are some of the things that  
24 could put it on a more definitive basis, and we realize that  
25 the regulations bound what can be done, but we also realize

15

1 that the NRC is in a position to bring into the  
2 decision-making process things like cost-benefit and issues  
3 beyond what one might normally associate with the results of  
4 a performance assessment.

5 CHAIRMAN MESERVE: Thank you.

6 Let me turn to my fellow Commissioners and see if  
7 they have any questions.

8 COMMISSIONER DICUS: Thank you.

9 I'd like to bring up one thing.

10 The findings that you had from some of your public  
11 meetings with stakeholders -- now, are these from meetings  
12 you had in '98 or '99?

13 DR. GARRICK: Oh, I should have made that a little  
14 clearer. Actually, it's both, but most of this is from the  
15 '99.

16 COMMISSIONER DICUS: Okay. When did you meet in  
17 '99?

18 DR. GARRICK: Was it October? Yes, it was in  
19 October of this year.

20 COMMISSIONER DICUS: I'm curious about that, and  
21 what I'm going to bring into this is this risk communication  
22 but, more importantly, how we communicate with the public  
23 and how the public sees the NRC.

24 I had the opportunity in April -- I spent a day --  
25 I went out to Yucca Mountain, toured it. I spent a day and

16

1 made it aware I'd meet with anyone who wanted to meet with  
2 me, and we spent a day. We started about 8:30 in the  
3 morning to about 5:30 in the meeting.

4 DR. GARRICK: By the way, we heard about that.

5 COMMISSIONER DICUS: It was a good meeting. I  
6 meet with State and local officials. I met with public  
7 interest groups. I met with Native American tribes, anyone.  
8 I met with the press, which is unusual. I usually don't do  
9 that.

10 And I learned the same things you learned. I  
11 learned some things beyond that.

12 I learned that the public didn't quite know how to  
13 deal -- how could they be part of the process. They didn't  
14 know who we were. We weren't communicating who we were. We  
15 weren't telling people -- we were not DOE. Some felt we  
16 were actually part of DOE.

17 And so, I came back and I met with the staff, and  
18 I've told them what I had learned. I had a lot of people of  
19 the staff with our Yucca Mountain group with me, so they  
20 heard the same things I heard.

21 And we talked about it, and changes were made in  
22 how we're going to communicate with the public and some of  
23 the things that we were doing that maybe were not as  
24 effective as they should have been, and we had a series of  
25 meetings with the public in the summer, and my feedback was

17

1 things had changed, we were communicating better.

2 So, that's why I bring up the question. If you  
3 met in October and you had these findings, where are we in  
4 getting this change-around, because I think we're doing a  
5 better job of communicating.

6 DR. GARRICK: Well I think you're absolutely  
7 correct, and I think that, in talking to the staff and in  
8 their public meetings, they had similarly positive  
9 experiences, and I think the number one issue here is the  
10 public would like to see a much stronger presence of the  
11 NRC, because they really don't know the agency.

12 COMMISSIONER DICUS: And I think that's what we're  
13 trying to do.

14 DR. GARRICK: Right. And I think that, in '99, we  
15 probably made our first real attempts to expose them to the  
16 agency and its advisory process, and I don't see anything but  
17 positives that have come out of that, and I think that your  
18 meeting, the staff's meetings, coming before our meeting,  
19 and ours from last year, were all building blocks, and they  
20 just want -- some of these observations, they just want to  
21 make sure that they got out and that they weren't forgotten,  
22 because they were extremely appreciative that we didn't  
23 forget them.

24 Most of the people that were in our meeting were  
25 also in our 1998 meeting, and they thought, I'm sure, that

18

1 we might just forget about it, but the fact that we came  
2 back and the fact that we tried to respond and show

3 continuity between the two meetings seemed to be very  
4 appreciated, and we plan to go back.

5 COMMISSIONER DICUS: I think that's extremely  
6 important and we keep this message going forward, because  
7 it's clear that -- the point is not to try to,  
8 quote/unquote, "win people over." The point is be sure they  
9 understand the role, understand who we are, and understand  
10 they do have a part in the process and know how to  
11 participate in that process.

12 Mr. Chairman, if I could just ask one more quick  
13 question -- I have two or three, but let me stop at this,  
14 and we can come back if there's additional time.

15 You say the NRC should take lead in clarifying the  
16 role of various agencies involved in transportation of  
17 high-level waste, but clearly the lead agency is DOT. So,  
18 how are you dealing with DOT on this?

19 DR. GARRICK: Well, this is a continuing subject  
20 of some confusion.

21 It's true that the NRC's role is principally with  
22 respect to the shipping cask and the certification of those  
23 casks and that DOT's role is principally with the  
24 transportation issues, but our understanding is that, as far  
25 as the -- taking over the waste at the reactor site, once

19

1 it's taken over, that DOE becomes responsible as far as safe  
2 delivery of that waste, and so, I think the fact that we  
3 have had to discuss this issue of who's in charge -- and it  
4 seems to be different for WIPP, for example, in New Mexico  
5 than what we're hearing it is for Yucca Mountain, and I  
6 think this is still kind of an open question, but our  
7 discussions of late on this have led us to believe that, as  
8 far as safety of the process of moving the fuel, that's a  
9 DOE responsibility in terms of making sure that the DOT, the  
10 NRC, and all other requirements are met.

11 But as far as the safety of the process, we have  
12 been recently led to believe that it's principally in the  
13 hands of the Department of Energy

14 So, I think just the very fact that there's some  
15 question about that is another opportunity for us to provide  
16 clarification on just exactly --

17 COMMISSIONER DICUS: So, do we have a pathway to  
18 go forward on that?

19 DR. GARRICK: Yes.

20 COMMISSIONER DICUS: I mean the transportation, I  
21 think we might all agree, is not really necessarily a public  
22 health and safety issue, but it is a public policy issue,  
23 and we do need to address it.

24 DR. GARRICK: Yes. And the public does not seem  
25 to be aware of the extensive amount of work that's been done

20

1 on such things as the testing of fuel casks and the Sandia  
2 experiments of years ago, when they crashed these things  
3 into walls and 70-mile-an-hour trains and what have you.

4 So, there seems to be a real gap here of  
5 understanding the difference between death that might come  
6 from an accident, a truck or automobile accident, and deaths  
7 that might come or injuries that might come from  
8 radiological effects, and I think we really need to do some  
9 work there.

10 CHAIRMAN MESERVE: Commissioner Diaz, do you have  
11 any questions?

12 COMMISSIONER DIAZ: Yes.

13 I have been very pleased seeing that you are  
14 casting risk a tripod of assessment, communication, and



15 management, because I think that's a very important issue,  
16 and you have spent now one year in an effort of trying to  
17 communicate risk? Is that correct?

18 DR. GARRICK: Well, I've spent a lot more than one  
19 year.

20 COMMISSIONER DIAZ: I know you have. I think that  
21 is a fascinating issue, and I was wondering if you could  
22 define for us, when you are trying to portray how you would  
23 be able to accept a risk, how do you define risk?

24 DR. GARRICK: Well, it's interesting you'd ask. I  
25 was delighted to see the Commission white paper of a couple

21

1 of years ago adopt what we refer to in the business as the  
2 triplet definition of risk.

3 When you ask the question, what is the risk,  
4 you're really asking three questions in the judgement of  
5 those who have accepted the triplet, and that is what can go  
6 wrong, how likely is it, and what are the consequences, and  
7 we've been very encouraged by the results of adopting that  
8 point of view of what we mean by risk, because we answer the  
9 question of what can go wrong in the context of a structured  
10 set of scenarios, and of course, the consequences question  
11 is something this agency has a lot of experience with, what  
12 are the end states of these scenarios, and usually what  
13 happens there is you decide on what those are and then you  
14 look for scenarios that can get you to those end states.

15 In the reactor field, an end state might be core  
16 melt or it might be a release fraction of a certain mix of  
17 fission products, or it might be dose, or it might even be  
18 health effects, but the point being is that it's not -- it's  
19 important to define what the end state is or what the risk  
20 measure is and then deal with the question of how can you  
21 get there, and then, of course, you have to look at whatever  
22 supporting evidence that's available to you to deal with the  
23 question of likelihood, and the important thing to recognize  
24 in that part of the question is that there's uncertainty,  
25 and you've got two choices with uncertainty.

22

1 One is you can ignore it, which unfortunately is  
2 often done, or you can embrace it as best you can and  
3 recognize that the uncertainties have to be supported by  
4 whatever evidence you can develop, but if you don't have  
5 much evidence, then your uncertainty curves are very broad,  
6 but that communicates a very important aspect of risk,  
7 because in the minds of many, the uncertainty is the risk.

8 COMMISSIONER DIAZ: That brings up -- you know,  
9 the immediate point is that, when you're trying to  
10 communicate risk -- at least my own experience is, when you  
11 start talking about probabilities, consequences, and  
12 uncertainties, you immediately get glazy eyes.

13 People want something that is more precise and  
14 more specific, and you know, once you start, you know, going  
15 in what we will call a very complete scientific analysis or  
16 definition, the immediate question is what does it mean to  
17 me, and my question is have we made progress to answer that  
18 question, what does it mean to me?

19 DR. GARRICK: I think it will take time. I  
20 suspect, when pressure parameters involving pounds per  
21 square inch first came out, that it was an abstract concept  
22 for many, or miles per hour, or any of these parameters, and  
23 I think, with usage, that the notion of expressing things in  
24 terms of probabilities will become more comfortable.

25 I think it's a convenient issue to pick on by

1 people who do not support the quantification movement, but I  
2 just have confidence that, with time -- and it will take  
3 time -- it will be increasingly accepted.

4 I don't think there's anything that will do it  
5 except experience with it.

6 DR. HORNBERGER: The Weather Channel is going to  
7 help us, because people are understanding, when they say a  
8 10-percent chance of rain, as to whether they really want to  
9 carry their umbrella or not.

10 COMMISSIONER DIAZ: All right. Thank you.

11 CHAIRMAN MESERVE: Commissioner McGaffigan.

12 COMMISSIONER MCGAFFIGAN: You referred to the WIPP  
13 experience, and from one of your draft observations, NRC  
14 lacks a clear bottom line and basis for decision-making,  
15 would the public in New Mexico have said the same thing  
16 about EPA when it was dealing with whether it would certify  
17 WIPP?

18 DR. GARRICK: Well, early in the time of the WIPP  
19 performance assessment work, they were clearly saying the  
20 same thing, and I think that the performance assessment was  
21 relatively unscrutable or inscrutable during its early  
22 drafts, and I think that there was a lot of confusion.

23 The technical community was a bit unhappy with the  
24 40 CFR 191 and the released table -- released fraction  
25 tables associated with that regulation, partly because it

24

1 was not so much a real measure of risk, or putting it  
2 another way, the risk measure was based on release  
3 fractions, not on health effect or dose or something more  
4 directly translatable.

5 So, I think they went through the same process.

6 COMMISSIONER MCGAFFIGAN: Did they ever succeed?  
7 How important was this Environmental Evaluation Group that  
8 New Mexico had?

9 DR. GARRICK: I think it was very important.

10 I think that they -- and it's regrettable, in my  
11 opinion, that there's no real effective counterpart to that  
12 in connection with Yucca Mountain, because these people,  
13 while they were extremely critical and raised very difficult  
14 issues, they were also scientists and engineers that  
15 attempted to understand the technical merits of the issue,  
16 and I think it was a tremendous bridge-gapper between the  
17 regulator and the licensee in this case in terms of gaining  
18 understanding of what was taking place, and they had an  
19 enormous impact.

20 COMMISSIONER MCGAFFIGAN: For my fellow  
21 Commissioners, the Environmental Evaluation Group, my  
22 recollection, was created in '81 or '82, very, very early in  
23 the process, as part of a settlement between the State, I  
24 think then-Attorney General Bingaman was part of, and the  
25 DOE, and it was there for that entire 17-year period between

25

1 '81 and '98 while DOE worked on things, it's been,  
2 particularly for the last seven years, when EPA had a  
3 clearly established role as the party, and it does strike  
4 me, oftentimes, as we deal with Nevada, that the equivalent  
5 to the Environmental Evaluation Group, you know, isn't  
6 there.

7 It was funded by DOE. It was based at a  
8 university initially, at New Mexico Institute of Mining  
9 Technology, and had competent scientists there who spoke the  
10 same language, and they, in turn, struggled at risk  
11 communication with the broader public. So, they almost had

12 a shared issue.  
13 DR. GARRICK: Exactly.  
14 COMMISSIONER MCGAFFIGAN: So, I think that would  
15 help if Nevada would consider that.  
16 But in terms of bottom line, in some sense, our  
17 Part 63 is an expression of our bottom line. Is this  
18 observation that they don't like our Part 63 which comes  
19 across in others, the 25 millirems, all pathway, 10,000 year  
20 -- over the first 10,000 years of the repository's  
21 existence, or is it something else?  
22 DR. GARRICK: Well, I don't know that you could  
23 say they don't like 63. Sixty-three has some changes in it  
24 that are really fundamental as far as the regulatory process  
25 is concerned. Maybe most notably is the elimination of the

26

1 sub-system requirements.  
2 And I think inherent in human nature is that, when  
3 you make changes of such a fundamental nature, you know,  
4 there is some concern that you're possibly removing some  
5 protection, but I also see in the public comments the other  
6 view, that it's very much a move in the right direction,  
7 that it's less dependent on surrogate measures of risk, it's  
8 more focused on bottom-line issues having to do with safety  
9 and risk.  
10 COMMISSIONER MCGAFFIGAN: The Nevada public may  
11 not be giving us a lot of comments.

12 DR. GARRICK: Right.  
13 COMMISSIONER MCGAFFIGAN: There's one other issue  
14 -- in terms of how we're going to communicate and how the  
15 Commission performs -- and we may well look at it -- we've  
16 said we're going to look at it, but when the license  
17 application comes in, if it comes in, in 2002, we get into a  
18 very different mode of communicating with the public, just  
19 as Calvert Cliffs -- I have met with the Calvert Cliffs  
20 licensee for a long time, because there's a pending  
21 proceeding or whatever.

22 If there is a pending proceeding and there are  
23 parties and people have standing and all that, then we, the  
24 five of us, get quite removed.  
25 The staff can continue to have public meetings.

27

1 With PFS in Utah at the moment, the staff has a  
2 large number of public meetings, but Commissioners -- I  
3 think SECY has a standard letter, you know, the  
4 Commissioners appreciate your views, I've shared it with all  
5 of them, it's in the file, but you can understand why they  
6 aren't going to respond, because this is a matter pending  
7 before the Commission.

8 So, we get quite distant at that point, and that  
9 may be an impediment to communication at a critical time. I  
10 don't know what the answer is.

11 You will be able to communicate, the staff will  
12 still be able to communicate, but we're going to have to be,  
13 with our judicial robes on, more sphinx-like during a fairly  
14 critical time period.

15 DR. GARRICK: Maybe that's an additional  
16 opportunity for the advisory committees.

17 COMMISSIONER MCGAFFIGAN: It wasn't the case with  
18 WIPP, because EPA doesn't have a formal adjudicatory hearing  
19 process.

20 DR. GARRICK: Right.

21 COMMISSIONER MCGAFFIGAN: They had numerous public  
22 meetings, including some that very high-level officials

23 attended in New Mexico, but they weren't hearings, and so,  
24 there's a question in my mind as to whether you get more  
25 public confidence through something less formal than you do

28

1 through something as formal as we've chosen to do over the  
2 years.

3 CHAIRMAN MESERVE: Commissioner Merrifield?

4 COMMISSIONER MERRIFIELD: Thank you.

5 Former Chairman Dicus, Commissioner Dicus, had  
6 raised an issue relative to transportation casks and some of  
7 the information currently out there on that, and there has  
8 been a lot of rhetoric thrown around about mobile Chernobyls  
9 and the dangers associated with those casks.

10 When one talks about public communication -- you  
11 mentioned some of the films that are out there, some of the  
12 research that's been done -- I've seen some of those films  
13 -- and our ability to communicate our thoughts about those  
14 casks and their safety, it raises an issue and a tension  
15 that we've had in the 25 years since we became the Nuclear  
16 Regulatory Commission, and that is the tension between our  
17 providing information to the public and being promotional,  
18 and I think there has been some reservation on the part of  
19 staff and previous commissions to provide a greater level of  
20 information about some of these issues for fear that we  
21 would be cast in the light of being promotional, and so, as  
22 it relates to an example such as this, how can we -- have  
23 you thought -- how can we better serve the public by  
24 providing more information, whether it's the films, whether  
25 it's detail, whether it's our response to how safe those

29

1 casks are, without compromising the need for ourselves not  
2 to be promotional?

3 How do we get that balance and provide greater  
4 information and, to some degree, comfort to people who have  
5 fears about the use of these casks or other issues  
6 associated with Yucca Mountain.

7 DR. GARRICK: Well, I'm not sure I have an answer,  
8 but if I were sitting in the position of being the  
9 regulator, I guess the way I would attempt to address it  
10 would be to, during the licensing process, be darn sure that  
11 the case for transportation was visible and an important  
12 part of that application.

13 I think, if there's one issue we ought to be able  
14 to do a very thorough and comprehensive analysis of, it's  
15 transportation risk, and I think the burden for doing that  
16 ought to be on the applicant.

17 So, at least one approach here would be to make  
18 darn sure that the applicant does that.

19 Now, I don't think this is the kind of thing  
20 that's going to require long periods of time and extensive  
21 research and analysis.

22 I think it's more a matter of taking what we know,  
23 the experience we have -- we're much more advanced now in  
24 the analytical process on characterizing the risk of systems  
25 than we've ever been before, and bringing it together in the

30

1 context of a risk analysis that's compatible with the way in  
2 which they're doing their performance assessment.

3 So, I think, from NRC's perspective -- I'm not a  
4 regulatory expert, but it's more a matter of being satisfied  
5 that the license has done the job that the NRC thinks is  
6 required to enhance public confidence and understanding.

7 It just strikes me that this an issue that is out  
8 of control and absolutely unnecessary, because this not one

9 where we don't have technologies, we don't have information.  
10 We have a tremendous amount of information, but we've just  
11 not put the story together in a way that allows the public  
12 to distinguish between routine transportation accidents and  
13 fatalities and the shipment of fuel and the associated  
14 radiological risk associated with it.

15 COMMISSIONER MERRIFIELD: You sort of go both ways  
16 on that.

17 In part, you're saying we ought to require that  
18 the applicant provide sufficient information to demonstrate  
19 all these things, but at the same time, you seem to be  
20 saying but there's still a need out there -- we have a lot  
21 of information that's available, we need to make that more  
22 readily available.

23 Is there a mechanism or a way in which we can say,  
24 okay, this is what we know about cask designs, this is how  
25 we would evaluate the cask, this is what we know about

31

1 transportation issues, this is how we would evaluate them?

2 Is there a better way for us to articulate the  
3 thought processes -- you talk about transparency -- the  
4 thought processes that we're going to through in evaluating  
5 that and making sure that they're safe?

6 DR. GARRICK: Well, I think there surely must be.

7 I happen to be a believer in the white paper  
8 concept. I think it would not be inappropriate for the  
9 Commission to say to its advisory committees give us some  
10 thought about this subject and perhaps it could be a  
11 candidate for preparing something like has been prepared by  
12 this committee in the past on selective topics, and the  
13 ACRS, as well.

14 So, I think that there's probably some things that  
15 could be done by the NRC that would better prepare them for  
16 addressing it in the license application that would begin to  
17 pull these pieces and parts together.

18 That's partly why, if we get to it, that's partly  
19 why we poked our nose into the design arena and wrote a  
20 white paper by our former member on the matter of repository  
21 design, because we think that it's very important, in order  
22 to ask the right questions, to stretch our limits of  
23 understanding of what's going on way beyond what we expect  
24 will probably be in the application.

25 CHAIRMAN MESERVE: We do need to move on to

32

1 another subject. Commissioner Diaz has assured me he has a  
2 very short question, and I'll hold him to that.

3 DR. GARRICK: It's a question of whether I have a  
4 short answer.

5 CHAIRMAN MESERVE: And I'll hold you to one.

6 COMMISSIONER DIAZ: Same issue. You know, we  
7 realize that this is a multi-layer system from the  
8 scientific issues to the technical issues and how you  
9 communicate risk, and we're all very aware of the  
10 disclaimers that are put every time something is finished,  
11 like you know, this is our conclusions, however additional  
12 work is needed to narrow down the uncertainties, and when  
13 you put that disclaimer in, you know, you throw the whole  
14 ball of wax.

15 My question is have you been able to gauge the  
16 importance of credible and accountable convergence and  
17 simplification of scientific and technical facts prior to  
18 the time that you disclose that you actually, you know, do  
19 your risk communication?

20 How important is a credible and accountable  
21 process of simplifying convergence so you will not have that  
22 many disclaimers, you will not have that many issues, which  
23 essentially reopen the issue?  
24 DR. GARRICK: Well, I will try to give a short  
25 response to that.

33

1 I think part of what you're asking, Commissioner  
2 Diaz, is -- has to do with how you present the evidence that  
3 supports your analysis, and I think there is a lot more  
4 creative opportunities there than sometimes we employ in how  
5 we present the supporting information for our analysis, and  
6 this is why I really like uncertainty analysis, because if  
7 you admit to the uncertainty and present your state of  
8 knowledge in your parameter measurements, then you have a  
9 basis to say, okay, here is my supporting evidence and this  
10 is why those curves have the shape that they have, and I  
11 think there's got to be a better connection between the  
12 results we present and the supporting evidence, and that we  
13 just have to keep working on.

14 COMMISSIONER DIAZ: Okay. Thank you.

15 COMMISSIONER MCGAFFIGAN: Just very briefly, this  
16 follows up Commissioner Merrifield and Commissioner Dicus.

17 Yesterday you got briefed by DOE, or the day  
18 before, on their DEIS, and one of the issues is, of course,  
19 transportation, and they present an analysis for the mostly  
20 truck case, the mostly rail case, with statistics that would  
21 lead one to believe this is not a big issue.

22 It's not dissimilar from the Part 51 rule-making  
23 we did earlier this year, where NRR, for the purposes of  
24 license renewal, had to look at transportation in the  
25 vicinity of Yucca Mountain and it had very, very

34

1 conservative analysis, really piling conservative assumption  
2 on conservative assumption, not the sort of thing you  
3 generally like, but it still found very low numbers in terms  
4 of latent cancer fatalities for any member of the public.

5 Is there something wrong with the way both we and  
6 DOE, when we're doing our EIS's, are presenting this? What  
7 are you looking for in the way of improved risk  
8 communication?

9 In some sense, DOE is trying to justify the  
10 transportation case right now in its draft EIS, and I'd be  
11 interested in whether you had any comments on how they could  
12 make that -- what they need to do to improve that case, what  
13 comments we maybe should make to them as to how they should  
14 improve that case.

15 DR. GARRICK: I think there's a couple of  
16 questions here.

17 One is the believability of the results by the  
18 public, and again, I say the answer to that is the same one  
19 I gave to Commissioner Diaz, and that is that I think part  
20 of our problem in getting the public to believe our results  
21 is the abstractness of our analyses.

22 They're very esoteric, they're very difficult to  
23 comprehend, and where we can improve things is to tighten  
24 the connection between the results we have and the  
25 supporting information.

35

1 Now, yesterday, when we heard all of this, it  
2 prompted a lot of the kind of questions you're asking, and  
3 we haven't had a chance to look in the details nearly as  
4 much as we'd like, questions about, well, how did you factor  
5 into your analysis the details of the integrity of the cask

6 and what kind of basis did you use to decide what the impact  
7 forces were and so on and so forth, and it's going to  
8 require a little more digging than we've had an opportunity  
9 for us to establish a connection between what they, in fact,  
10 did, and what can be supported by the information base.

11 I really believe that the answer is in the  
12 evidence package, how you put the story together to support  
13 your analyses, and that's difficult to do, but where it's  
14 been done, it's been very effective.

15 COMMISSIONER MCGAFFIGAN: My only comment is I  
16 know that the people of New Mexico, dealing with the WIPP  
17 containers and the WIPP transportation routes, you know, to  
18 this day continue to raise issues, because it tends to be  
19 bumper-sticker sort of stuff.

20 I mean I think that the EPA and the DOE and most  
21 of the folks don't believe there's a big issue there anymore  
22 and a lot of money is going to flow to improve local fire  
23 departments and that sort of thing, but -- so, partly,  
24 again, going back to the WIPP example, this is still not a  
25 fully resolved issue in the case of WIPP.

36

1 DR. GARRICK: That's right.

2 COMMISSIONER MCGAFFIGAN: Yet, most people don't  
3 -- including the Environmental Evaluation Group, I think --  
4 don't think there's a big transportation issue here.

5 DR. GARRICK: That's why it's all the more  
6 important to deal with it in a convincing and reasonably  
7 coped fashion, because the evidence is pretty strong that  
8 it's not a big issue, and yet, in the minds of the public,  
9 it's perhaps the biggest issue, especially during the  
10 operating phase.

11 CHAIRMAN MESERVE: I think that the extent of the  
12 questions reflected both the importance of the general  
13 subject and the interest, in particular, in its application  
14 to Yucca Mountain. Why don't we proceed?

15 DR. GARRICK: Okay.

16 One thing I did want to say -- as you know, the  
17 committee is only 75-percent complete right now, and so,  
18 what we've done to help us is bring in a consultant to work  
19 with us in a few meetings, and in order to make the  
20 consultant feel very comfortable -- and he's not on next --  
21 we've given him one of the toughest subjects to talk about,  
22 Part 63, and he'll have a chance to do that in a little  
23 while, but first George.

24 DR. HORNBERGER: Thanks.

25 My topic, as you know, is to discuss with you a

37

1 little bit the white paper and the cover letter that the  
2 ACNW sent.

3 The white paper was prepared by our former member,  
4 Charles Fairhurst, and I guess, of our presentations, this  
5 is the only one that you already have in hand. Everything  
6 else is a work in progress.

7 Just as a little background, we have had an  
8 interest -- and this was enhanced when Charles joined the  
9 ACNW -- we have had an interest in engineering aspects of  
10 the repository.

11 It's our perception, was our perception starting  
12 even several years ago, that it's a geological repository.  
13 There was an awful lot of emphasis put on natural processes,  
14 geological aspects, site characterization, but in moving  
15 forward, it was pretty clear that DOE was focusing evermore  
16 on design aspects of the repository, and we thought that it

17 was incumbent on NRC staff and on us to really keep up to  
18 date on what was going on, and Charles, in particular, had a  
19 very strong interest in the engineering aspects, and  
20 therefore, we thought that it would be a good opportunity  
21 for him to prepare a white paper that would certainly  
22 educate us and raise the level of our discussion on  
23 engineering aspects and provide some useful information to  
24 NRC staff, as well as others outside the NRC.

25 The point of the white paper, looking at page 12,

38

1 that slide, is that -- the whole issue is that there might  
2 be innovative engineering designs that would lead to two  
3 things: first of all, enhanced safety and, second of all,  
4 reduced costs.

5 This is the best applications of engineering  
6 analysis, and the intent of Charles' white paper wasn't to  
7 promote a specific design but, rather, to just stimulate  
8 thinking.

9 The next slide, on page 13 -- this is the piece de  
10 resistance of my presentation.

11 My colleague, Ray Wymer, told me this was a  
12 terrible slide and that it was a typical engineering slide  
13 with no title, with little dots, it was obscure, and I was  
14 warned that I would get bogged down for 10 minutes trying to  
15 explain this.

16 Nevertheless, pushing right on, this is just an  
17 illustration of one of the analyses that Charles undertook,  
18 just as an example.

19 Again, I stress it's just an example, and the  
20 issue is that, in looking at the performance assessments  
21 that are done for Yucca Mountain, it is clear that water  
22 contacting the waste is really important, and anything that  
23 can be done to avoid water contacting the waste package  
24 could lead to very significant improvements, and so, Charles  
25 was thinking, well, isn't there some way that we could use

39

1 aspects of the natural system to our advantage, and so, one  
2 of the things that this show is a three-level repository --  
3 that's what those little dots are.

4 They're drifts, and you see that one -- there are  
5 three in a line, one above the other, and at the very top,  
6 he shows a slot with what's referred to as a Richards  
7 barrier to deflect water from the general direction, and  
8 then he goes through a fairly simple analysis that shows  
9 that, particularly for the lower two drifts, the water  
10 entering the drifts is very much reduced, it essentially  
11 goes to zero, so that with -- perhaps -- I underline perhaps  
12 -- with some very modest design changes, one could reap  
13 pretty large, significant benefits in terms of safety  
14 without much at all.

15 So, on page 14, the -- to tie this together, then,  
16 in terms of the white paper, I just wanted to recall that,  
17 in the past, we have recommended to NRC staff that, because  
18 of the increasing emphasis on engineering aspects of the  
19 Yucca Mountain design, we encourage the development and  
20 enhancement, if you will, of expertise and engineering  
21 aspects of repository design and really a systems  
22 engineering approach.

23 By that, we really mean an overall, a holistic  
24 view of the Yucca Mountain as a system, and we have  
25 recommended that in several letters over the past two years,

40

1 I think, and we did visit the center this past -- I think it  
2 was June, and we held a meeting down there, and we have seen



3 that, in fact, there is a movement to really improve on the  
4 expertise available in engineering aspects.

5           The next slide -- as you will recall in the letter  
6 that we sent, we recommended that the NRC staff actually  
7 explore innovative designs for the repository, and our idea  
8 is that these could allow furtherance of the NRC mission of  
9 enabling safe and efficient use of nuclear materials, as  
10 well as to enhance the engineering capabilities of the staff  
11 in preparation for a design, and the enabling language -- I  
12 suppose, in large part, we are somewhat frustrated, as  
13 technical people tend to be when we deal with the Department  
14 of Energy and see what they're doing and say, well, we would  
15 like to advise them on what they should doing, even though  
16 that's not our job at all, and I think that, to the extent  
17 that the NRC staff, the NRC, could somehow encourage DOE to  
18 look at more innovative designs -- and of course, if NRC  
19 staff took it on themselves to do that -- that this actually  
20 might move the whole field forward, and that was the thrust  
21 of it.

22           Page 16, having said that, we fully recognized  
23 when we sent the letter forward that the most likely  
24 response would be, well, it's not NRC's job to design the  
25 repository, and we recognize that. That's straight up. We

41

1 know that it's not NRC's job to design the repository, and  
2 again, I think that our whole intent was to stimulate  
3 thinking, and it's our belief that, by looking at new ideas  
4 and looking for new ideas, that one will automatically be  
5 put in a better position to evaluate whatever does come  
6 forward.

7           Milt Levenson mentioned today that the idea can be  
8 expressed as, if you like, confirmatory engineering, in much  
9 the same way that NRC does confirmatory research, they don't  
10 do primary research for looking -- defining new things for  
11 Yucca Mountain, but they do confirmatory research, and at  
12 any rate, that's the idea that we came forward with.

13           Okay.

14           Finally, in terms of repository monitoring, we  
15 know that repository monitoring is included in Part 63, both  
16 pre-closure and post-closure, and the thrust of our  
17 recommendation here in terms of considering guidance that  
18 NRC may give to DOE on monitoring was really seconding, if  
19 you will, a USGS position that you may have seen that the  
20 ideas for monitoring have not really been expressed very  
21 clearly by DOE, they have not expended much energy on that,  
22 and we think that it is an important issue and that it's  
23 timely, that this really should be done, that the department  
24 needs to think about what both the pre-closure and the  
25 post-closure monitoring schemes will look like so that

42

1 evaluation can begin.

2           CHAIRMAN MESERVE: Thank you, Dr. Hornberger.

3           Has the ACNW forwarded the white paper to DOE, and  
4 have you had any reaction or response from them on that?

5           DR. HORNBERGER: I don't know that we officially  
6 forwarded it, but we do know that it has been seen and read,  
7 and one of the ways that we know this is that you see that  
8 Charles Fairhurst is no longer with us. He has been tempted  
9 by DOE to actually look at innovative designs. So, of  
10 course, he had to resign.

11           Has it been officially forwarded, John?

12           DR. LARKINS: No.

13           DR. HORNBERGER: No, but it's been picked up.

14 COMMISSIONER DICUS: I wonder if they've responded  
15 to it.

16 I have a couple of things, but I'm watching the  
17 time here, so let me get in the first one. If time allows,  
18 I'll get into the second one.

19 This has to do with the issue of the NRC being  
20 involved in whatever extent we do in design activities for  
21 the facility.

22 We're walking on, as you mentioned, thin ice, egg  
23 shells, however you want to place it, and I go back to the  
24 issue of public perception and how the public perceives us  
25 and DOE, and we're nudging over the line, in my view, on

43

1 this.

2 Now, I understand what you're saying. I  
3 understand that, well, we need to deal a little bit in this,  
4 in trying to put it in terms of confirmatory research, but  
5 the public will not understand that, and I'm really  
6 concerned that we're sending a dual message here, and I  
7 guess my question -- you know, we're obviously not funded to  
8 do this, it won't make a cost-effectiveness question -- is  
9 there another way for us to ensure that, should we get a  
10 license application -- and I think this is another message  
11 we need to be very clear on, because we talk so often in  
12 terms as though the decision has already been made, we will  
13 have a license application.

14 There is no decision. We don't know that we will.  
15 Let's be clear in our communications. That's another thing  
16 the public comes to us at. You talk about what you're going  
17 to do when you get the license application. We don't know  
18 that we will get one.

19 But is there another way for us to demonstrate  
20 that we do have the engineering expertise, if we get a  
21 license application, to deal with this without nudging into  
22 this field of facility design?

23 I'm worried. I think we're a little more into it  
24 than we should be.

25 I know what you're trying to do, and I appreciate

44

1 that, but I am concerned. Is there another avenue to  
2 success here?

3 DR. HORNBERGER: I'm not sure that the ACNW really  
4 thinks that the NRC should undertake -- the NRC staff should  
5 undertake a new program to really figure out what the  
6 optimal design should be.

7 I think that it was more being prepared to  
8 evaluate what might come forward as innovative designs, and  
9 in doing that, I think that the idea is that, by just  
10 thinking creatively about what such designs might look like  
11 and then being prepared to do the analysis, it's not really  
12 bringing new designs forward. I think that we're sensitive  
13 to that.

14 Part 60, of course, required alternate designs,  
15 and I think that, in draft 63, that's still carried over.  
16 Whether or not it will be in the final, I don't know, but  
17 the whole idea there, I think, is that, again, in terms of  
18 public confidence, one wants to see alternative designs, and  
19 if, in fact, there's a low-cost option that somehow adds a  
20 lot of safety, we want to make sure that the department  
21 would look at that.

22 I recognize it's a very dicey situation.

23 DR. GARRICK: Let me give another spin on this.

24 I think that one of the things we want to be very  
25 sure of, putting my public hat on, is that the NRC is

1 qualified to do the job they're asked to do.

2 We want as good a design capability, good analysis  
3 capability, as good a research capability on the things  
4 we're trying to license as we possibly can have, and a  
5 direct experience with the ACNW members is the experience we  
6 have when we come onto an issue and we make the decision  
7 that we need to burrow in on that issue more, and the way we  
8 do that is with a workshop, our working group session, and  
9 we had a working group session about the time when it was  
10 clear that it looked as though that Yucca Mountain was going  
11 to have to depend much more than anybody had envisioned on  
12 engineered systems, and so, we have a workshop on that, on  
13 multiple barriers, on engineered systems, and these  
14 workshops are the most satisfying, in many respects,  
15 activity that the advisory committee does, and it really is  
16 kind of the exciting part of our business, because it  
17 nurtures our own ability to do a better job of this, and it  
18 somewhat offers us a chance to be unbounded in our inquiries  
19 and our investigations, and it equips us, in our judgement,  
20 as George has already said, much more effectively to do our  
21 job, and that's exactly what happened here.

22 When we had the workshop, Charles Fairhurst really  
23 got stimulated about some of the design issues, and how can  
24 we make the repository less dependent upon engineered  
25 systems and take greater advantage of the natural system?

1 So, it sort of had -- and part of it's probably my  
2 fault, because I pushed Fairhurst to do a dump on us, on the  
3 committee, on matters of design, so that it could be used in  
4 this regard, but we recognize exactly what you're saying and  
5 the absolute importance of us not to send out the wrong  
6 message here, but I did want to make the point that it's  
7 these kinds of pursuits that makes, I think, the advisory  
8 committees more effective and allows us to attract the best  
9 possible people.

10 COMMISSIONER DICUS: Thank you.

11 COMMISSIONER DIAZ: My question has been answered.

12 COMMISSIONER MCGAFFIGAN: It's sort of in the same  
13 ball park, but it strikes me that it isn't as clear-cut in  
14 some respects.

15 We just happened to affirm AP-600 earlier today.  
16 There's a famous issue on which the Commission was not  
17 unanimous with regard to the additional spray system that  
18 your fellow advisory committee, ACRS, ultimately advised us  
19 to go along with the staff and add.

20 Is that adding a safety feature -- it was added  
21 for severe management issues. It was the strongly-held view  
22 of the staff. As I said, ACRS, because of uncertainty, on  
23 balance, said, you know, let's do it. It was not very  
24 high-cost.

25 But we added a design feature to the AP-600 as a

1 result of the review process.

2 So, the question is really, you know, if we get an  
3 application -- and I don't know what a Richards barrier is  
4 -- I saw the chart, but -- and say it isn't in there and the  
5 staff asks DOE a question, you know, would safety been  
6 enhanced by having a Richards barrier and DOE hems and haws  
7 and the staff, over time, convinces itself it really would  
8 be better and we put in a license condition that says you do  
9 -- ultimately the staff proposes and we ratify through the  
10 adjudicatory process -- this is all hypothetical -- then

11 we've changed the design by adding an additional safety  
12 feature, but it is not without precedent, and I'm sure  
13 Commissioner Diaz would say unhappy precedent.

14 COMMISSIONER DIAZ: In case you don't know, I am  
15 totally opposed to adding a system that is not  
16 safety-related to fulfill a safety function on the passive  
17 system.

18 COMMISSIONER MCGAFFIGAN: Okay.

19 I'm not sure it's as cut and dried, because in  
20 reviewing an application and asking questions and thinking  
21 about -- clearly, in reactor space, we have said we'll  
22 approve it subject to the following conditions, and those  
23 conditions involve a design change.

24 So, I'm not sure -- we shouldn't be designing the  
25 repository, but we should be in a position, as I think you

48

1 all are saying, our staff should be asked hard questions  
2 about the design and asked questions, you know, would there  
3 be a benefit to a delta here and put the applicant through  
4 -- if there is an application -- through their paces as to  
5 whether that additional safety feature, that additional use  
6 of the mountain would provide a substantial increase in  
7 safety or not.

8 I think it's a path we have to walk, but it's  
9 maybe not quite as clear-cut, because we do get involved in  
10 the design issues in the license space.

11 CHAIRMAN MESERVE: Commissioner Merrifield.

12 COMMISSIONER MERRIFIELD: Two quick questions.

13 How do we -- given the presentation on the  
14 Richards barrier and these issues, you raise the notion that  
15 we need to keep considering some alternative theories out  
16 there.

17 How do you reconcile that with the need to try to  
18 get DOE to finalize a design so that we can move forward  
19 with the work that we need to do? I mean those seem to be  
20 two very different criteria.

21 DR. HORNBERGER: Yes. To a certain extent, they  
22 are, and I think our advice would, in fact -- we're always  
23 leery of the idea of finalizing a design and casting it in  
24 concrete and saying it shall evermore be thus.

25 At the same time, we recognize that the staff

49

1 faces this huge problem of analyzing the design du jour, and  
2 you have to get away from that.

3 I don't know how you resolve that, but I do think  
4 that maintaining flexibility is extraordinarily important,  
5 because it's clear, I think, to everyone that what we know  
6 10 years from now is going to be different from what we know  
7 today, and we simply have to be prepared to accept changes  
8 as one goes.

9 COMMISSIONER MCGAFFIGAN: That's fair enough.

10 My associated question is this: We rely quite  
11 heavily on the Center for Nuclear Waste Regulatory Analysis  
12 to do a lot of that work for us. I had an opportunity to  
13 visit there earlier this year, and I've said very  
14 complimentary things about what I refer to as our NRC  
15 extended family down there.

16 Are we looking at the right things there? Are we  
17 committing the right level of resources to that facility to  
18 do the kind of work that you're talking about?

19 DR. GARRICK: Good question.

20 DR. HORNBERGER: Oh. Well, you answer it.

21 CHAIRMAN MESERVE: You may want to consider that  
22 before answering.

23 DR. HORNBERGER: It's certainly something that we  
24 have considered over the years.

25 As I said, we held a meeting down at the center.

50

1 We have looked pretty carefully at their whole program, and  
2 we have expressed our ideas on how they might set their  
3 priorities by looking at the performance assessments and  
4 doing things that way.

5 I would say that -- my personal opinion from our  
6 latest visit and from other visits down there is that we are  
7 all quite impressed with the quality of work being done,  
8 that the people are not only doing good work but that they  
9 are approaching the work that they're doing in a structured  
10 way and that they really are doing the important things.

11 The question of level of resources needs some more  
12 consideration, I think.

13 COMMISSIONER MERRIFIELD: You've answered the most  
14 significant part of the question I wanted, so we can leave  
15 it at that.

16 CHAIRMAN MESERVE: Why don't we proceed?

17 DR. GARRICK: Okay.

18 Mr. Levenson.

19 MR. LEVENSON: Thank you, John, including the  
20 introduction that told me why you asked me to speak here, so  
21 you could avoid the tough questions.

22 I am not a member of the committee. I have read  
23 the ACNW letters on the topics I will cover, but I did not  
24 participate in the discussions leading up to those letters,  
25 and as a result, some of my comments and responses to

51

1 questions really should be considered as my opinions, not  
2 necessarily those of the ACNW.

3 The two areas I've been asked to address is the  
4 EPA high-level waste standard issue and the technical issues  
5 regarding 10 CFR Part 63.

6 My perception is that Part 63 is not just an  
7 update on the regulations. I think it's very special in  
8 that it represents a transition from prescriptive regulation  
9 to risk-informed, performance-based regulation, and  
10 therefore, it needs to be viewed a little differently than  
11 just another regulation.

12 On slide 20, from reading the letters, I observed  
13 that the ACNW concurs with the staff's comments on Part 197  
14 and in the past has supported the 25-MR all-pathways  
15 standard, and I personally concur with that, too.

16 The next bullet is a little different matter. The  
17 overly restrictive standards, if accepted, become the norm,  
18 and I think that's very important, and the wording of that  
19 bullet is very specific to the second point I want to make.

20 I have not said overly conservative standards.  
21 I've said overly restrictive, because it's my personal  
22 opinion that overly restrictive standards are almost never  
23 conservative.

24 If you are overly restrictive and you can't do  
25 that consistently, you distort what are the real risks.

52

1 Something that is of relatively low risk gets distorted into  
2 high risk. You divert resources to address that, and  
3 something that isn't nearly so important rises up and  
4 catches the attention. I think it's extremely important to  
5 recognize that overly restrictive is very seldom  
6 conservative.

7 Once accepted -- I can give a specific example.

8 For instance, like John, I've been involved with WIPP. An  
9 over-restrictive estimate of how much hydrogen there might  
10 be in a barrel in order to conform to the NRC license  
11 requirements is leading DOE to dump about 15,000 barrels of  
12 true waste into glove boxes -- this is heterogenous waste,  
13 broken glass, tools -- paw over it with gloves in glove  
14 boxes and sort it so they can repackage it into 150,000  
15 barrels, 10 times as much increase.

16 So, because their computer model over-predicts the  
17 hydrogen generation, there is this very large program of  
18 expenditure to people and 150,000 additional barrels will  
19 have to be shipped across the country to WIPP.

20 The basis of saying their estimate is overly  
21 restrictive is when they randomly sampled 150-some barrels,  
22 none of them came within an order of magnitude of what the  
23 model predicted, but the model is what's in the license.

24 Standards, once accepted, tend to receive  
25 widespread application, and like the WIPP case, they lead

53

1 to, in fact, near-term exposure and cost very large amounts  
2 of money.

3 One of the things which impresses me is, unlike  
4 the financial community -- I, for one, seldom point to  
5 things they do as being the right things, but they have  
6 learned to cope with addressing the difference between an  
7 expenditure today and an expenditure in the future by  
8 discount.

9 We haven't done that with risks or public health.  
10 So, what we may be doing here is doing something that  
11 exposes people this year, and clearly, if you ship 150,000  
12 barrels, the accident rate is going to kill some people for  
13 possible saving two or three lives 10,000 years from now,  
14 and that's something we don't know how to cope with, but we  
15 aren't going to.

16 The conflict between EPA and NRC must be resolved,  
17 and I realize that, by putting that down, I'm setting myself  
18 up for a question of how.

19 CHAIRMAN MESERVE: You can just answer it now.

20 MR. LEVENSON: Well, I should say that, obviously,  
21 it's not a technical question, but I will make a side  
22 comment, which is very strictly my own personal opinion, and  
23 that is that the agency and the commissions have a  
24 continuing battle on credibility not only with the public  
25 but with licensees and with the technical community, and you

54

1 may be legally obligated to accept a standard that has no  
2 basis in health and safety, and you may have to do that, but  
3 I, for one, think your credibility would be aided if it was  
4 possible for the Commission to say, from everything that's  
5 been done and our analysis in health and safety, our  
6 previous standard was -- did protect the health and safety  
7 of the public, for legal reasons we have to impose this, and  
8 retain the basis that what you're doing is because you have  
9 to.

10 A question came up about what did people mean by  
11 transparency in decision-making, and there was some  
12 discussion about standards and so forth.

13 I think the part of the decision-making which is  
14 not very transparent to the public, even more so than  
15 reading specs, standards, is the fact that the ultimate  
16 decision is not tied entirely to the technical language of  
17 the standards.

18 There is legal aspects, there's administrative  
19 aspects, there's safety aspects, and there's political

20 aspects, and I know, when we -- I accompanied the committee,  
21 the ACNW, to Nevada for their meeting with the public, and  
22 that was one of the things the public didn't really  
23 understand, that there are a number of things that go into  
24 decision-making, and that, I think, is one of the things  
25 that can be addressed and separated.

55

1 The next slide, 21, multiple barriers and  
2 defense-in-depth -- in the letters I've written, it's clear  
3 that the ACNW has endorsed the staff's approach to Part 63,  
4 and that's still the case, but I think we need to be careful  
5 that it's not intended that it be a prescriptive set of  
6 quantifications in the new case.

7 In its previous letters, the ACNW has made  
8 recommendations on viability assessment, including the PA  
9 requirements. I think primarily those recommendations  
10 include urging more transparency and clear supporting  
11 evidence for the decisions that are made and that the  
12 licensing steps, the outline that is a series of things that  
13 go all the way from the initial safety review to the final  
14 closure.

15 Slide 22, the committee supports the staff  
16 thinking as it approaches multiple barriers, and again, I  
17 was to reiterate that the thinking is that prescriptive  
18 sub-system requirements are not consistent with the move  
19 toward performance-based evaluation.

20 In Part 60, prescriptive sub-system requirements  
21 for sub-systems served well, but they might not always have  
22 been optimum for safety, because they were independent of  
23 system effects, and that's fairly important.

24 The sub-system requirements do need to be spelled  
25 out. We don't want to generate another rock syndrome, but

56

1 we think that they should be spelled out in guidance with  
2 the acceptance based on the performance in the performance  
3 assessment.

4 Now, this will work only if the PA is transparent,  
5 but that should be a requirement in any case.

6 I should hasten to add, the staff is moving in  
7 these directions.

8 On Figure 23, the top bullet is just reiterating  
9 that we think the staff is moving in that way.

10 The last bullet, which actually has five items on  
11 it, two on this slide and three on the next slide, is to  
12 just identify things that the committee is working on and  
13 will be taken up in the next few meetings.

14 On slide 24, the design basis event probably  
15 requires a significant amount of rethinking. Most of the  
16 thinking within the agency on design basis events is related  
17 to reactors and dynamic-type accidents and things that are  
18 not exactly directly relevant to a repository. But there  
19 are some things, like human intrusion, that probably will  
20 require the design basis event as opposed to some other  
21 evaluation of how to go about it.

22 The issue of transportation continually comes up  
23 on everybody's slide, because it comes up with everybody you  
24 talk to.

25 I should say that the general public who live

57

1 right around WIPP may be comfortable with the  
2 transportation, but an awful lot of people, including  
3 representatives of the Conference of Governors and so forth,  
4 are not, and we've heard a fair amount of that, not in the

5 ACNW hearings but in some National Academy hearings in which  
6 I've participated.

7 The WIPP -- it's our understanding that the Yucca  
8 Mountain and the WIPP thing are different in the following  
9 respect:

10 In Yucca Mountain, it appears that DOE has total  
11 responsibility, that they take legal custody for the fuel at  
12 the reactor site, or if it's high-level waste from Savannah  
13 River or somewhere, it's clearly theirs already, and it will  
14 move in licensed containers to a licensed facility, and DOE  
15 has responsibility for everything along the way.

16 That's not exactly the case with WIPP. It isn't  
17 very clear who's responsible for what. DOE is responsible  
18 -- as they are for Yucca Mountain, DOE is responsible for  
19 funding the training of people and providing equipment, but  
20 apparently the responsibility for emergency responses, for  
21 monitoring, for escorting is not a DOE responsibility.

22 That's a state's right issue and it resides with  
23 the states, and when you talk to the people at the state  
24 level -- this was a real issue with WIPP, even more so with  
25 Yucca Mountain -- states haven't done anything because it

58

1 isn't going to be shipped until X years from now, why should  
2 we be doing something about it now, but the local public,  
3 all they see is nothing is being done, they can't get  
4 answers to their questions, and so, it remains a troublesome  
5 issue at the local level, even though any assessment you  
6 want to do, the risks -- the radiological risks are very  
7 close to nil.

8 If you're shipping tens of thousands of trucks  
9 through your community, the accident rate is not nil, and  
10 the committee needs to still cope with what is appropriate  
11 role for the Commission and for the committee, but we  
12 recognize that it seems to be one of the most sensitive  
13 issues.

14 For one thing, at some level up here, members of  
15 the public are concerned about their descendants 10,000  
16 years from now, but at a much more gut level, they're  
17 worried about a truck smashing through a neighbor's car next  
18 month, and so, it's an issue for future considerations.

19 CHAIRMAN MESERVE: Thank you very much.

20 I have no questions, but let me just observe that  
21 this rule-making will come to the Commission, I think, the  
22 end of March, so that you ought to be planning your  
23 activities, as I'm sure you are, to make sure you have  
24 whatever input and advice you can give us as we're  
25 confronting that issue.

59

1 Let me turn to Commissioner Dicus.

2 COMMISSIONER DICUS: Thank you.

3 Two quick questions, one of which you may want to  
4 defer and answer and think about a little bit, which is the  
5 topic you were just on, and whether or not -- and being a  
6 former state person, I appreciate the fact that state people  
7 have mixed emotions on the transportation issue, and I dealt  
8 with that on the Southern States Energy Board, but the  
9 question you may want to consider and get back to us at a  
10 later time -- do you think that DOE is on board and  
11 recognizes that transportation is a political, legal,  
12 public, policy, interest question, even though it may not be  
13 a health and safety question, and they're really prepared to  
14 deal with it?

15 Like I said, you may want to think about that.

16 The other thing, the other question, then, is are



17 you pretty comfortable or do you have any concerns about the  
18 staff's approach on the defense-in-depth issue dealing with  
19 the repository?

20 MR. LEVENSON: Well, the defense-in-depth issue is  
21 an ongoing thing. In fact, there's a meeting in January to  
22 explore the staff's position on that. I'm, at the moment,  
23 not aware, but I will be attending that meeting. I think  
24 the important thing is a recognition that it's an issue that  
25 needs definition.

60

1 My own personal feeling is that, in the end, we  
2 ought to end up with two definitions, because I have trouble  
3 visualizing a detailed definition for defense-in-depth for a  
4 dynamic, high-pressure, potentially catastrophic thing like  
5 a reactor and as it applies to something that is very  
6 passive and slow-moving and slow-acting.

7 So, there's some over-arching requirements that  
8 will be general, but the meeting next month is a joint  
9 meeting between ACRS and ACNW, and I don't know what the  
10 committee members say. I can speak freely and say that I  
11 think it would make more sense to evolve two standards.

12 DR. HORNBERGER: Let me make just a quick comment.

13 I believe that your question relates to Part 63 in  
14 particular, draft part 63.

15 We have, of course, been in contact with staff,  
16 and we're aware of some of the things that they are looking  
17 into. We've discussed with them things like importance  
18 measures and a whole range of things.

19 So, we're aware of some of the developments that  
20 are going on, and in general terms, we are highly supportive  
21 of the directions the staff is taking.

22 COMMISSIONER DIAZ: I really wouldn't dream of  
23 trying to complete your statement, but when you were talking  
24 about EPA and overly-restrictive standards, were you  
25 implying that the superimposition of a ground-water standard

61

1 was an overly-restrictive standard?

2 MR. LEVENSON: Yes.

3 COMMISSIONER MCGAFFIGAN: I think that makes it  
4 unanimous. We dearly hope that EPA will resolve this by  
5 reading the technical comments from all the technical  
6 bodies, including the Academy of Sciences, on that matter.

7 On our rule, you have human intrusion listed here,  
8 and you have others. Were these issues that were brought to  
9 you by the staff's attention or from you reading the  
10 comments that came in from others on Part 63 and saying we  
11 may need to make an additional comment here?

12 For instance, on human intrusion, you have EPA,  
13 DOE, NEI, almost universally, saying that our human  
14 intrusion -- and I think we probably overdid it, too -- that  
15 our human intrusion scenario is overly conservative and  
16 questioning whether we're following the academy and its  
17 advice that what we should do in building a standard is look  
18 at a stylized human intrusion scenario and see if there's  
19 significant degradation, not even under intrusion, 25  
20 millirems to an average member of the critical group.

21 So, I just wonder, partly, was this a list that  
22 was brought to you by the staff or was this a list that you  
23 generated from your own review of the comments?

24 DR. GARRICK: I think it's our list, and we did  
25 observe the staff to make the comment in one of the

62

1 briefings that made to us that went along the lines, if

2 there's a lightning rod in the Part 63, it might be human  
3 intrusion.

4 So, we know that the staff is very aware that this  
5 could turn out to be a significant issue.

6 CHAIRMAN MESERVE: Commissioner Merrifield?

7 COMMISSIONER MERRIFIELD: Getting back to this  
8 issue of our ongoing professional disagreement of opinion  
9 with the EPA in terms of the appropriate health and safety  
10 standards, one of the concerns -- and it gets to the issue  
11 we talked about earlier about risk communication -- is you  
12 have two standards -- ours, which is a 25-millirem, and the  
13 EPA's, which is 15-millirem with a separate 4-millirem  
14 ground water standard -- and from the point of view of  
15 scientists or others sitting around the table, we can come  
16 up with an analysis of why ours is better than theirs, and  
17 presumably they can, as well, but the public -- I'm trying  
18 to give them the benefit of the doubt.

19 I've been accused of being too hard on our sister  
20 agency. I'm trying to be more kind.

21 From the standpoint of the general public, it's  
22 two numbers. The lower has got to be better. You don't get  
23 any greater issue of risk communication than that. How do  
24 we get beyond that? If you want to respond later on, you  
25 can do that.

63

1 MR. LEVENSON: Obviously, it's not easy to do or  
2 it would have been done long ago, but it's why I think the  
3 committee used the term "systems analysis" in referring to  
4 part 63, and part of the dialogue with the public and some  
5 of the dialogue in connection with WIPP, for instance, when  
6 we pointed out that if, in fact, you reduce -- you're overly  
7 restrictive and the result leads to the requirement to ship  
8 150,000 additional barrels, picking a lower number is not  
9 necessarily better or safer, because it leads to other  
10 consequences, and you know, there will be a similar thing  
11 here.

12 You can drive a repository, wherever it may be, to  
13 doing a tremendous amount of fuel handling in the  
14 pre-closure operation and in the packaging that exposes a  
15 lot of people, a lot of radiation exposure which is real,  
16 for mythical things in the future.

17 I don't know how you get the public to realize  
18 that a number out of context is not a measure of safety.

19 DR. GARRICK: Let me comment on that, because I  
20 think here is an opportunity for us to draw a major  
21 distinction between reactor safety and nuclear waste  
22 management safety.

23 In nuclear waste management safety, probably the  
24 principle risk issue is the handling of the waste. This is  
25 not a case where we have a lot of stored energy somewhere

64

1 and if something goes wrong we're going to blow up things.  
2 It's not a dynamic system, as George has already indicated.

3 When you start looking at it on a scenario basis  
4 and a total system basis, one of the things that begins to  
5 jump out at you is that you really ought to be adopting a  
6 strategy that minimizes the handling of the waste.

7 So, clearly, you could say I want to get it down  
8 to a certain number and, in the process of doing that,  
9 increase the risk considerably, and I think this is  
10 especially obvious in the waste business that may not be in  
11 other systems and plants where you worry about that  
12 instantaneous, if you wish, catastrophe or accident.

13 The whole idea of geologic isolation as it was

14 professed in 1957 by the National Academy of Sciences was to  
15 minimize the handling of the waste as a result of taking  
16 advantage of the natural setting, and now we find ourselves  
17 kind of backing off of that and talking more and more about  
18 treatments and handling and losing, if you wish, some of the  
19 appeal and advantage that we were putting forth in the late  
20 '50s as the advantage of geologic isolation.

21 So, lower numbers are not necessarily better if  
22 you take a total risk perspective.

23 COMMISSIONER MCGAFFIGAN: Just very briefly, one  
24 of the commenters -- and I forget which -- has made the  
25 point with regard to the ground water standard, which is

65

1 really two-tenths of a millirem, I think it is, for  
2 iodine-129 -- that's what the de facto standard for this  
3 repository is under the EPA rule -- that that will lead DOE  
4 to make design choices, I think the point you've just been  
5 making, that will actually increase handling but it will  
6 also increase output, because of the radon and other -- it  
7 won't be any big amount, but by focusing so heavily on that  
8 pathway and having a de facto two-tenths of a millirem  
9 standard, you're going to end up generating more through the  
10 air pathway and other pathways because -- you're just not  
11 optimizing as a system.

12 DR. GARRICK: Yes. And I don't want to do it  
13 here, but if we have time in the corridor someday, I'd like  
14 to give you a half-a-dozen examples in the reactor field  
15 where the over-focusing on a single criterion contributed to  
16 risk quite considerably.

17 CHAIRMAN MESERVE: Thank you very much.  
18 Why don't we move on?

19 DR. GARRICK: Yes.

20 Dr. Wymer.

21 DR. WYMER: My topic is facility decommissioning.  
22 We think that it's a very important topic and one that's  
23 growing in importance almost daily. So, we're paying close  
24 attention to it and will continue to pay close attention to  
25 it.

66

1 My presentation has got two parts, really. One is  
2 I'm going to very quickly review our earlier recommendations  
3 in the letter of just about a year ago.

4 Last January, we wrote a letter on this topic, and  
5 so, I'm going to review the recommendations we made in that  
6 letter and give you some insight into what we think has been  
7 accomplished with respect to our recommendations very  
8 quickly, and then the second part of my presentation is a  
9 subset of decommissioning, which is rubblization, which is a  
10 relatively new concept, and I'll discuss a little bit about  
11 that.

12 Going to the first part, our previous committee  
13 recommendations are listed on this slide. I don't want to  
14 say that these recommendations are ours solely and that the  
15 staff hadn't thought of any of these things and therefore  
16 anything that's been accomplished is as a result of our  
17 recommendations.

18 For the most part, they were already on path to do  
19 all of these things. We pretty much endorsed their  
20 position, but they had not accomplished a lot of them at the  
21 time that we wrote our letter a year ago, and so, maybe a  
22 little updating is in order here.

23 With respect to continuing to develop review  
24 criteria for decommissioning, certainly that has been going

25 along a pace and will be finished sometime in the spring.

67

1 The relatively new D&D; screening code for  
2 screening radioactivity levels and thereby providing a path  
3 to license termination -- we suggested that they try that at  
4 a variety of sites. The code was relatively new at the  
5 time.

6 Since then, they have done that, and they have  
7 planned to test the D&D; code. It's my understanding they've  
8 used it at six different sites up to this point, relatively  
9 simple sites.

10 We did suggest that they use the code and screen a  
11 complex site just to see how versatile the D&D; code was.  
12 They have not yet really done that at what we would consider  
13 to be a truly complex site, but that's in the plans.

14 We thought that they should provide  
15 straightforward -- and this is another way of saying  
16 transparent -- guidance on selection, the screening and  
17 site-specific codes, and that has been done. A document has  
18 been prepared that lays out quite clearly, much better in  
19 its second iteration than it was in the first iteration,  
20 what codes apply to what situations and how to select among  
21 the several codes that are available.

22 We indicated that they should continue a program  
23 of licensee and stakeholder involvement. That's been done  
24 in spades. They've done a lot of that in the past year.

25 Shifting gears a little bit, we've concurred with

68

1 the staff that the clearance criteria should be a priority  
2 goal, establishing clearance criteria. This is the  
3 establishment of some sort of regulation or some sort of  
4 standard that allows you to release materials for  
5 unrestricted use.

6 We recognize that's a difficult issue.

7 We know that the staff is differentiating between  
8 clearance criteria now and below regulatory concern earlier  
9 in a sense that below regulatory concern was a policy  
10 position by the NRC, whereas the establishment of clearance  
11 criteria relates to specific situations and specific cases  
12 and it's not stated as a policy position, and that's very  
13 difficult.

14 We do know that the international arena says that  
15 maybe a millirem per year is an adequate limit below which  
16 something should be considered to be free for release.

17 Of course nothing has been adopted in this country  
18 yet, and it's only a working standard internationally, as I  
19 understand it.

20 We do believe that, if this could be done, it  
21 would save a lot of money and it would cycle a lot of useful  
22 and valuable materials back into commerce.

23 We recognize that there is a decommissioning  
24 management board which meets every other week, and we think  
25 that's a valuable integration tool that allows people in the

69

1 various parts of the Commission, of the staff to integrate  
2 and coordinate their activities one with another and sort of  
3 stimulate each other with respect to what to do next and  
4 what's important in a broad sense, and we support that.

5 That's my sort of quick resume of what we  
6 suggested in the past and what has been done since then, and  
7 a lot's been accomplished.

8 I want to move on to rubblization.

9 The best way to start talking about rubblization,  
10 I think, is to give you an example of what rubblization is,

11 as its presently considered, and that would be in the area  
12 of reactor decommissioning and license termination, because  
13 that's the area that's mostly likely, almost certain to come  
14 up first with respect to consideration of this concept, and  
15 there will be other kinds of examples, we think, that might  
16 come up later that are not related, necessarily, to reactor  
17 decommissioning and license termination.

18 We do think that it is a precedent-setting  
19 concept, and by that, I mean it's a different approach to  
20 the handling of low-level -- probably, in this case, very  
21 low-level waste.

22 In the past, there have been regulations --  
23 Britain -- with respect to low-level waste repositories and  
24 the conditions that have to be met.

25 In the case of rubblization, these are more or

70

1 less bypassed and the broader basis for granting a license  
2 termination, either restricted or unrestricted, is the use  
3 of the 25-millirem-per-year standard, as opposed to some of  
4 these other standards that have been written into the  
5 regulations, which are, for example, having survey markers  
6 around the low-level waste repository and having buffer  
7 zones and having clearance monitor stations.

8 These are not necessarily specifically included in  
9 the rubblization concept.

10 It would be acceptable if the ALARA and the  
11 25-millirem-per-year standard were met on the site, after  
12 rubblization and after the site is left.

13 So, it is precedent-setting, and it very likely  
14 will -- clever people in industry who are trying to do  
15 things in the most economical way and still meet their  
16 licensing termination requirements will extrapolate, extend  
17 this concept to other things than reactor decommissioning.

18 For this reason, we think that very careful  
19 attention has to be paid to this concept as decisions are  
20 made with respect to how it is handled. There are as yet, I  
21 think, unforeseen consequences.

22 We think that clearly we are certainly led to  
23 believe that there is a potential for significant cost  
24 savings with respect to the use of the rubblization concept,  
25 and basically rubblization says you take everything outside

71

1 -- in the case of a reactor, take everything outside of a  
2 reactor, all of the equipment, furniture, everything that's  
3 in there, and you're left with nothing but the structure,  
4 you've taken out the core and all these things, and there is  
5 some residual contamination.

6 So, that part of the structure which is above  
7 grade, above surface, you do some amount, a yet unspecified  
8 amount of cleaning up of that surface by scabbling or some  
9 sort of decontamination process to some level which is not  
10 specified but could be, for example, as much as 10 times as  
11 high residual activity left after the cleanup -- could be  
12 maybe as high as 10 times what you would permit under some  
13 of the screening criteria if the building were to be left  
14 standing and to be available for occupancy.

15 So, there is residual activity, and it does not  
16 necessarily meet the screening criteria that have been  
17 established, and then you take these buildings, you convert  
18 them to rubble, anywhere from granular, small granular size  
19 to large chunks, no specification with respect to the degree  
20 of comminution of the concrete, and that would be handled on  
21 a case-by-case basis with respect to what the license

22 termination application contains, and in addition to the  
23 cost savings, which are clear, we think that you need to  
24 understand better than we do what the cost-benefit ratio is  
25 with respect to doing this and what the risk implications

72

1 are, and the risk is not necessarily a negative thing.

2 The risk could go down by this approach because of  
3 -- in some ways it might be done, there would be less  
4 handling of the waste, as opposed to packaging it and  
5 shipping it and putting it in a low-level waste repository.

6 So, the risk could either go up or down, depending  
7 on how it's handled.

8 There is a significant problem, this same old  
9 bugaboo comes up here, with respect to conflicting radiation  
10 standards.

11 We not only have the Federal regulations and the  
12 conflicts there, but we have learned from -- in the case of  
13 the Maine Yankee, where the people gave us a little  
14 discussion, that the state may impose such stringent  
15 requirements that it would make it impractical for them to  
16 go ahead and use the rubblization concept, and they're  
17 waiting for a resolution of these conflicting standards.

18 I don't think there's a whole lot that the NRC can  
19 do about state standards, but nonetheless, this is a central  
20 issue.

21 We're looking for Maine Yankee to come in, we  
22 expect, in the not terribly distant future, that we heard  
23 from those people at our recent presentation last month, and  
24 this will be a test case, and we think a test case for  
25 rubblization is extremely important, because it's here that

73

1 the real issues will emerge, and the issues relate primarily  
2 to how do you demonstrate to the satisfaction of the Nuclear  
3 Regulatory Commission that you will, in fact, meet both the  
4 25-millirem-per-year dose limit and ALARA standards and how  
5 do you measure the amount of radioactivity in rubblized  
6 waste where some of that radioactivity may be internal and  
7 not on the surface, you can't just run a probe over it and  
8 get a measure of it, and so, how do you get the volumetric  
9 measures?

10 Now, we should say that the staff at the NRC in  
11 the research branch have two study projects underway. They  
12 have contracts out to study how do you measure volumetric  
13 contamination, internal contamination, and we think that's  
14 important.

15 We don't really believe that there will be a lot  
16 of radioactivity there, and we think it's reasonably likely  
17 that, when you scabble the surfaces of these concrete  
18 structures, that you will remove the bulk of the  
19 radioactivity and they'll be relatively safe, but you've got  
20 to show it.

21 It has to be demonstrated. The models have to be  
22 produced.

23 Data have to be input, reliable data input to  
24 those models, both with respect to internal contamination  
25 and with respect to leaching of the contamination in

74

1 subsequent times, because this stuff, this concrete is  
2 pushed into the -- that part of -- in the case of reactors,  
3 that part of the reactor containment which is below grade,  
4 and it's covered over with dirt, and the real goal of  
5 rubblization is to get to unrestricted license termination.

6 That's what the desired goal is, and in order to  
7 accomplish this, models and the input have to demonstrate

8 that.

9 So, sort of a bottom line here, it's our view that  
10 restricted and unrestricted license termination, which it's  
11 going to be at a site where rubbleization has occurred, that  
12 distinction is fuzzy, and the staff will have to be very  
13 careful in walking their way through this, since there will  
14 be residual activity left on the site.

15 It's not like normal, where you think about green  
16 field, where somebody comes in and they raze a building,  
17 tear it down, and everything is hauled away to Envirocare or  
18 somewhere and it's clean and there's nothing left that was  
19 formerly there.

20 This is not the same. There's something left.  
21 The question is can it be made unrestricted with respect to  
22 the termination?

23 As a general position, our position, I think, is  
24 that we've favorably disposed toward rubbleization. We think  
25 it's a good idea. We'd like to see it practiced, if it can

75

1 be.

2 We think that there are a lot of difficult issues  
3 to be addressed, and they will best be addressed, probably,  
4 by actually looking at rubbleization proposals.

5 I'm through.

6 CHAIRMAN MESERVE: Thank you very much.

7 In order to allow time -- we've really run through  
8 a lot of time, but in order to allow time for Dr. Garrick to  
9 give an abbreviated presentation on self-assessment, I'm  
10 going to defer asking any questions and turn to my  
11 colleagues and see if I can get similar restraint.

12 COMMISSIONER DICUS: We will follow suit. I may  
13 put a question in writing later.

14 DR. GARRICK: All right.

15 I've got some good news. This last presentation,  
16 as I indicated at the outset, is more on process than  
17 technical issues, and I think we can shorten it quite  
18 considerably, and it's been put together such that it's  
19 fairly self-explanatory, and let me just say that the  
20 committee has been singing a variety of tunes in our advice  
21 about what the staff should do and look for in the  
22 applications, and one of those tunes has had to do with the  
23 application of a systems approach, systems thinking.

24 So, we decided a couple or three years ago that  
25 maybe we ought to practice what we preach in terms of

76

1 applying a systems approach to helping us better organize,  
2 plan, and prioritize the issues that we should address, and  
3 we were partly also inspired to do by the strategic planning  
4 process that the NRC went through, and these next exhibits  
5 primarily address some elements of that process that are all  
6 well-documented.

7 Exhibit 33 just simply delineates the by-lines of  
8 our first-tier priorities.

9 Exhibit 34 identifies our second-tier priorities,  
10 by which we mean, if the opportunity allows us to go beyond  
11 our priorities, these are the leading candidates for the  
12 committee's consideration, and then the -- an adjunct to the  
13 planning process was the process of self-assessment, and we  
14 tried to systematize the self-assessment process.

15 We put a lot of energy into trying to come up with  
16 simplifying exhibits that would do this.

17 One of the exhibits that we're kind of pleased  
18 with is the development of a self-assessment matrix that

19 lines up our evidence and our metrics in such a way that you  
20 can get a quick snapshot of what we consider ourselves as  
21 doing and the effectiveness with which we're doing it.

22 As far as looking for evidence that our advice was  
23 useful, we have emphasized, as indicated on slide 35, direct  
24 evidence, including licensee response, customer feedback,  
25 staff requirement memos, EDO responses, and any indirect

77

1 evidence that we can see as a result of NRC actions, and as  
2 I see and as noted on 36, we created a matrix to track that,  
3 and we repeat this process every year.

4 We have currently scheduled time to do that next  
5 year in the month of February, and we'll go through the same  
6 two steps, the action planning and the self-assessment.

7 As far as what we've learned from this process,  
8 we've learned a great deal.

9 We have learned that the effectiveness of the  
10 committee is greatly stimulated when we kind of reach out  
11 and become creative on what the issues are and also when we  
12 are very sensitive to the Commission's interests, as a  
13 result of meetings like this, and follow up on those.

14 We do try to use the action plan as a basis for  
15 our operating plan and provide our executive director with  
16 information that will perhaps assist him in establishing  
17 budgets and so forth for the conduct of the advisory  
18 committee's business.

19 Let me end by just saying and highlighting what is  
20 coming.

21 Most of what we've been talking about will be  
22 documented in the form of letters and will be forthcoming,  
23 and that includes a letter on risk communication and the  
24 safety assessment process as it was evaluated in the working  
25 session, workshop, and the public meeting in Las Vegas in

78

1 October.

2 We will be addressing the draft environmental  
3 impact statement and some particular issues there.

4 As was already noted in several of the  
5 presentations, the ACRS and ACNW are planning a joint  
6 meeting on January 12th -- or 13th and 14th -- on the matter  
7 of defense-in-depth, and we're looking forward to that.

8 We are optimistic that there's probably some  
9 fundamental aspects of defense-in-depth that are basic  
10 enough that would apply to both reactors and waste, but  
11 beyond that, we should not be bounded in the implementation  
12 or application phase of one over the other and that the  
13 implementation will -- should take full advantage of the  
14 peculiarities and properties of the two activities.

15 We are writing a letter on decommissioning,  
16 rubblelization in particular, and also on the research  
17 activities.

18 The next page, page 39, we will be passing on some  
19 additional views on Part 63, and of course, when we complete  
20 our February planning and self-assessment exercise, we will  
21 be forwarding to you the new plan, together with a summary  
22 and interpretation of both.

23 CHAIRMAN MESERVE: Let me speak for myself and say  
24 that I very much appreciate your efforts to undertake this  
25 self-assessment process. It's a very healthy thing to be

79

1 doing.

2 I have no questions about this presentation. It  
3 may well be that there will be some as to all of these that  
4 we'll submit to you later.



5 DR. GARRICK: Yes.

6 CHAIRMAN MESERVE: Let me turn to my colleagues  
7 and see if they have any questions that they'd like to ask  
8 at this time.

9 COMMISSIONER MERRIFIELD: I don't have a question.  
10 I have a comment I'd like to make.

11 COMMISSIONER DIAZ: I have a quick comment.  
12 It would be worthwhile to the Commission to get  
13 your views on how can the staff differentiate between  
14 restricted and unrestricted release.

15 COMMISSIONER MCGAFFIGAN: I do want to compliment  
16 the committee for all of its work. I think you do very good  
17 work, and going back to Dr. Wymer's presentation, I think,  
18 on the D&D; code and decommissioning issues, we're all  
19 searching for overly conservative assumptions, bias  
20 analyses, and I think you've been very useful in all of  
21 that.

22 I'm glad to see you are going to address the DOE  
23 DEIS. We were getting some indication you weren't. I think  
24 what is a technical issue and what isn't isn't always clear.  
25 For the transportation issues and risk communication in

80

1 transportation, I think is a technical issue. Somebody  
2 might argue it's not, but I look forward to seeing those  
3 comments.

4 But they do need to get in fairly quickly, because  
5 our overall comments have to be formulated and to DOE by the  
6 9th of February.

7 DR. GARRICK: We're aware of that, yes.

8 COMMISSIONER MERRIFIELD: In deference to the  
9 Chairman, I didn't ask any questions relative to  
10 decommissioning. However, I did have an opportunity last  
11 month -- actually, it was earlier this month -- to visit the  
12 Haddam Neck site up in Massachusetts, where they are very  
13 actively engaged in that process, and like Commissioner  
14 Dicus, I did take the opportunity to meet with a variety of  
15 stakeholders there and members of the community who are  
16 concerned about that.

17 I think, overall, there is a concern -- and I  
18 don't think they were as sensitive to some of the  
19 rubblization issues as perhaps individuals surrounding Maine  
20 Yankee, since that seems to more close to where they are in  
21 the process at this point.

22 I think there was an underlying concern that even  
23 if we -- even if that were to be allowed and if it were to  
24 allow unrestricted use, would that mean that the site could  
25 be utilized for future purposes for the community, and I

81

1 think that was one of things that underlies their concern.

2 It might be clean, or at least clean enough for us  
3 to release it, but is it something that can be utilized for  
4 an industrial purpose or some other community-based land  
5 use, and I think that's something that we need to be mindful  
6 of.

7 The second thing is, in your analyses, I hope you  
8 not only will be thinking about some of the radiological  
9 concerns associated with those materials but also the  
10 non-radiological impacts and leaching that might result from  
11 the rubblization activities.

12 Further, I would hope that there are some specific  
13 questions that you will be able to come up with to assist  
14 the staff in asking the hard questions about rubblization.

15 I know, obviously, you indicated that you are

16 predisposed toward recommending rubblization, but I still  
17 think, in order to be fair to people who live around those  
18 sites, we do need to ask the hard questions and make sure  
19 that we are fully satisfied, all of us, in that regard.

20 CHAIRMAN MESERVE: Thank you.

21 If there are no further questions, I'm going to  
22 bring this meeting to a close.

23 I'd like to express my appreciation to the  
24 advisory committee and to Mr. Levenson for your  
25 participation today.

82

1 You've touched on many issues which are really  
2 central to our activities and very important to us, and we  
3 very much appreciate your thoughtful assistance, and with  
4 that, we're adjourned.

5 [Whereupon, at 11:42 a.m., the meeting was  
6 concluded.]

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25