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**NUCLEAR REGULATORY COMMISSION**

Title: 10 CFR Part 61: site-specific analysis for  
Demonstrating Compliance with Subpart C  
Performance Objectives

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Pages 1-200

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1 UNITED STATES OF AMERICA

2 NUCLEAR REGULATORY COMMISSION

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4 PUBLIC MEETING ON PROPOSED RULEMAKING

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6 10 CFR PART 61: SITE-SPECIFIC ANALYSIS FOR

7 DEMONSTRATING COMPLIANCE WITH SUBPART C

8 PERFORMANCE OBJECTIVES

9 + + + + +

10 WEDNESDAY, MAY 18, 2011

11 + + + + +

12 The meeting was held at the Legacy Hotel and  
13 Meeting Centre, 1775 Rockville Pike, Rockville, MD, at  
14 8:30 a.m., George Smith and Brett Leslie, Co-  
15 Facilitators, presiding.

16 PRESENT:

17 GEORGE SMITH, U.S. NRC Region I, Co-Facilitator

18 BRETT LESLIE, U.S. NRC, Co-Facilitator

19 LARRY W. CAMPER, U.S. NRC/FSME, Director, Division of  
20 Waste Management and Environmental Protection

21 ANDREW CARRERA, U.S. NRC/DILR

22 DAVID ESH, U.S. NRC/FSME, Division of Waste Management  
23 and Environmental Protection

24 PRIYA YADAV, U.S. NRC/FSME, Project Manager, Division  
25 of Waste Management and Environmental Protection

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PUBLIC COMMENTERS PRESENT:

JERRY BONANNO, NEI\*

WARD BRUNKOW, URENCO

TISON CAMPBELL, U.S. NRC/OGC

WILLIAM DORNSIFE, Waste Control Specialists

LISA EDWARDS, EPRI

ELIZABETH FORNASH, U.S. DOE\*

JOHN GREEVES, JTG

RICH JAVATI, Pennsylvania Department of Environmental  
Protection\*

SUSAN JENKINS, State of South Carolina\*

MICHAEL KLEBE, State of Illinois\*

LISA LONDON, U.S. NRC/OGC

RUSTY LUNDBERG, Utah Division of Radiation Control\*

THOMAS MAGETTE, Energy Solutions

ANDREW MAUER, NEI

SEAN McCANDLESS, Energy Solutions

DAVID McINTYRE, U.S. NRC PAO

CHRIS McKENNEY, U.S. NRC

JUAN MONTESINOS

COREY MYERS, Studsvik Inc.

MAUREEN O'DELL, U.S. DOE\*

LISA PHILLIPS, U.S. DOE

EDWARD REGNIER, U.S. DOE

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1 MARTIN SCHNEIDER, FM Pubs

2

3 PUBLIC COMMENTERS PRESENT: (cont.)

4 DAN SCHULTHEISZ, U.S. EPA\*

5 ROGER SEITZ, Savannah River National Laboratory\*

6 DAN SHRUM, Energy Solutions

7 DANNY SMITH, U.S. DOE\*

8 LINDA SUTTORA, U.S. DOE

9 REBECCA TADESSE, U.S NRC

10 JEAN TREHAFEL, U.S. NRC

11 LIZ WOODRUFF, Snake River Alliance\*

12

13 \*Present via telephone

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

(8:35 a.m.)

MR. SMITH: Good morning, everyone. I'm George Smith from US NRC in King of Prussia Region I.

I'd like to welcome everyone to the 10 CFR Part 61 public meeting for the proposed rule text revision.

We're going to start off the meeting by allowing everyone at the table to introduce themselves. And, also, I'd like to remind you, make sure you turn the other microphones on when you speak.

MR. CARRERA: Good morning and welcome. My name is Andrew Carrera, and I work in the Rulemaking Branch. I'm also the Project Manager, Rulemaking Project Manager for this Part 61. Thank you.

MR. ESH: Hi, I'm David Esh. I work in the Performance Assessment Branch, and I do a lot of the work, like help develop rule text and associated guidance, those sorts of things.

MS. YADAV: Hi, my name is Priya Yadav. I'm a Project Manager in the Division of Waste Management and Environmental Protection.

MR. SMITH: Okay. Thank you very much.

We'd like to find out who's on the --- who has called in on the meeting, and to make sure you can

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1 actually hear us.

2 (Telephone introductions off-mic.)

3 MR. SMITH: Okay. We'd like to remind you,  
4 if you've called in to place your local bridge on  
5 mute.

6 Okay. This meeting today is intended to  
7 inform the stakeholders of the current status of the  
8 NRC activity, and to solicit public comments.

9 Also, before I continue, I'd like to say  
10 Brett Leslie is in the back. He's also the Co-  
11 Facilitator. You will see him at the lunch break.  
12 And, also, he has the mic, so if you can, if you can  
13 wait until Brett comes around with the mic if you're  
14 going to speak so those on the bridge can hear you.  
15 Also, we have the meeting being recorded by Kayla, so  
16 if you can speak into the mic so Kayla can record your  
17 comments.

18 Okay. A point of emphasis for the agenda.  
19 I just want to make sure everyone knows that the --  
20 from 10:45 to 12 noon the comments that we'll be  
21 soliciting will be in reference to the rule text. And  
22 then from 1 to 4:15 the comments that we'll be  
23 soliciting will be from the day's presentation on the  
24 period of performance.

25 So, before we go on, we do have some

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1 comment cards. So, while we are soliciting the  
2 comments, we'll utilize the comment cards to call upon  
3 you. Then you can wait for the mic. If there's  
4 anyone else that would like to have comments, just let  
5 us know.

6 Also, for those who have called in, we'll  
7 give you an opportunity to let us know if you're going  
8 to provide comments. We'll first do the comments here  
9 in the room, and then we'll go to those who have  
10 called in.

11 Now, I'd like to go over the ground rules.  
12 As you know, for all facilitators we like to have  
13 ground rules for the meeting. And the ground rules  
14 are in hope that -- I'm sorry. Do you have anything?

15 MR. LESLIE: George, we're having a little  
16 trouble with the webinar right now, so I think we need  
17 to wait for just a minute as Antoinette figures out if  
18 we can get them in.

19 MR. SMITH: Okay.

20 MR. LESLIE: Okay. Good enough.

21 MR. SMITH: So, those who have called in,  
22 I don't know if you've heard Brett, but we're going to  
23 hold the meeting for a couple of minutes to get the  
24 webinar on line.

25 (Whereupon, the proceedings went off the

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1 record at 8:40:00 a.m., and went back on the record at  
2 8:48:20 a.m.)

3 MR. SMITH: Okay. My name is George  
4 Smith. I'm from NRC Region I in King of Prussia.  
5 I'll be one of your Co-Facilitators, and Brett Leslie  
6 is here in headquarters, and he will also be one of  
7 the Co-Facilitators.

8 We're going to go ahead and start the  
9 meeting. We're still trying to get the webinar up.

10 Again, for those -- we had one response  
11 for those on the bridge that would like to provide  
12 comments. And for those who came later on the bridge,  
13 just to let you know, when you provide comments, from  
14 10:45 to 12, those comments would be in reference to  
15 the rule text. And the 1 p.m. to 4:15 comments would  
16 be from the day's presentation on the period of  
17 performance.

18 We've had the presenters to present their  
19 name. We'll go over the ground rules, and then we'll  
20 get the meeting started.

21 Again, the ground rules are mainly to aid  
22 in the meeting in order -- we hope to enhance the  
23 meeting. The first rule, respect for our participants.

24 And, basically, we like for all participants in a  
25 meeting to be able to get their point out, allow the

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1 briefers to provide the information, and for those  
2 participants who'd like to ask questions, allow you to  
3 be heard.

4 We also have Kayla, who is transcribing  
5 the meeting, so we'd like Kayla to be able to hear the  
6 information that's being presented at the meeting.  
7 Also, we'd ask you to wait for the mics to come  
8 around. Brett will bring the mic around for you, if  
9 you can speak into the mic, and we'll get the  
10 information.

11 We're going to start off after the  
12 presentations. We'll limit the feedback from the  
13 stakeholders to about five minutes at this point, and  
14 we'll go from that point, as far as allowing more  
15 time.

16 Also, as far as respect for the  
17 participants, we'd ask not to engage in sidebar  
18 conversations while we're speaking in the meeting,  
19 again, so everyone can be heard, and we can -- Kayla  
20 can get her information.

21 We also would ask you to put your cell  
22 phones on the courtesy mode and, basically, silence or  
23 vibrate.

24 Now, we will be using the parking lot  
25 during the meeting. You'll see Brett or I up at the

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1 parking lot, and we'll try to capture information that  
2 we may have to come back for clarification with one of  
3 the meeting participants.

4 Okay. Brett, do you have anything else?  
5 Okay. Thank you very much. We're going to go ahead  
6 and start the meeting, and we're going to start it off  
7 with Larry. You're going to start? Larry?

8 MR. CAMPER: Sorry. Good morning,  
9 everybody. Thank you for being here. This is one of  
10 several public meetings that we've had around topics  
11 associated with Part 61 in our regulations.

12 There's a lot going on these days, and  
13 I'll touch upon some of that during my remarks, but I  
14 want to start out by thanking all of you for being  
15 here, and for being active during the day, as I know  
16 you will be. I look around the room and see many  
17 familiar faces. I know they aren't shrinking violets,  
18 so we look for your input. For those of you who are  
19 fairly new to the process, we welcome your input, as  
20 well.

21 I want to thank the staff in front of you  
22 for the work they're going to do today. I want to  
23 thank our facilitators in advance, of course, our  
24 court reporter, and Antoinette, who is the young lady  
25 at the back of the room. An awful lot of work goes

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1 into making these things happen, and I greatly  
2 appreciate the efforts of all the staff and the  
3 facilitators for the work you're going to do, have  
4 done, and will do. And, of course, for all your  
5 participation today. Next slide.

6 Okay. Just by bit of background, I think  
7 most of you are familiar with this, but so that we're  
8 all on the same level playing field, when Part 61 was  
9 created back in the late `70s, and went into effect, I  
10 think, in 1982, there was a set of conditions that  
11 were analyzed by the staff at that time. And a  
12 regulatory part for the disposal of low-level waste in  
13 the United States was embodied within our Part 61.

14 At that time, there were 37 waste streams  
15 that involved 24 radionuclides that were analyzed by  
16 the NRC staff. There were certain defined volumes of  
17 rad waste and concentrations of radioactive waste that  
18 were assumed in the analysis that went into play at  
19 that time.

20 One significant parameter that was  
21 considered at the time, but ultimately did not make  
22 its way into Part 61 was uranium and, in particular,  
23 depleted uranium, the disposal of depleted uranium.  
24 At that time, the quantities of material that were  
25 considered to be disposed were minimal, indeed, by

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1 comparison to what has actually happened over time,  
2 and certainly the challenges that we face today. And  
3 that is one of the cornerstones of why we are  
4 conducting this particular rulemaking process, and  
5 we'll talk more about the parameters of that  
6 rulemaking process today.

7 Many of the assumptions have changed.  
8 Uranium enrichment, of course, has come back on the  
9 scene in terms of commercial uranium enrichment.  
10 There's large quantities of depleted uranium to be  
11 disposed of by the Department of Energy from  
12 stockpiles currently at Paducah and Portsmouth. The  
13 staff talked about this at great length in our SECY-  
14 08-0147, which we produced in 2008, of course.

15 DOE use of commercial low-level  
16 facilities, the notion of the idea of commercial spent  
17 nuclear fuel has gained traction. We currently have a  
18 regulatory initiative underway at the NRC looking at  
19 that issue much more closely. And then there have  
20 been significant changes in the ways in which the  
21 nuclear power industry, in particular, has managed its  
22 waste; on one hand, tremendous reductions in waste  
23 volume over the past 30 years, and the emergence of  
24 the possibility of using a concept known as blending.

25 Next slide, please.

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1           The Low-Level Waste Program at the NRC is,  
2           ironically, in a monitoring mode. A decision was made  
3           in our organization several years ago by the  
4           Commission, given that we had received no applications  
5           for low-level waste sites, that we would go into a  
6           monitoring mode, if you will. And the staff was  
7           reduced in size accordingly. But we have hardly been  
8           in a monitoring mode in the last three or four years  
9           in policy space.

10           In fact, as an organization we face many  
11           challenges in policy space. And we work diligently to  
12           try to address these issues, to address them in  
13           current terms while also looking ahead as to whether  
14           or not any potential changes should be made to Part 61  
15           at large.

16           But there has been, of course, recently a  
17           new disposal site that's received a license in the  
18           State of Texas, and in the process of going through  
19           some changes there that may, in fact, allow  
20           importation of waste from outside of that particular  
21           compact.

22           We did our Low-Level Waste Strategic  
23           Assessment in 2007. We identified 20 items that  
24           needed analysis in the low-level waste arena, of which  
25           seven were identified as a high-priority item. And

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1 then, of course, there has been the movement by the  
2 industry in terms of innovation to address the  
3 challenge that we face in the United States today with  
4 regards to disposal access for Class B and Class C  
5 waste, a concept referred to as blending.

6 We have five initiatives going on today in  
7 the low-level waste arena that touch Part 61. We have  
8 an assignment before us now from the Commission to  
9 risk-inform the waste classification tables in 61.55.

10 This is an assignment that came out of the Staff  
11 Requirement Memorandum that was associated with SECY-  
12 08-0147, which was what we refer to as the Depleted  
13 Uranium Paper. That initiative is currently underway.

14 I'll touch upon it just a little bit later in some of  
15 my remarks.

16 We are updating our Concentration Branch  
17 Technical Position. We had a public meeting in  
18 February, and some of you here participated in that.  
19 The BTP is a very important document used extensively  
20 by the industry as it manages low-level waste. It  
21 needs to be updated, and we're in the process of doing  
22 that.

23 We are also revising the Volume Reduction  
24 Policy Statement that was created in 1981. Just for  
25 recall, that Volume Reduction Policy Statement focused

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1 upon just that, volume reduction. And volume  
2 reduction has been done very well by the industry at  
3 this point in time, I think it's fair to say.  
4 However, there are other ways and tools, and  
5 instruments involved with managing low-level waste.  
6 So, what we're trying to do is update that policy  
7 statement to reflect the current status of affairs  
8 using all tools possible to safely manage low-level  
9 rad waste.

10 We have the Part 61 site-specific  
11 rulemaking, which is the subject of today's public  
12 meeting, and we have a substantial ongoing public  
13 outreach effort in connection with a SECY Paper  
14 identified as 10-0165, and this is a paper that  
15 identifies five options for looking more broadly at  
16 Part 61.

17 In terms of the site-specific rulemaking  
18 that we're going to be discussing today, the site-  
19 specific analysis rulemaking, it will introduce an  
20 explicit performance assessment requirement. It does  
21 specify human intrusion calculations, and the staff  
22 would provide technical guidance to support that  
23 rulemaking should it, in fact, become a reality. Next  
24 slide, please.

25 In terms of the meeting today, it's an

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1 opportunity for enhanced stakeholder feedback and  
2 input regarding our proposed draft language at this  
3 point in time. The staff is seeking early feedback on  
4 the draft proposed rule text before the draft proposed  
5 rule actually goes to the Commission. This is an extra  
6 step in the process, if you will.

7           The Commission, when it gave us direction  
8 on pretty much all of our assignments associated with  
9 Part 61, there's a common thread that runs through  
10 each of those directions to us, and that is to  
11 maximize public input, seek stakeholder input. So,  
12 this meeting today is an extraordinary meeting in the  
13 sense that it's in addition to what we would normally  
14 do.

15           So, with that in mind, we really want to  
16 invite comment. We want to inform you as to what the  
17 current thinking is by our staff with regards to  
18 preliminary rule language. What you say today, and as  
19 we analyze that commentary, may cause significant  
20 changes in the contents of the proposed language.

21           We're going to consider all the comments.  
22 We're not going to, specifically, answer every  
23 comment. However, if changes come about as a result  
24 of this meeting today, then the Statements of  
25 Consideration in the proposed rule would reflect those

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1 changes that result from this meeting today.

2 I want to go straight to something that I  
3 know is going to be a very interesting discussion this  
4 afternoon. That's for period of performance. For  
5 those of you who have read the language, and I suspect  
6 most of you have, the staff is proposing a period of  
7 performance that would be 20,000 years. That's a new  
8 number. Any time you put a new number in play, you  
9 can expect to hear about it. Some like it, some don't  
10 like it, some are neutral about it, and so forth.  
11 That's fine.

12 What we need is your input. And the  
13 challenge that I would give you as you listen to our  
14 presentation this afternoon around that subject, when  
15 we have our discussion this afternoon around that  
16 subject after you hear Dr. Esh's presentation about  
17 it, is if not 20,000 years, then what and why?

18 We are dealing with a unique challenge  
19 called depleted uranium. We've had two public meetings  
20 already around this topic, one here in Washington, one  
21 in Salt Lake City. We had two very good panels that  
22 provided guidance to us. We had a lot of public  
23 input. We have taken all that into consideration,  
24 scratched our heads and looked at this technical  
25 challenge with a great deal of thought. So, if it's

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1 not 20,000 years, what is it, and why, given the  
2 challenge that we face. Next slide, please.

3 What you see here is a graphic that points  
4 out a number of public outreach opportunities. I think  
5 there are seven of them there that are in red. This  
6 addresses four of the major initiatives that are going  
7 on. The other one that's not depicted here is the  
8 staff's charge to risk-inform the waste classification  
9 tables of 61.55. And the reason that's not here is  
10 because, at the moment, we do have that underway;  
11 however, budget decisions have caused us to delay the  
12 majority of the activity for that particular  
13 initiative into the Fiscal Year 2013. But as we  
14 proceed down the road and work on that more, we will  
15 have public meetings around that particular topic, and  
16 we'll put more information up about public  
17 opportunities.

18 But these are the opportunities that you  
19 see regarding the site-specific rulemaking analysis,  
20 excuse me, the rulemaking requiring a site-specific  
21 analysis, the subject of today's discussion, the  
22 concentration averaging BTP, the Volume Reduction  
23 Policy Statement, and the SECY-0165 which is looking  
24 at possible revisions to Part 61.

25 For those of you who are listening in, you

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1 can't see the dates. We apologize for that. We  
2 certainly will put this information out there and make  
3 it publicly available. But identify several dates,  
4 seven different times when there's opportunities for  
5 public input.

6 As I said before, the Commission is  
7 strongly interested in a lot of input from  
8 stakeholders around Part 61. Part 61 has served us  
9 well. It is adequate to protect public health and  
10 safety, but it has been in place a long time, and a  
11 number of things have changed since it first went into  
12 existence, as I cited earlier. So, maximizing the  
13 opportunity for input is terribly important.

14 So, I think with that, I'll stop. Again,  
15 I will thank you all in advance for the comments that  
16 you will make today, and I encourage you to actively  
17 participate. I know that you will. And I thank the  
18 staff again in advance for the presentations they're  
19 going to make. I have, obviously, looked at the  
20 slides several times, met with the staff several  
21 times, and I think they're going to give you an  
22 excellent overview of this proposed rule.

23 So, with that, I'll stop and do you want  
24 me to entertain any clarification questions, or do you  
25 want to proceed? Any questions of clarification?

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1 Lovely. Welcome.

2 MR. SMITH: Again, for those on the line,  
3 I'm George Smith, one of the Co-Facilitators. And,  
4 again, just to emphasize, if you called in to make  
5 sure you place your phone, your local bridge on mute.  
6 And we're going to start the briefing. We'll start  
7 with Priya. Okay.

8 MS. YADAV: Thanks, Larry, for that  
9 introduction. I'd like to welcome you to the public  
10 meeting for the site-specific analysis rulemaking. I  
11 am Priya Yadav. I'm a Project Manager in the Division  
12 of Waste Management Environmental Protection.

13 I'm going to give you a background  
14 presentation today, just kind of how we go to where we  
15 are today, and then I'll turn it over to Andy to give  
16 you specifics on the proposed rule language. And then  
17 after that, Dave will give a longer discussion on the  
18 period of performance. Next slide, please.

19 This is an overview of my presentation.  
20 I'll just give a little bit of background, talk about  
21 our recent activities in this area, describe the  
22 Regulatory Basis Document, and then talk a little bit  
23 about the guidance document that we will be issuing in  
24 conjunction with this rulemaking.

25 As Larry touched on, the landscape for

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1 low-level waste today is significantly different than  
2 it was when the initial Part 61 was developed. These  
3 are two of the major changes.

4 In the 1980s, the Department of Energy was  
5 the primary generator of large quantities of DU.  
6 There were no commercial sources of this waste stream  
7 at that time, so only small quantities of DU were  
8 included in the environmental documents associated  
9 with Part 61.

10 Today, there are commercial enrichers,  
11 there's large quantities of DU being generated by  
12 commercial generators, and the Department of Energy is  
13 considering disposing of their DU at sites, disposal  
14 facilities that are regulated by NRC Agreement States.

15 The second change is with the closure of  
16 Barnwell in 2008, lots of low-level waste generators  
17 have no options for disposal for their Class B and C  
18 waste, so industry has been contemplating large-scale  
19 blending of waste to increase their disposal options.

20 The Commission recognized that the  
21 landscape is significantly changing, so they issued a  
22 couple of directions for us to really look at existing  
23 regulations, and evaluate what we need to do. So,  
24 during the LES hearings for the National Enrichment  
25 Facility, they directed staff to look at the depleted

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1 uranium issue, and just consider whether these large  
2 quantities warrant amending Part 61. Next slide.

3 Similarly, after Barnwell closed in 2008,  
4 the Chairman issued a memorandum that staff should  
5 really provide a clarification of our position on  
6 blending, and look at whether or not we need to revise  
7 regulations for the blending issue. Next slide.

8 So, staff's response to these directions  
9 was to develop two Commission papers. The first was  
10 in 2008, that's the DU SECY Paper 08-0147. That  
11 provided a range of regulatory options that were  
12 informed by a technical analysis. So, it was the  
13 probabalistic screening model that we use to look at  
14 the impacts of DU disposal.

15 And, similarly, in 2010 we wrote a SECY  
16 Paper on blending, and that presented a range of  
17 regulatory options to the Commission that looked at  
18 policy, technical, and regulatory issues associated  
19 with the blending issue.

20 The Commission directed us through Staff  
21 Requirements Memorandums how to proceed on these two  
22 issues. On the DU front, they directed us to proceed  
23 with a rulemaking to require a site-specific analysis  
24 to demonstrate meeting performance objectives prior to  
25 disposal of large quantities of DU. They directed the

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1 staff to specify the criteria for the site-specific  
2 analysis, and also to issue supporting guidance that  
3 will assist licensees and Agreement State regulators  
4 in both performing these performance assessments, and  
5 reviewing these performance assessments.

6 Similarly, on the blending front, they  
7 actually -- the Commission directed staff to  
8 incorporate the blending issue along with it into the  
9 DU rulemaking. So, the rulemaking that we're talking  
10 about today, we're calling it the site-specific  
11 analysis rulemaking. It covers both of these emerging  
12 issues, DU and blending. Next slide.

13 To implement the direction in the SRMs,  
14 we've had some recent activities. I think a lot of  
15 you participated in some of these activities. In  
16 2009, we had two workshops, one in Bethesda, and one  
17 in Salt Lake City. And we had roundtable discussions  
18 at each workshop that had a variety of stakeholders.  
19 We had viewpoints from generators like DOE and LES,  
20 from disposal facility operators like Energy Solutions  
21 and WCS. We had Agreement State regulators from Texas,  
22 and Washington, and South Carolina. We had professors  
23 from universities, and we had public interest groups  
24 that participated, and we really got a range of good  
25 discussion on a variety of technical topics. Period

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1 of performance was one of them. We also talked about  
2 radon generation. And that was really our first input  
3 from all of you guys that gave us a lot of feedback  
4 that helped us kick off these rulemaking efforts that  
5 you'll see today.

6 At the end of the year in December, and  
7 also in February 2010, we briefed the Advisory  
8 Committee on Reactor Safeguards on the status of our  
9 rulemaking efforts, and we received a letter from them  
10 that just recommended that we continue our rulemaking  
11 efforts to inform the regulations for disposal of DU  
12 based on site-specific realistic performance  
13 assessments. Next slide, please.

14 We heard one or two requests at the  
15 workshops, and these kind of drove our next two recent  
16 activities. We had a request to issue some guidance  
17 before we could issue our complete draft guidance  
18 document, so we issued interim guidance in April 2010,  
19 which was a letter, in the form of a letter to  
20 Agreement States summarizing existing guidance that is  
21 relevant in reviewing performance assessments.

22 And then a second request that we got at  
23 the workshops was to have more information on the  
24 screening model that we included in our DU SECY Paper,  
25 so Dave and Chris led a public workshop in June 2010

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1 where participants got to ask more questions on how to  
2 use Goldzim, and details of the screening model that  
3 we used. Next slide, please.

4 So, all these interactions informed our  
5 first document in this rulemaking process, which is  
6 called the Regulatory Basis. And what that is is  
7 really staff's input on why we think regulations need  
8 to be changed for Part 61. So, this document  
9 describes the existing regulatory framework,  
10 identifies any issues with the framework, and just  
11 outlines our basis for changes that we're making in  
12 Part 61. Summarizes the interactions that we had that  
13 I just talked about, and then also considers some  
14 alternatives.

15 So, the regulatory -- sorry, next slide.  
16 The Regulatory Basis has a few proposed changes, I'm  
17 just going to quickly go over. The first two are to  
18 revise the performance objectives. So, the first  
19 change to the performance objective is to fix -- amend  
20 61.41 to require licensees to conduct a site-specific  
21 performance assessment prior to disposal of all waste  
22 streams. And the analysis would be used to identify  
23 if certain waste streams need to be restricted or  
24 prohibited at specific sites.

25 The second change of the Regulatory Basis

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1 identified is to modify 61.42 to specifically require  
2 conducting an intruder assessment at the end of a  
3 period of active institutional controls.

4 Additional changes identified in the  
5 Regulatory Basis are just to reduce ambiguity, and  
6 facilitate implementation of Part 61. So, these are  
7 some changes that we're proposing to provide a period  
8 of performance, which is actually feedback that we got  
9 from the workshops, so that was good feedback that we  
10 used.

11 Also, to provide a dose limit in the 61.42  
12 performance objective. And provide a requirement for  
13 long-term analysis, and also make some changes to the  
14 concept section, just to reduce ambiguity and provide  
15 some clarity. Next slide.

16 The last thing I want to touch on is the  
17 guidance document that we're working on in conjunction  
18 with this proposed rule language. We plan -- we're  
19 working on a document right now. We plan to be  
20 finished around mid-October to November time frame, so  
21 sometime this fall we'll have it approved for public  
22 comment.

23 We will issue it in the Federal Register,  
24 in a different Federal Register than the proposed  
25 rule, and it will have its own comment period. And we

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1 see this guidance document as supplementing existing  
2 guidance, so currently we have guidance in NUREG-1573,  
3 which is the recommendations of the Performance  
4 Assessment Working Group. And then, also, we have  
5 NUREG-1854, which provides guidance for performance  
6 assessment related to waste determinations.

7 So, we see this guidance document as kind  
8 of filling in the gaps with those guidance documents,  
9 but then also focusing on areas that are new, like  
10 intruder assessments, so we have detailed sections on  
11 the intruder assessment methodology, guidance on how  
12 to do that; risk-informed, performance-based, how to  
13 do -- use the period of performance in a risk-informed  
14 manner, how to do an analysis beyond the compliance  
15 period, we're calling that long-term analysis. How to  
16 do site's ability analysis after closure of the  
17 disposal site, and then also any special  
18 considerations for the blended waste source term.

19 So, that's kind of just my summary of how  
20 we got to where we are today. And then I can turn it  
21 over to Andy now.

22 MR. SMITH: I just want to announce that  
23 the webinar is up. And I'll provide the participation  
24 code again. It's 546376344. And for those who have  
25 just joined the call, just called in, I'm George

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1 Smith. I'm one of the Co-Facilitators for the meeting  
2 today. And, again, someone else just called in. The  
3 webinar information is 546376344. And we ask those  
4 who called in to make sure that your local bridge is  
5 on mute.

6 Okay. We'll turn it over to Andy now.

7 MR. CARRERA: Thank you, George. Thank  
8 you, Priya. Good morning, everyone, and welcome. My  
9 name is Andrew Carrera, and I work in the Office of  
10 Federal and State Materials and Environmental  
11 Management Programs in the Division of  
12 Intergovernmental Liaison of Rulemaking. I'm also the  
13 Project Manager for this Part 61 Site-Specific  
14 Analysis. I'll refer to it as the Part 61 Rulemaking  
15 for the duration of my presentation.

16 Today, we'll be providing you an overview  
17 of the Part 61 preliminary proposed rule language. As  
18 previously mentioned, the purpose of today's meeting  
19 is to inform the stakeholders of the current status of  
20 the proposed rulemaking, and to invite stakeholders'  
21 comments, or ask clarifying questions to formulate  
22 your written comments on the preliminary proposed rule  
23 language.

24 I'd like to reiterate that the NRC will  
25 review and consider any comments received today.

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1 However, the NRC will not formally respond or commit  
2 to any comments. The Statements of Consideration of  
3 the proposed rule may briefly discuss any substantial  
4 changes made to the proposed rule language as a result  
5 of comments received on this preliminary version  
6 today. Next slide, please.

7 So, with the Commission's direction to  
8 proceed forward with the Part 61 rulemaking as you've  
9 heard in the previous two presentations, an  
10 interdisciplinary rulemaking team was formed with  
11 representatives from across different offices within  
12 the NRC, as well as individuals who are representing  
13 both the Organization of Agreement States, and the  
14 CRCPD, and his name is Devane Clark from the great  
15 State of Texas. And I would like to thank my  
16 rulemaking team for your hard work and dedication.  
17 Next slide, please.

18 So, the rulemaking team proceeded to move  
19 forward in developing the objective and purposes of  
20 the rule to specify site-specific analysis  
21 requirements to demonstrate compliance with  
22 performance objectives in Part 61; and to strengthen  
23 and clarify existing regulation to facilitate  
24 implementation and to better align requirements with  
25 the current health and safety standards. Next slide,

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1 please.

2 And to achieve the objectives and  
3 purposes, the rulemaking team proposed the following  
4 approaches to the Part 61 rulemaking, and that is, it  
5 has to be waste stream neutral, and it should contain  
6 requirements for site-specific analysis.

7 Now, when they developed Part 61  
8 regulation, the NRC considered potential doses to  
9 offsite members of the public and inadvertent intruder  
10 based on certain assumptions regarding the waste  
11 stream likely to be found in the commercial low-level  
12 waste disposal facility. And large quantities of  
13 depleted uranium, blended waste, and other waste  
14 streams were not included in the technical basis,  
15 because they were not expected to be a major waste  
16 stream for Part 61 facilities.

17 But numbers of these waste stream have  
18 become candidates, as Priya has mentioned before, for  
19 disposal at low-level waste disposal facilities. And  
20 the amendment proposed in this rulemaking will require  
21 licensees to consider this new waste stream, and will  
22 continue to insure that Part 61 performance objectives  
23 are met.

24 The rulemaking team considered a number of  
25 options in developing this proposed rule. In the end,

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1 the rulemaking team decided that an amendment that  
2 requires additional site-specific analysis for all of  
3 the radionuclides that were not considered in the  
4 development of Part 61 would be the most comprehensive  
5 approach; and, hence, it's a waste stream neutral  
6 approach.

7 The site-specific analysis, the NRC also  
8 proposed amendment to Part 61 that would require low-  
9 level waste disposal facilities to conduct site-  
10 specific analysis to demonstrate compliance with  
11 performance objectives in Part 61, which would enhance  
12 safe disposal of low-level waste. And these analyses  
13 will also identify any additional measures that would  
14 be prudent to implement. And the site-specific  
15 analysis performance assessment would be added to  
16 Section 61.41, Intruder Assessment, which will be  
17 added to Section 61.42, a new long-term analysis  
18 requirement which would be added to a new proposed  
19 Section 61.13(e), an updated analysis at facility  
20 closure which would be revised and added to Section  
21 61.28 and 61.52.

22 In addition, the NRC proposed other  
23 amendments to current Part 61 regulations to reduce  
24 ambiguity, facilitate implementation, and to better  
25 align requirements for the current health and safety

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1 standards. These include new definition and concepts,  
2 as well as the use of total effective dose equivalent  
3 or TEDE. Next slide, please.

4 Now, in the interest of time, I'll briefly  
5 go over the changes in the preliminary proposed rule  
6 language. Please note that the proposed text are in  
7 bold font; however, it's kind of difficult to see it  
8 here. I should have underlined it just to set it out a  
9 little bit. However, I do have part of the briefing  
10 presentation handout, a copy of the ~~strikeout~~ and  
11 underline preliminary proposed rule language,  
12 ~~strikeout~~ that old text and underline the newly added  
13 proposed text. So, it's there for your reference, and  
14 I will also put this on ADAMS in case you need it  
15 later on, so you can look for it.

16 In site-specific analysis performance  
17 assessment, Part 61 currently requires the licensee  
18 and license applicants to prepare an analysis to  
19 demonstrate that low-level waste disposal facility  
20 meets the requirement in Section 61.41, which insures  
21 the protection of general population from the releases  
22 of radioactivity.

23 This analysis is called Technical Analysis  
24 instead of a performance assessment, and does not  
25 contain period of performance associated with the

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1 analysis. And the current Part 61.41 exists as a  
2 single paragraph, and the proposed rule would split  
3 the section into two subparagraphs, A and B. Specific  
4 requirements for performance assessment would be added  
5 to Subparagraph A, and specification for period of  
6 performance to estimate peak annual dose up to 20,000  
7 years would be added to Subparagraph B. This  
8 Subparagraph B are new text, and 25 millirem total  
9 effective dose would be new text in this case, as  
10 well. Next slide, please.

11 For intruder assessment, Part 61  
12 currently does not require a licensee to perform  
13 intruder dose assessment to demonstrate the compliance  
14 with Section 61.42 performance objective for the  
15 protection of inadvertent intruder.

16 Unlike requirements in Section 61.41,  
17 which addresses protection of general population from  
18 releases of radioactivity, no specific dose limit is  
19 set in the performance objectives for technical  
20 requirement for protection of an inadvertent intruder.

21 Instead, the safety of an inadvertent intruder is  
22 insured by the waste classification system, and the  
23 disposal requirement imposed for each waste class.

24 The current Section 61.42, also it's a  
25 single paragraph, and the proposed rule would split

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1 the paragraph into two subsections, A and B. And  
2 specific requirement for a license refer intruder  
3 assessment with annual dose limit of 500 millirem TEDE  
4 would be added to Subparagraph A. And this would be  
5 new language right here. And specification for a  
6 period of performance to estimate peak annual dose up  
7 to 20,000 years would be added to Subparagraph B. And  
8 Subparagraph B are all new text. Next slide, please.

9 Also, intruder assessment, we also --- a  
10 proposed rule would require intruder assessments for  
11 Section 61.55(a)(6) waste, as well. And the last  
12 sentence of this 1.55(a)(6) waste paragraph are new  
13 text. Next slide, please.

14 Site-specific analysis, long-term  
15 analysis. The NRC has determined that it would be  
16 prudent to require additional long-term analysis to  
17 insure that the waste streams significantly different  
18 from those considered in Part 61 Technical Basis can  
19 be disposed of while still meeting the Subpart C  
20 performance objectives.

21 The proposed long-term analysis, which  
22 will be added to an all new Section 61.13(e)(1) and  
23 (e)(2), will consider uncertainties associated with  
24 the disposal of long-lived low-level waste streams,  
25 and is needed to determine whether limitation on the

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1 disposal of the waste streams at certain sites may be  
2 needed to properly manage the disposal.

3 This analysis will be required to consider  
4 peak annual dose that occur 20,000 years or more after  
5 site closure. No dose limit would apply to these sort  
6 of analysis. The analysis will need to be included as  
7 an indication of the long-term performance of the land  
8 disposal facility. I mentioned before, these are all  
9 new text, proposed text. Next slide, please.

10 Updated analysis. Section 61.28 requires  
11 licensee to submit an application for amendment  
12 license for closure, and this application must include  
13 a final revision, and specific details of the disposal  
14 site closure plan. And Section 61.52 imposed  
15 requirements for disposal facility operation and site  
16 closure.

17 In the current, Section 61.28 and 61.52 do  
18 not have requirement for updated site-specific  
19 analysis. The updated site-specific analysis  
20 requirement is needed to provide greater assurance of  
21 compliance with performance objectives of Subpart C,  
22 and to enhance the safe disposal of low-level waste.

23 The updated site-specific analysis would  
24 allow a regulatory agency to determine whether site  
25 and design meets Subpart C performance objectives.

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1 And the new text in 61.28(a)(2) would be the last --  
2 part of the last sentence. And 61.52(a)(12) would be  
3 an all new subparagraph. Next slide, please.

4 Other supporting changes. The NRC also  
5 proposed additional amendments to current Part 61  
6 regulation to facilitate implementation. These  
7 supporting changes include definitions of intruder  
8 assessment. Next slide, please.

9 Definition of long-lived waste, and  
10 performance assessment. And these definitions will  
11 serve to insure consistency in the application of the  
12 objectives of the proposed rule. And all these  
13 definitions are new definitions. Next slide, please.

14 Section 61.7 concept. Other supporting  
15 changes also include providing clarification to the  
16 current concept of disposal facility. New language to  
17 Section 61.7(a)(1) was added to affirm the alternative  
18 methods of disposal can be approved on a case-by-case  
19 basis, and meet it. And that's conveyed in the last  
20 sentence of the proposed Section 61.7(a).

21 Next slide, please.

22 Also in Section 61.7 Concepts, new  
23 section, Section 61.7(b) was added to convey the  
24 concept of performance assessment. Subparagraph 1  
25 captures the features, events, and processes that can

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1 improve the function of the waste disposal facility.  
2 And Subparagraph 2 captures key technical parameters  
3 to be evaluated in a performance assessment. And  
4 these are new proposed text. Next slide, please.

5 Also, in Section 61.7, in (c)(2), the  
6 concept like stability of long-lived waste may be more  
7 uncertain and require more robust technical evaluation  
8 was added to Paragraph (c)(2). And the new text will  
9 start from here, as well as in (c)(5). Next slide,  
10 please.

11 Also, in Section 61.7, Concept, new  
12 Paragraph (c)(6) was added to capture the concept of  
13 enhanced control for limitation at a particular land  
14 disposal facility to provide reasonable assurance that  
15 waste will not present an unacceptable hazard over the  
16 compliance period. And 61.7(c)(6) are all new  
17 proposed text. Next slide, please.

18 61.7(c)(7), this is a new paragraph, and  
19 it was added to convey the concept of intruder  
20 assessment, and captures key technical parameters to  
21 be evaluated in this assessment. And, like I  
22 mentioned, it's all new text, as well. Next slide,  
23 please.

24 Other supporting changes to Section 61.13  
25 would include additional information to Paragraph A on

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1 the technical analysis of performance assessment that  
2 captures key technical parameters to be evaluated in a  
3 performance assessment. And previously, we do have  
4 61.13(a); however, these new text were added to that  
5 section, and the old text would be started from here.

6 Next slide, please.

7 In Paragraph B on the technical analysis  
8 of an intruder assessment captures the dose limit set  
9 forth in Section 61.42. And new text will start from  
10 here and down. Next slide, please.

11 So, Priya mentioned regulatory basis stage  
12 where we solicit public comments at two public  
13 meetings and develop a regulatory basis. We are now  
14 in the proposed rulemaking stage, and today's meeting  
15 -- as Larry mentioned, today's meeting is for enhanced  
16 public participation.

17 The stakeholders will also have another  
18 opportunity to comment on this proposed rule language  
19 when it's formally published as a proposed rule in  
20 accordance with the provisions of the Administrative  
21 Procedure Act. And the NRC will formally respond to  
22 any of those comments in a Statement of Consideration  
23 in the final rule. And the next step would be the  
24 final rule, which would take about a year after  
25 publication of a proposed rule.

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1           And that concludes my presentation on the  
2 changes of preliminary proposed rule language, and I  
3 thank you for your time. I look forward to receive  
4 your comments, or answer any clarifying questions that  
5 you may have in this afternoon's session. Thank you.

6           DR. ESH: Good morning all of you. I'm  
7 pleased to see all of you here, and that you've taken  
8 the time to come and give us some feedback. And all  
9 of you, it sounds like go to meetings up and running  
10 now, and I think that's a very great technology to get  
11 more involvement in the things that we're doing.

12           I'm David Esh. I work in the Performance  
13 Assessment Branch of the Division of Waste Management  
14 and Environmental Protection, and I'm going to talk  
15 today about the proposed period of performance for  
16 low-level waste disposal.

17           The terminology, there's different  
18 terminology that's been used, the period of  
19 performance, time of compliance, compliance period,  
20 performance period, it's all kind of used  
21 interchangeably in the literature. I'm going to use  
22 period of performance, but in the end when we get to  
23 our recommendation I'll explain what we mean by  
24 different phases of the approach we're recommending.  
25 Next slide, please.

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1 I believe most of the information on this  
2 slide was covered by Priya and Andy. The main thing  
3 I'd like to point out is the middle bullet, the public  
4 workshops in 2009. And we heard during those  
5 workshops very clearly that people thought we should  
6 specify a period of performance in the regulations.  
7 So, that's what we went about doing, and that's what  
8 I'm going to hopefully give you a lot of detail on  
9 today to help you formulate your comments when the  
10 proposed materials come out this fall. All right.  
11 Next slide, please.

12 The period of performance is one many  
13 important elements in a safety evaluation of low-level  
14 waste, but not the only one. A lot is involved in the  
15 regulation, and a lot is involved in determining  
16 whether low-level waste disposal can be done safely.

17 In the U.S., different approaches are  
18 used, and also internationally. Right now, all of our  
19 commercial low-level waste disposal occurs in  
20 Agreement States. The regulation does not specify a  
21 period of performance, so there's flexibility in  
22 interpreting what period of performance, or compliance  
23 period you should assign in the analysis.

24 We have very diverse views among  
25 stakeholders, both within NRC and external to NRC. I

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1 went back to the transcripts that we had from the  
2 meetings in 2009, and tried to classify the views that  
3 were expressed in there, and they truly are very  
4 diverse. They span a very broad range.

5 We had opinions expressed from 10,000  
6 years is ridiculously too long, to the only thing that  
7 you can do is go to peak dose, which in the case of a  
8 material like depleted uranium, might be a couple of  
9 million years. And then probably if you wanted to say  
10 what was the most likely response, the most likely  
11 response was a non-response, so non-committal was  
12 probably the most likely response you saw in those  
13 transcripts. Next slide, please.

14 Some background from NRC. We have talked  
15 about this subject within NRC, and some of our  
16 stakeholders since as early as 1994. Originally, most  
17 of that discussion was done in the context of our  
18 high-level waste program. Our Advisory Committee on  
19 Nuclear Waste discussed the period of performance on  
20 numerous occasions for what you may do for high-level  
21 waste.

22 Remember around that time, the National  
23 Academy of Sciences was looking at the issue, and they  
24 -- a report from them came out, so there was kind of a  
25 heightened period of activity around period of

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1 performance. And they, basically, said for geologic  
2 disposal, you don't have a strong reason for cutting  
3 off the period of performance at some period of time,  
4 such as 10,000 years that was proposed at the time.

5 There's no reason why for a geologic system that has  
6 some inherent stability to it you can't evaluate  
7 longer periods of time.

8 So, ultimately, what happened is in high-  
9 level waste space, for Yucca Mountain, specifically,  
10 not for Part 60 which applies to any geologic disposal  
11 of waste, but for Part 63, the disposal of high-level  
12 waste at Yucca Mountain, they ended up with,  
13 basically, a two-phase compliance period. So, a  
14 10,000-year period, followed by up to a million year  
15 period, and two different dose limits for those two  
16 periods.

17 The Commission has given us direction, as  
18 far as I can tell, only in SRM-96-103, where at the  
19 time we had a Performance Assessment Working Group  
20 referenced in the bottom bullet that was looking at  
21 this issue, and also providing overall guidance on how  
22 to do performance assessment for low-level waste  
23 disposal. And they had discussed a 10,000-year period  
24 for period of performance, or a 10,000-year compliance  
25 period.

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1           The Commission, at that time, said, okay,  
2 provide a basis, if you want to use 10,000 years,  
3 provide a basis for stopping the analysis there. And  
4 then there was a follow-up SECY Paper in 2000 where  
5 the staff said we're not recommending to cut it off.  
6 But then in NUREG-1573 they kind of did that, not  
7 totally, but they, basically, analyzed, they developed  
8 the test case simulations, and analyzed low-level  
9 waste disposal, and they said okay, if we look at most  
10 low-level waste disposal, it's dominated by short-  
11 lived activity, and some long-lived activity.

12           If you set a 10,000-year compliance  
13 period, that's going to capture all of the short-lived  
14 activity that's essentially going to decay over that  
15 period. And it's going to capture the more mobile  
16 long-lived activity.

17           They did note that there are some things  
18 that would stress that position, and one of those  
19 things was something like large quantities of  
20 uranium, or depleted uranium, because it has  
21 characteristics that are a little different, or a lot  
22 different than traditional low-level waste.

23           So, what they ended up recommending for  
24 that type of a material was to consider those long-  
25 term impacts, but to put them in something like a Site

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1 Environmental Assessment, where they can be better  
2 judged in the overall context of the problem. Next  
3 slide, please.

4 So, the general objectives that we sought  
5 out to accomplish in our work was, we wanted to  
6 provide protection to the present and future  
7 generations. And the rub becomes how you define  
8 protection of the future generations. Is that only  
9 achieved by setting a dose limit similar to the  
10 present generation, and extending that in perpetuity  
11 consistent with the waste characteristics, or can you  
12 achieve that in other ways, or should you achieve that  
13 in other ways?

14 We also wanted to look at uncertainties,  
15 and how uncertainties come into play, because the  
16 uncertainties are diverse, and can be quite large. We  
17 felt it was essential that longer term impacts are  
18 communicated in whatever mechanism that may be.

19 It's one thing to say well, we're going to  
20 evaluate our low-level waste, and we have a compliance  
21 period, but if there are things that extend out beyond  
22 that compliance period, I think it's important to  
23 communicate what those impacts may be to the best of  
24 your ability to your stakeholders. And there's no  
25 reason why this decision making process has to be

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1 easy. You know, the decision makers might have  
2 uncertain information, and they might have information  
3 that's a little challenging to communicate to their  
4 stakeholders, but there's no reason it has to be easy.

5 Ultimately, we do want to facilitate the  
6 decision making process, because something that we  
7 recommend that doesn't facilitate the decision making  
8 process isn't going to be of much value.

9 Over long periods of time, all of these  
10 considerations can be very complex, especially this  
11 protection of the future generations. But there is a  
12 bit of a misconception, I would say, that the  
13 performance assessment is making the decision. The  
14 performance assessment is not making the decision.  
15 The performance assessment is a tool to provide  
16 information to the decision makers.

17 And I think the IAEA takes this approach  
18 in their definition of a safety case. The safety case  
19 has many elements to it, of which one of it is this  
20 technical analysis that you perform. So, don't get  
21 lost in the weeds that the performance assessment is  
22 telling me to do X, Y, and Z, and the criteria,  
23 especially the period of compliance, is the bottom  
24 line to whether I can do this or not. It's not. It's  
25 information that you're generating for the process

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1 that the decision makers should use. Next slide,  
2 please.

3 I apologize. I let an acronym slip  
4 through here. I don't like acronyms, but that's  
5 Period of Performance Selection Process. So, we did a  
6 literature review. We look in the U.S. and  
7 internationally, and tried to see what do people  
8 consider when they're trying to identify and select a  
9 period of performance. And the items that I have  
10 listed here are pretty much the scope of what people  
11 consider.

12 The characteristics of the waste, which in  
13 the case of low-level waste, and I'll show on the next  
14 slide, is very diverse. And that creates a challenge.

15 The analysis framework is an important component, so  
16 in low-level waste disposal it's not just how you've  
17 selected and defined the period of performance, but  
18 how that fits into your overall framework for insuring  
19 safety. And there are many elements to that framework  
20 for insuring safety, from site characterization, to  
21 monitoring, to institutional control of the facility.  
22 It has many elements, not just a technical analysis of  
23 the projected future impacts.

24 Uncertainties, I think, are very important  
25 to talk about. In performance assessment space, or

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1 technical analysis space, we generally focus on the  
2 middle two here, natural and engineering. But there  
3 are also over long periods of time these other two  
4 sources of uncertainty, societal and technology. And  
5 I have a conceptual figure I'll talk about in a few  
6 slides here that just tries to get you thinking about  
7 all these sources of uncertainty, and how they may  
8 affect your problem.

9 And, ultimately, over long periods of  
10 time, the problem becomes strongly impacted by socio-  
11 economic considerations, so these are things like  
12 transgenerational equity, and discounting, especially  
13 discounting over long periods of time.

14 One thing that we hear when we've  
15 discussed this with stakeholders is, some stakeholders  
16 will express the opinion well, uncertainties are so  
17 large you should pick a short compliance period. And,  
18 for me, that argument doesn't fly. I mean, if you  
19 think about in your life and risks that you may have  
20 in your life, I doubt that you're saying I'm going to  
21 take Action X because I have large uncertainty, or I'm  
22 going to take a risk because I have uncertainty.

23 In most cases, you want to reduce the  
24 uncertainty, and make sure that you can manage that  
25 risk. And, in this case, we also have to remember

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1 where we are. Low-level waste is at the top of the  
2 waste management pyramid or spectrum. Material that  
3 can't safely be disposed of as low-level waste has  
4 other options. They can be disposed of in a facility  
5 that would take greater than Class C waste, or high-  
6 level waste if those facilities, hopefully, get  
7 developed some day.

8 It can also be disposed of in a more  
9 advanced design of a low-level waste facility.  
10 Existing facilities might not be able to handle  
11 certain types of materials. That doesn't mean that  
12 you can't design a facility to handle the material.  
13 So, try to remember the context of where we are, where  
14 low-level waste is in this waste management spectrum  
15 that we have. Next slide, please.

16 So, some waste characteristics. It's  
17 important, but it's only one element to the problem.  
18 If we look at the figure on the left, we have activity  
19 ratio of traditional commercial low-level waste, and  
20 this was using some data from Barnwell. And then we  
21 have the activity ratio of, in this case, depleted  
22 uranium, or one type of waste that may stress the  
23 system.

24 Commercial low-level waste, the activity  
25 drops off very rapidly, and by 1,000 years, you maybe

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1 have a few tenths of a percent of the activity  
2 remaining. For something like depleted uranium,  
3 concentrated depleted uranium, the activity ratio  
4 stays pretty flat with what you put in, and then you  
5 get the daughters coming in at much later times, and  
6 activity doesn't peak until after a million years.

7 So, you look at this and you say well, how  
8 would I set a period of performance for low-level  
9 waste? Well, if I have low-level waste that's like  
10 the thick curve, the traditional commercial low-level  
11 waste, I could argue that yes, maybe at 1,000 years,  
12 or a few thousand years, you're pretty comfortable  
13 that you've captured most of the risk. Whereas, for  
14 something that has this long-lived behavior, and  
15 ingrowth of some daughter products that tend to be  
16 maybe more mobile than the parent, then you're really  
17 stressing the system to say okay, what are the -- how  
18 do I handle these impacts that may be occurring at  
19 very later times?

20 On the right hand, what I've done is --  
21 the lefthand figure is log-log. The right-hand  
22 figure is for radium-226 ingrowth, and it's linear-  
23 linear, just to show you the differences in the curve.  
24 So, the log-log curve may give you a different  
25 perspective than when you look at the linear graph.

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1           So, if we're talking about 10,000 years,  
2 that's way down here at the very beginning of the  
3 curves when you're talking about like radium-226  
4 ingrowth. Next slide, please.

5           So, this is a figure that we generated in  
6 the period of performance paper to try to communicate  
7 some concepts about uncertainty. It's only conceptual  
8 in nature. It's not quantitative, but it is trying to  
9 talk about different sources of uncertainty, and have  
10 you think about those as stakeholders.

11           So, we broadly classified the uncertainty  
12 on three different types here. We have societal  
13 uncertainty, which is technology scenarios,  
14 activities, those sorts of things. We have natural  
15 sources of uncertainty, which is, basically, the  
16 behavior of your natural system and how it may evolve  
17 over time. And then we have engineered components  
18 that may be used.

19           So, if we look at say, the engineered  
20 components, what we're trying to convey is, well --  
21 and this is based on our experience of looking --  
22 reviewing performance assessments, and evaluating  
23 complex decommissioning sites, and it's kind of a  
24 synthesis of our experience, or how we generally  
25 understand uncertainties.

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1           And the relative uncertainty here is just  
2 classified as small, medium, and large. And it  
3 doesn't mean that the uncertainty is favorable or  
4 unfavorable to the objective you may be trying to  
5 achieve. It just means that it's large. Okay? So,  
6 large means that it could influence the results in  
7 either direction by a significant amount.

8           So, an engineering uncertainty, there's  
9 uncertainty in the initial as-built conditions.  
10 Engineers are good at designing things, but you have  
11 to be careful that they have adequate quality  
12 assurance and quality control, that they've built what  
13 they intended to. And they have processes to verify  
14 what they've built that they have intended to.

15           Once you get over that, okay, we have  
16 built what we intended to, over the short time of tens  
17 to maybe a few hundreds, depending on the engineered  
18 system, we have an experience-base, and I'd say  
19 relatively well understood degradation mechanisms that  
20 our uncertainty, or relative uncertainty, I think,  
21 goes down to some extent. But as you extend out into  
22 longer time frames, we maybe have some analogs for  
23 some engineered systems, but we're really getting into  
24 limited to no experience-base when you extend beyond  
25 1,000 years, or many thousand years for how the

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1 engineered systems may behave.

2           Eventually, when you don't have any more  
3 credit for your engineered system, the uncertainty is  
4 low. It's not impacting the results of the problem  
5 any more. So, you have -- for something like  
6 engineering, you have this kind of complex shape to  
7 how the uncertainty may change over time.

8           The same thing goes for say natural  
9 systems. Natural systems we have, I'd say, higher  
10 uncertainty than engineered systems over our like  
11 generation or lifetime time frames, because they're  
12 more difficult to understand. They have inherent  
13 variability in them. They're more difficult to  
14 characterize. But the behavior over short periods of  
15 time, and this is in a low-level waste disposal  
16 context, is relatively stable.

17           But as you move out beyond 1,000 years,  
18 especially tens of thousands of years, now you're  
19 talking about natural cycling of climate, landform  
20 evolution, surface geological processes, uncertainties  
21 start increasing, and may become very large at some  
22 sites. And then when you go out to very long periods  
23 of time, you're talking about extreme natural events,  
24 mountain uplift, and volcanic activity, and all the  
25 things of building continents, and even something like

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1 say meteorite impact. That becomes a real risk, and a  
2 real uncertainty when you go out to -- when you're  
3 starting to talk about hundreds of thousands of years.

4 The one that we don't explicitly deal  
5 with, or represent in most technical analyses,  
6 including performance assessments, is the green curve  
7 here with the technology scenarios and activities.  
8 And I would submit that if you think about how things  
9 have changed over time, that that can be a very large  
10 and dramatic influence, a very large and dramatic  
11 uncertainty. So, if you take something like radon,  
12 radon was discovered about 100 years ago. And now,  
13 when you buy a house it is required in some places,  
14 but it isn't required everywhere, but you can have  
15 your house tested, determine how much radon is there,  
16 and have mitigation completed to try to limit the  
17 impacts of radon in your home.

18 That, if you are trying to say well,  
19 what's the impact of radon to a future generation?  
20 Well, it wasn't even identified 100 years ago, and how  
21 big of a risk is it to people 200 years from now? If  
22 you look at how the technology has changed over just  
23 100 years with identifying it, mitigating it, it's  
24 been a dramatic effect.

25 I think that you can't rely on how

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1 technology is going to evolve, but this technology --  
2 the impact of technology, and how that impacts life  
3 is real. So, if you say well, technology may evolve -  
4 - technology may become stagnant, or we may go through  
5 a period where society decays, and technology  
6 decreases. Well, then you're in a situation where the  
7 relative impact from waste disposal starts being  
8 affected by, or when you consider it to the magnitude  
9 of the other things that are going on, it decreases in  
10 significance. And I'll talk about that in a slide or  
11 two here. Next slide, please.

12 So, if we look at one component of the  
13 uncertainty, and how people thought about how to deal  
14 with it, socio-economic considerations, the National  
15 Academy of Public Administration recognized that  
16 inter-generational decision making involves a number  
17 of variables. And I've listed these variables here.

18 NRC hasn't formally adopted these  
19 variables, but in the Period of Performance paper, we  
20 modified them slightly, and stated something that we  
21 think is reasonable to consider for low-level waste.

22 These principles, some of them may seem  
23 straightforward, but when you go to implement and  
24 develop, say regulatory criteria, they're not at all  
25 straightforward. So, take like Item 3. "Each

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1 generation has a primary obligation to provide for the  
2 needs of the living and succeeding generations, and  
3 near-term concrete hazards have priority over long-  
4 term hypothetical hazards."

5 Well, in low-level waste disposal, because  
6 of uncertainty, I think we do very well with the near-  
7 term concrete hazards. I'm not aware of health effects  
8 that have happened to people from low-level waste  
9 disposal. And the cost needed to deal with the long-  
10 term hypothetical hazards can cost resources, whether  
11 it's regulatory review, development of guidance,  
12 licensee's cost for developing information and  
13 assessing it can become much larger than what's needed  
14 for the near-term concrete hazards. So, you have to  
15 ask yourself, is that in alignment with this number 3  
16 principle, or not?

17 And then there's also the Law of  
18 Unintended Consequences can apply for these types of  
19 problems. So, some things that you may do in the near  
20 term that benefit the near term, or that you may do to  
21 try to mitigate something over the long term can have  
22 an unintended consequence on a different or succeeding  
23 generation.

24 So, the bottom line is that I think when  
25 you take these principles, and you try to extrapolate

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1 them, or interpolate them into a policy, it is not  
2 straightforward, and there are complicated  
3 considerations that come into play.

4 We also talked about discounting in our  
5 paper, and how you may consider that, because NRC has  
6 a policy expressed in, I think it's NUREG-1530, \$2,000  
7 per person rem for looking at changes to regulatory  
8 requirements.

9 If you include -- if you consider  
10 discounting over very long periods of time for, say,  
11 waste disposal, what that would mean is that you  
12 should spend very little today to protect the future  
13 generations. The opportunity cost of those resources  
14 that you spend today, they're taken away from some  
15 other action that can have a direct impact on society.

16 So, money is not free, and it's not unlimited, and  
17 when you're talking about long-term impacts, you have  
18 to think about well, how does this cost or burden that  
19 I'm imposing today translate into how a future  
20 generation may want to use those resources?

21 We do acknowledge that discounting is  
22 based on some unstated economic assumptions that may  
23 not apply over very long periods of time. But, as I  
24 talked about earlier, when you're in that situation  
25 and you say well, we can have a period of time where

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1 the discount rate goes negative for a long period of  
2 time; well, society is having big problems if that  
3 happens. And the risk that they're faced with -- a  
4 risk that we're faced with today, saying trying to  
5 manage low-level waste disposal can get swamped by  
6 some of the other risks that society will be faced  
7 with in that situation. So, there's kind of a natural  
8 negative feedback built into a consideration of  
9 discounting for waste disposal. Next slide, please.

10 So, options that we considered. We  
11 considered four options, or five options, I'm sorry.  
12 We started with no change from the current approach,  
13 so that would be the period of performance is  
14 undefined in the regulation. The second option we  
15 considered was peak dose, whenever that may occur.  
16 The third option that we had was a regulatory  
17 precedent, and I'll describe that as two tiers. And  
18 what that means is, two different parts to the  
19 evaluation that have different expectations or  
20 criteria applied to them.

21 Now, I think you could maybe say that both  
22 number one and number two are a one-tier approach, so  
23 no change. You do a compliance period. You stop,  
24 don't worry about what happens after the compliance  
25 period. I'd say that's a one-tier analyses. You just

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1 have one tier to it. Peak dose, same thing. It's just  
2 the tier is a lot longer. The tier is, you include  
3 everything in the evaluation.

4 The fourth tier, or the fourth option that  
5 we developed was uncertainty-informed approach, which  
6 we developed three tiers for. We call them a  
7 compliance assessment and performance period. That we  
8 were trying to align the analysis expectations with  
9 the uncertainties in the problem.

10 And then the fifth option we considered  
11 was an industrial metals approach, so that's kind of  
12 what's done under say EPA with disposal of industrial  
13 metals. Next slide, please.

14 Now, selection of period of performance is  
15 fairly or very subjective, but we wanted to try to, at  
16 least, be a little more objective about how we would  
17 evaluate these options, and what we would recommend.  
18 So, we developed some rating factors to try to rank  
19 the various options, and recommend one of them.

20 The rating factors that we developed were  
21 protectiveness of public health and safety,  
22 consistency with inter-generational principles,  
23 consistency with current NRC policy, treatment of  
24 uncertainty, and then facilitate regulatory decision  
25 making. And those are -- the order of them is

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1 somewhat significant. The protectiveness of public  
2 health and safety is given higher weight than, say  
3 facilitate regulatory decision making. Like I said  
4 earlier, there's no reason that the decision has to be  
5 easy, but we do need to make sure that we believe  
6 public health and safety is provided. Next slide,  
7 please.

8 So, the rating factors for the various  
9 options, and how we assigned a value to them, or range  
10 of values. Some of them we felt we couldn't justify  
11 just a single value. So, if we take like the current  
12 approach, Option 1, facilitate regulatory decision  
13 making, that could be low to high depending on how you  
14 define your compliance period. Some compliance  
15 periods, if you set it very short, you could say well,  
16 that facilitates my regulatory decision making,  
17 because it may make the problems seem to be easier.  
18 Or if I set it very, very long, I could introduce a  
19 lot of technical challenges that people may not have  
20 information to deal with, and that could make  
21 regulatory decision making more difficult.

22 (Background noise.)

23 DR. ESH: Please put your phone on mute if  
24 you're connected through the teleconference.

25 Ultimately, we kind of classified all of

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1 our options, and the option that we recommended was  
2 Option 3. And we believe, as we've defined it, it's  
3 medium to high. The treatment of uncertainty would be  
4 low. If we chose regulatory precedent with no or  
5 limiting consideration of the long-term impacts, but  
6 we felt that as we -- in the form that we recommended  
7 it, it's medium to high of all of our rating factors.

8 Next slide, please.

9 So, Option 3 is the regulatory precedent,  
10 this two-tiered approach with the elements  
11 specifically selected for the problem. And that's  
12 where I'll talk about in a couple of slides here a  
13 basis for how we've defined our period of performance.

14 We felt it provided the best balance  
15 considering all the factors, and the stakeholders  
16 views at the current time. We also talked about what -  
17 - Option 4, the compliance assessment and performance  
18 approach, or a three-tiered approach. And if we say  
19 right now we're completely flexible, and the period of  
20 performance is undefined, and then we go to something  
21 like an Option 4, which has three tiers, and you'd  
22 have to specify the boundary of each tier, and the  
23 limit for each tier, that's a big change. That's a  
24 lot of detail that maybe we aren't ready for. But  
25 we'll get your feedback on it, and hear from our

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1 stakeholders.

2           These regulations are not static, they're  
3 dynamic. And we adjust as we need to. And if we feel  
4 like in say our comprehensive rulemaking activity, if  
5 budgeted and implemented in the future, that there's -  
6 - we had enough view from stakeholders to reexamine  
7 say this aspect of the problem, we can reexamine it.  
8 But right now, we're recommending Option 3, regulatory  
9 precedent. Next slide, please.

10           So, the two tiers. The first tier is a  
11 compliance period, and this is -- the language is the  
12 language from the Period of Performance paper, which  
13 differs from the regulatory text, because this was an  
14 input to the rulemaking text development process.

15           The first tier is a compliance period of  
16 no less than 20,000 years with a peak annual dose of  
17 25 millirem TEDE. The second tier is okay, what do you  
18 do with this after 20,000 year effects, if there are  
19 any? Well, what we recommend is a requirement to  
20 perform a calculation of the peak annual dose that  
21 occurs after 20,000 years as an indicator of long-term  
22 performance, but no dose limit would apply to this  
23 analyses. We also recommend a requirement to provide  
24 analyses that demonstrate how the facility was  
25 designed to mitigate long-term impacts.

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1           This approach is in very strong agreement  
2 with what was recommended by the ACNW that expressed  
3 principles of how you would go about setting a time of  
4 compliance, or period of performance for low-level  
5 waste disposal. And they were very concerned that you  
6 were -- for the long-term impacts, and say things that  
7 we're including in tier two, that it doesn't become a  
8 de facto compliance period, because you're maybe  
9 kidding yourself, and you're maybe -- could be  
10 considered to be misleading for some of your  
11 stakeholders if you're trying to argue that you have  
12 proof of what the number is at those very long times.

13         The best you can probably do is say, here's what I  
14 expect to happen, here are some alternatives, here are  
15 the range of impacts that I can expect over those  
16 times.

17           Decision maker gets that information, and  
18 decides okay, is this a good decision to make, or not?

19         And I think what we've expressed with our two-tier  
20 approach, a second tier would provide transparency of  
21 information. And, ultimately, we really want to  
22 insure that stakeholders are given transparency of the  
23 information if the long-term impacts apply in a  
24 particular application.

25           As I said, most sites and most facilities

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1 aren't going to be in this boat, but some of them may.

2 The ones that are in this boat, we want transparency  
3 of information. And as I'll show on the next, let's  
4 see, three, four slides from now, we're still  
5 providing some flexibility.

6 We also made changes, as Andrew  
7 highlighted, to the regulation to highlight  
8 uncertainties associated with disposing of long-lived  
9 waste. And the limitations on the disposal of those  
10 materials may be needed to properly manage the  
11 uncertainties.

12 The performance assessment should be used  
13 to identify both, can I dispose of certain material,  
14 and what are my limitations? So, the performance  
15 assessment can identify what I can't take, and that's  
16 an important input to the decision makers and the  
17 stakeholders. And it may be that your performance  
18 assessment can be used to identify, I need to set some  
19 limitations on what I can take. That would be an  
20 appropriate use of a performance assessment,  
21 especially for the long-term impacts. Next slide,  
22 please.

23 So, what is the basis for our 20,000  
24 years? Well, we looked at a number of different  
25 things. One of the primary things we looked at is

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1 stability. So, in Part 61, it says, "A cornerstone of  
2 disposal is stability," and we agree with that  
3 totally. Near-surface disposal, as you go out in  
4 time, you start running into some very strong  
5 stability issues. And they're much more challenging  
6 than, say, for geologic disposal.

7 So, some of the discussion we had  
8 internally is well, if we wanted to recommend the  
9 longer value for, say, long-lived low-level waste, how  
10 would that be -- how could you explain that for what's  
11 done for, say, high-level waste, or WIPP, for  
12 instance, the Waste Isolation Pilot Plant.

13 Well, in both of those cases, they looked  
14 at geologic disposal, and they made the argument that  
15 if those sites are stable for 10,000 years, they're  
16 likely to be stable for much longer. So, a 10,000-  
17 year period, if it's consistent with the waste  
18 characteristics, is sufficient for the geologic  
19 disposal system.

20 Now, ultimately, as I stated, in Yucca  
21 Mountain they ended up with a second phase to that  
22 compliance period, and a higher dose limit. But at  
23 WIPP, they have a 10,000-year, I'm not sure if they  
24 call it a time of compliance, or evaluation period, or  
25 what, but they have a 10,000-year assessment period.

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1 For near-surface disposal where you start  
2 dealing with natural cycling on the climate. So,  
3 right now we're in a warm phase, interglacial. And  
4 those interglacial periods have lasted from five to  
5 twenty thousand years or so based on the history of  
6 Paleo climate studies, and all sorts of information  
7 that has been developed to try to understand how our  
8 planet has changed over time.

9 A big part of that cycling of climate is  
10 determined by planetary motion, so precession of the  
11 earth, and rotation, and movement of the planets  
12 around the sun, and there's a pretty strong like  
13 100,000-year period that changes our climate, and then  
14 a shorter period within that also affects the climate.

15 And right now, we're in the middle of the warm stage.

16 It started anywhere from 10, to 14, to 12,000 years  
17 ago, something like that.

18 One of our concerns was that if we  
19 specified a 10,000-year period of performance for low-  
20 level waste, we'd be right in this transition period.

21 And that doesn't seem to make much sense. Either you  
22 should go shorter, or you should go longer, but it  
23 doesn't make much sense to be in this period -- that  
24 you could be in this period of significant transition.

25 So, what we ultimately decided was to

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1 include this climate cycling within the compliance  
2 period, because that will encourage disposal of long-  
3 lived waste at more stable sites. And, for us, the  
4 regulation states very clearly stability is a  
5 cornerstone of disposal.

6 So, we also considered -- next slide,  
7 please. We also considered the characteristics of the  
8 waste. So, if you remember back to the slides of the  
9 waste characteristics, when we're dealing with  
10 something like uranium and ingrowth of the daughters,  
11 that peak risk, or peak concentration doesn't happen  
12 until very long times. But if we go longer, it  
13 captures more of it.

14 You can, potentially, make the argument,  
15 or you can make the argument that when you're at  
16 20,000 years, you're at least within an order of  
17 magnitude of the waste characteristics for uranium.  
18 You have to consider loss from the system. It's not  
19 just a matter of radiological accounting of where the  
20 isotopes are, it's more complicated than that. But  
21 you can argue that you're within an order of magnitude  
22 for depleted uranium.

23 And what I would submit for you to think  
24 about is, what are the order of magnitude effects that  
25 you're going to be dealing with at tens or hundreds of

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1 thousands of years? A one order of magnitude effect  
2 maybe in the noise of some of the other things that  
3 you have to consider. So, should you base your  
4 decision for low-level waste disposal overall on one  
5 type of waste that's going to go into that system with  
6 one particular set of characteristics?

7           When I -- I always think back, for you  
8 Seinfeld fans in this area, there was an episode where  
9 Kramer and Elaine both wanted a bike. And they were  
10 arguing over whose bike it was, so they went to Newman  
11 for the solution to this argument over the bike. And  
12 his solution was to cut the bike in half. And I hope  
13 that this approach that we've come up is not cutting  
14 the bike in half, because a half a bike is not much  
15 use to anybody. But we did want to strike balance in  
16 this problem, and the waste characteristics were only  
17 one part of that decision.

18           So, a value of 20,000 years better  
19 captures radionuclide transport characteristics, too,  
20 compared to 10,000 years. And there is some  
21 diminishing returns for longer periods. You start  
22 getting into this increasing uncertainty, and although  
23 I said uncertainty is not a reason to take action,  
24 what I think that people are trying to convey when  
25 they say the uncertainties are so large, are not that

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1 the uncertainty of waste disposal is so large, but the  
2 uncertainty of everything else that's going to happen  
3 is enormous. So, how do you spend present dollars  
4 today to try to manage that risk and uncertainty given  
5 that context?

6 So, if we think back to say 1918 during  
7 the flu pandemic, 3 percent of the world's population  
8 died in 1918 from the flu pandemic. That's like one  
9 in thirty, okay? The risk of you dying from the flu  
10 in your lifetime is about one in sixty. The risk of  
11 you dying in your lifetime from a fall is about one in  
12 220. The risk of dying from excessive cold in your  
13 lifetime is about one in 6,000. The risk of you  
14 dying from 25 millirem for your lifetime is around the  
15 risk of you dying from excessive cold, or from you  
16 dying in a vehicle collision with a deer.

17 These risks that we're talking about over  
18 long-term, especially something like when you consider  
19 a flu pandemic, or back during the Ice Ages, during  
20 the Little Ice Age, some of the more northern  
21 countries lost like 10-30 percent of their populations  
22 due to starvation during that time. So, when we're  
23 talking 10, 20,000 years, 100,000 years, the risk  
24 context of low-level waste in terms of everything else  
25 that's going on, I think you have to at least consider

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1 it.

2 We, at NRC, are only about protecting  
3 public health and safety from radiological impacts,  
4 and I believe what we've come up with is going to do  
5 that. But for those of you that are members of the  
6 public and other stakeholders, and don't just have to  
7 think in the box, I would ask you to try to think  
8 outside of that box a little bit. Next slide, please.

9 So, when we looked at radionuclide  
10 transport characteristics in the period of  
11 performance, this chart looked at a range of depths  
12 for sites, shallow, moderate, deep, and some different  
13 climate conditions, and probably classified, okay, if  
14 I wanted to change between, say, 10 and 20,000 years,  
15 or 20 and 50,000 years, how does it impact my results?

16 And what you see is that for strongly absorbing  
17 radionuclides, they may be affected at one type of  
18 site, so the zirconium, thorium, cesium, only at  
19 shallow human sites, or those where you would have the  
20 highest transport would you expect that they're going  
21 to be impacted by changing between 10, 20, and 50,000.

22 Otherwise, they show up after that period of time.

23 At the other end of the spectrum, you have  
24 things that are more mobile, especially like  
25 technetium, tritium, and chlorine. And I apologize,

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1 in the Period of Performance paper I noticed when I  
2 was preparing this presentation, these were put in the  
3 wrong box of the table. They're down here in humid  
4 deep, but I looked at it, and that was you test. If  
5 you didn't catch that, you failed the test. So, I  
6 looked at it and I was like that can't be right.  
7 Right? Because you look at the other radionuclides,  
8 and they're all in bands here, so you have plutonium,  
9 actinium, cobalt, I forget what Pa is. You have a  
10 group of radionuclides here that are generally  
11 affected under more mobile conditions, so humid, semi-  
12 arid, shallow, or maybe moderate and humid. And then  
13 you have some that are affected at, say, shallow arid,  
14 or humid deep, or semi-arid moderate, and then you  
15 have a class of radionuclides that are affected by  
16 moderate arid, and so forth, and so on. But it didn't  
17 make sense that these were down in this box. If they  
18 were down in the deep humid box, they should have been  
19 the whole way across the diagonal, and they weren't.  
20 So, we'll correct that in the paper.

21 But the transport characteristics said,  
22 okay, there is a benefit for us going longer, but that  
23 benefit diminishes, and we described that. When we go  
24 to 20,000 years, we have more confidence that we're  
25 going to capture some of these moderately transporting

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1 radionuclides. When we go to 50,000 years, you  
2 capture a few more, but not a lot more. So, there's a  
3 benefit, a big benefit to going -- or a moderate  
4 benefit to going to 20,000 years, but limited  
5 additional benefit to going to 50. Next slide,  
6 please.

7 Now, something that I've spent a lot of  
8 energy on, and tried to convey to people is this no  
9 dose limit for the second-tier. And I think this is a  
10 more important consideration, in my professional  
11 opinion, than the boundary for the compliance period.

12 So, what do you do with these impacts over the long  
13 term, and how you consider them?

14 We believe that this approach of not  
15 specifying a dose limit for the second tier can better  
16 place those in the proper context. So, when I was  
17 talking about your risk of things happening to you in  
18 the context that this problem is in, it's a real world  
19 context. It's not a hypothetical radiation-only  
20 context, but it's a real world context.

21 You can place them in the proper context.

22 How we would do that, NRC, if we had a facility that  
23 we were licensing, and it wasn't in an Agreement  
24 State, is we would complete an environmental analysis  
25 of the impacts for disposal, the disposal licensing

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1 actions taking place, and we would evaluate those  
2 longer term impacts in that context. In the Agreement  
3 States, they would have to use their own processes.

4 The use of no dose limit for a second tier  
5 we believe is better aligned with the long-term  
6 decision making in other programs. So, if you think  
7 about industrial metals, what do they do? They,  
8 basically, dispose of industrial metals, but they  
9 don't have an intruder requirement. They don't look  
10 at the very long-term, how long are those facilities  
11 going to last, and what are the risks that may be  
12 generated from them?

13 I saw some papers by different researchers  
14 that, basically, did intruder assessments of some of  
15 those facilities at some later time, and they argued  
16 that the risks approach one, not some fraction of 1E  
17 to the minus 4, or 1E to the minus 3, but those risks  
18 can become very large. So, why are we treating  
19 nuclear things different than non-nuclear things?

20 I think we have to ask that question, but  
21 we have an approach, and policy, and procedure. And  
22 this was a limited rulemaking, and I think within the  
23 limited rulemaking, this is the best recommendation we  
24 can do.

25 We do believe that when you do this tiered

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1 approach, one of the main reasons for it is to better  
2 align the impacts with the uncertainties. So, the  
3 uncertainties at those later times may be large, and  
4 we don't want people getting into the situation of  
5 trying to argue that the result is 13.7, when that  
6 isn't the argument that they should be making. The  
7 argument they should be making is, I expect the result  
8 to be X, the range of results could be Y, and here's  
9 how my system has been designed to try to mitigate  
10 those uncertainties. But there are a lot of things  
11 that can go on at those longer times, and we can't  
12 hope to be, necessarily, smart to have the high degree  
13 of precision at those times that may be required at  
14 the shorter times. So, we need to align the impacts  
15 with the uncertainties. I think that's a smart thing to  
16 do. Next slide, please.

17           So, important for some of you, and maybe  
18 most important is our guidance on the period of  
19 performance, which you don't have yet, but you will  
20 have in the fall. And what we've done in this area is,  
21 we have developed what we would call risk-informed,  
22 performance-based guidance on the period of  
23 performance. And this would allow some flexibility,  
24 because we're sensitive to okay, if I'm not taking  
25 long-lived waste, or I'm only taking a little bit of

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1 long-lived waste, why should I be considered with  
2 climate change, and all the other things that might  
3 affect my facility? That doesn't make much sense. Is  
4 that a good use of resources? Is it gaining any  
5 protection of people?

6 So, the flexibility that we're going to  
7 recommend is to allow for short-lived waste, or for  
8 low concentrations of long-lived waste, that you don't  
9 have to do the complicated evaluation, or the more  
10 rigorous calculations and evaluation that may come  
11 into play. You can do some simplified things to argue  
12 that your facility has bound the risks, or bound the  
13 risks from the long-lived components.

14 And now the other thing that we've done  
15 is, we would allow to go longer for high  
16 concentrations of long-lived waste. We've heard this  
17 from our Agreement States during our rulemaking  
18 process. So, the compatibility class of the  
19 compliance period is C, is that right, Andy? Yes, C,  
20 which allows somebody to go longer if they choose for  
21 the compliance period in an Agreement State. But it  
22 says up to 20,000 years, so you'd have this  
23 flexibility for the short-lived waste, or low  
24 concentrations of long-lived waste, but if you have  
25 high concentrations of long-lived waste, you have to

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1 do at least up to 20,000 years, and your Agreement  
2 State could make that longer.

3 And in the guidance, we also have a  
4 section on the expectations for the long-term  
5 analysis, because we're going to have -- I know we're  
6 going to have that question; well, what should I put  
7 in there? How should I do it? What should I  
8 evaluate? When am I done? So, we hope to have enough  
9 information in there to answer those questions. Next  
10 slide, please.

11 I think that's it. We'll have time to  
12 discuss these this afternoon. There are some backup  
13 slides that have a number of excerpts from various  
14 ACNW letters and things. I think they're very  
15 illuminating of where we started, and where we are  
16 now. So, I tried to give you those so that you'd know  
17 the context of what we are working on. Thank you.

18 MR. SMITH: Okay. It's about 10:21 now,  
19 so we'll take a 15-minute break.

20 (Whereupon, the proceedings went off the  
21 record at 10:23 a.m., and went back on the record at  
22 10:39 a.m.)

23 MR. SMITH: Okay, we've had some  
24 stakeholders to come into the meeting after we  
25 started, and also, we had some stakeholders come on to

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1 the telephone.

2 We're going to go over a couple sort of  
3 admin ground rule issues that we talked about earlier.

4 First of all, those on the line, the  
5 meeting is getting transcribed.

6 So, Kayla, did you need the names of all  
7 of the stakeholders that are on the line?

8 If you can individually let us know who is  
9 on the line, if you can speak loud and clear, if we  
10 can't understand you, then we'll ask your name again.

11 MS. FORNASH: This is -- I guess I'll  
12 start. This is Elizabeth Fornash from Department of  
13 Energy and Environmental Management Office.

14 MR. SMITH: Thank you, Elizabeth.

15 Who else is on the line?

16 MR. LUNDBERG: Rusty Lundberg, with the  
17 Utah Division of Radiation Control.

18 MR. BONANNO: Jerry Bonanno, with the  
19 Nuclear Energy Institute.

20 MR. SMITH: One moment, please.

21 Okay, thank you, Rusty, thank you.

22 MR. JANATI: Rich Janati, Pennsylvania  
23 DEP.

24 MR. SMITH: Thank you.

25 Is there anyone else?

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1 MR. KLEBE: Michael Klebe, State of  
2 Illinois.

3 MR. SMITH: I'm sorry, can you repeat?

4 MR. SMITH: Michael Klebe, State of  
5 Illinois.

6 MR. SMITH: Thank you, Michael.

7 Is there anyone else who dialed in?

8 (Pause.)

9 Going once --

10 MR. SEITZ: Are you asking who's dialed  
11 in?

12 MR. SMITH: Yes, please.

13 MR. SEITZ: This is Roger Seitz from  
14 Savannah River National Laboratory.

15 MR. SMITH: Thank you, Roger.

16 MS. WOODRUFF: And this is Liz Woodruff  
17 from the Snake River Alliance in Boise, Idaho.

18 MR. SMITH: Thank you, Liz.

19 MS. O'DELL: And this Maureen O'Dell  
20 again.

21 MR. SMITH: Thank you, Maureen.

22 MR. SMITH: Also Danny Smith, DOE  
23 headquarters support.

24 MR. SMITH: Thank you, Danny.

25 Is there anyone else who's dialed in?

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1 We'd like to get your name to get it transcribed.

2 Thank you. We're going to continue with  
3 the agenda. Just as a point of emphasis, the comments  
4 that we're taking at this time would be feedback on  
5 the draft proposed rule text. That's the only  
6 comments we will take at this time.

7 After lunch, we'll take feedback  
8 concerning the period of performance.

9 Before we start taking comments again,  
10 we'd like to go over the ground rules. Of course, the  
11 first ground rule is respect for those who are making  
12 comments, who are responding to the comments. And  
13 part of respect is to not have the sidebar  
14 conversations be -- again, we're trying to transcribe.

15 We have those who have dialed in, and I  
16 also have the webinar. We want to give everyone an  
17 opportunity to be heard by providing their comments,  
18 and to get those comments captured.

19 Also, we have a mike -- we're going to  
20 bring a mike around. So please wait for the mike  
21 before you provide your comments, so, again, that we  
22 can get it transcribed and those who are dialed in can  
23 also hear your comments.

24 Cell phones, again, thank you, I didn't  
25 hear any cell phones, though, but please keep them in

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1 courtesy mode. If you went during the break and used  
2 your cell phone, make sure it's in a courtesy mode,  
3 i.e. either on vibrate or silent mode. We do have a  
4 parking lot here that will capture information that we  
5 may need to go back and address.

6 We're going to -- first, we have comment  
7 cards here for personnel in the room who have given  
8 comments. If there's anyone else who wanted to  
9 provide a comment on the rule text, please give me  
10 your comment card, and I'll call upon you.

11 So we're going to start here in the room,  
12 and then we'll go to those who have dialed in.

13 The first comment will be from John  
14 Greeves.

15 Oh, I'm sorry, John.

16 (Off-the-record comments.)

17 MR. GREEVES: Well, first, thanks for  
18 putting the meeting together. And I'm told that this  
19 is about five minutes of commentary, so --

20 MR. SMITH: That's correct. We're going  
21 to limit the comments to five minutes at this time to  
22 give everyone an opportunity.

23 MR. GREEVES: Five minutes is not enough,  
24 but that's okay with the other venues.

25 So, since I only have five minutes, let me

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1 quickly say, you did a good job. 85 percent of what  
2 you've done is really good, it's consistent with  
3 comments that Jim Liebermann (phonetic), so I  
4 congratulate you.

5 So don't take my rant on 15 percent to be  
6 anything other than that 15 percent. 85 percent of  
7 what the staff did, really did a good job. It's  
8 about, you know, the margins, what things are  
9 significant, some of which, Larry, you already said.  
10 In fact, you're probably anticipating part of what I'm  
11 going to say.

12 So, with five minutes, I've got three  
13 comments, and they aren't necessarily in order of  
14 importance.

15 The rule language in about three spots  
16 could be improved if it would recognize that  
17 reasonably foreseeable, site-specific scenarios, they  
18 aren't mentioned, and it's, having done this for over  
19 30 years, it's very important to have this concept of  
20 reasonable foreseeable scenarios. The Commission has  
21 done in a number of places, I can't give you the  
22 citations now. Maybe I will on the written format.

23 But there's three different --

24 (Off-the-record comments.)

25 PARTICIPANT: This is better. We can hear

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1 now, thanks.

2 MR. GREEVES: Anyhow, well, you're going  
3 to have to bear with me.

4 To be specific, 61.2 definitions, you have  
5 to assume on your intruders, there's a sentence that  
6 says about the intruders, and then engage in  
7 activities. Well, in front of activities, I'd submit  
8 you should put reasonable foreseeable activities. So  
9 that's one spot.

10 Right below it, item three, is another  
11 statement, inadvertent intruder engaging in  
12 activities. It's very vague, it's not going to help  
13 us. Engage in foreseeable activities, avoid unbounded  
14 speculation on this.

15 And there was a third spot. They're going  
16 to humor me. Other concepts, it talks about engages  
17 in activities that unknowingly expose the intruder --  
18 well, again, reasonable foreseeable activities.

19 So, you'll get these in writing  
20 eventually, so, but that's the first of three points I  
21 want to make in five minutes.

22 The second point is a concept of, you're  
23 requiring -- a number of places to do with performance  
24 assessment, intruder analysis, it doesn't matter what  
25 you call it, but I think that the concept of when you

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1 do that, and demonstrate those performance objectives  
2 are satisfied, that the disposal requirements that are  
3 tied to the generic, non-site-specific classification  
4 tables, they should be deferred to waste acceptance  
5 criteria generated from this new performance  
6 assessment.

7 You are ready to do that under legislation  
8 from 31.16. You already do that at the West Valley  
9 Demonstration Policy Act. These are items that the  
10 Commission is already doing. So I would direct your  
11 attention to that concept.

12 PARTICIPANT: Could you repeat that, John?  
13 That point?

14 MR. GREEVES: That the rule requires, and  
15 I agree, site-specific performance assessment and  
16 intruder analysis, and if you demonstrate those  
17 performance objectives are satisfied, that the  
18 disposal requirements tied to the tables, those tables  
19 are generic. They're not site-specific. There's a  
20 lot of debate about the tables, and you're going to do  
21 further work on them.

22 In the meantime, if an Applicant and a  
23 regulator review that performance assessment and find  
24 it acceptable, then the resulting waste acceptance  
25 criteria should be allowed to override those tables.

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1 It's effectively what DOE does.

2 Larry, you understand what I'm saying.  
3 So, that's the second point, and we can, in response,  
4 talk about these.

5 The third point is the period of  
6 performance. I know there's a session this afternoon,  
7 but you said this is about the rule language.

8 And Dave, you did a great job, the paper  
9 is really good. I just think you got the wrong  
10 number.

11 The -- you indicate in your paper, it's a  
12 policy call. Truly, it really is a policy call, and  
13 you give very good -- five options to consider, how to  
14 make the call on what the number is, and  
15 protectiveness, two of which are consistency,  
16 treatment of uncertainty, facilitation of decision-  
17 making. These are the -- I align with those  
18 principles.

19 You also acknowledge that selection of  
20 20,000 years for a compliance period may create  
21 confusion among some stakeholders.

22 Well, it's created more than confusion,  
23 it's created a lot of consternation in some quadrants.

24 I'm not sure you're going to hear about it all here  
25 today, maybe later, but you selected these evaluation

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1 criteria, two which are consistency, and then somehow,  
2 you selected 20,000 years, which is inconsistent with  
3 what the Commission has done for decades.

4 So this is the third point there will be  
5 more discussion of this afternoon. Larry invited us,  
6 hey, if you don't like what we said, what would you  
7 use?

8 And the answer to that is, I'd be  
9 consistent with what the past practice has been, the  
10 Commission has used 10,000 years in a number of  
11 places. They've used 1,000.

12 I'll tell you which one is my preference.

13 Maybe I'll decide that by June 18th, but being  
14 consistent with the past practice is what I  
15 individually would recommend, not coming up with some  
16 new number that nobody else has used and is going to  
17 create -- it can undermine some of the credibility out  
18 there, coming up with these new numbers. So that's my  
19 input, and we can talk more about that this afternoon.

20 MR. SMITH: Good. Thank you, John.

21 MR. GREEVES: Hopefully I kept that to  
22 five minutes.

23 MR. SMITH: Somewhat. We gave you a  
24 little -- but we had problems with the mike.

25 MR. LESLIE: Hey George, as you're picking

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1 out the next person to speak, John brought up a good  
2 point.

3 There is an opportunity to provide written  
4 comments, and I think the deadline, Larry or Andrew,  
5 is June 18th, and that's all mentioned in the Federal  
6 Register Notice.

7 So don't feel like, even if we're keeping  
8 you for five minutes, I know, John, you'll have a lot  
9 to write in writing, but I just wanted to let everyone  
10 else know on the line that there's an opportunity not  
11 just only today, but to provide written comments.

12 Go ahead.

13 MR. SMITH: Okay, good. Thank you.

14 And also, we'd like to remind you, if  
15 you've phoned in, please put your local bridge on  
16 mute.

17 We'll go to Thomas Magette.

18 MR. MAGETTE: Thank you. I'm Tom Magette.

19 I'm with Energy Solutions. It's a little difficult  
20 to separate out the period of performance question and  
21 comments on that from some of the other aspects of the  
22 proposed rule, because I would presume that they drive  
23 one another.

24 So I'll make a brief comment there, but  
25 I'll try to reserve some of it for this afternoon,

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1 because I certainly wouldn't want to pass up another  
2 opportunity to comment.

3 I think 20,000 is the wrong number as  
4 well, and I think you gave, actually, David, some  
5 justification for why it's the wrong number in some of  
6 your discussion of uncertainty.

7 I would suggest that pseudo-certainty is  
8 not an improvement on uncertainty, and presuming that  
9 we can calculate things with some reliable level of  
10 precision at that time frame, provide pseudo-  
11 certainty, I agree with your comment that the  
12 decision-making process doesn't have to be easy. I  
13 agree with your comment that it's a policy question.  
14 I agree that decision-makers should be provided with  
15 information.

16 However, when we start boxing in what that  
17 information has to be and calculating numbers and  
18 comparing them to dose standards, then we take  
19 discretion away from the decision-maker.

20 And that, I believe, is a pseudo-  
21 certainty, because I don't believe we can calculate  
22 something that's that meaningful in that time period.

23 So, that would be my general comment about  
24 that. I have some others, I'll save them.

25 Another comment I would make in regards to

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1 the language regarding the inadvertent intruder, I  
2 believe that you have -- you've taken a deterministic  
3 rule and suggested changes under the umbrella of  
4 making it more risk-informed, but my comment about the  
5 intruder would be that it's even more deterministic  
6 and not at all risk-informed.

7           It's determinism on steroids, requiring  
8 the presence of an intruder at a site over the  
9 compliance period, requiring an analysis of the  
10 performance of barriers over that period is, I would  
11 suggest, something that we can't really do, requiring  
12 the uncertainty about the performance of those  
13 barriers, I think the uncertainty about the  
14 performance of any barrier over a 20,000 year time  
15 period will simply swamp anything that we could say  
16 about how that barrier performs.

17           So, I don't think that that's risk-  
18 informed decision-making.

19           It's also a change from something that the  
20 Commission itself has previously directed in the LES  
21 proceedings. NRC staff testified that the absence of  
22 an intruder, a specific intruder at the Clive site  
23 was, in fact, appropriate in their view.

24           And ASLB accepted that, and the Commission  
25 accepted that and wrote an order where they explicitly

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1 accepted that, not just glossed over it. So the  
2 Commission itself has said that that is an okay  
3 conclusion.

4 Understand you're writing a rule, and  
5 certainly this will go to the Commission for their  
6 consideration, so it certainly is not unreasonable to  
7 expect that they may choose to make a different  
8 decision.

9 But it is worth nothing, I believe, that  
10 it is a different decision and it contravenes existing  
11 Commission policy. So I think that the intruder  
12 question, the specificity of that language, is also  
13 inappropriate.

14 (Off-the-record comments.)

15 Okay, well, I would like to make another  
16 general comment about this, which is that I believe  
17 that this has become a uranium rule.

18 And that goes directly to a question you  
19 asked towards the end of your presentation today that,  
20 should one isotope drive an entire process, and I read  
21 this as doing so.

22 I appreciate your comment that you made  
23 about guidance regarding the POP, and if someone  
24 chooses not to deal with some of these wastes, then  
25 they will have the -- well, the opportunity not to

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1 have to do the PA and the IO that are described in  
2 here.

3 But that's guidance, and if that is in  
4 fact your intention, then the rule should say that,  
5 because if I pick up the rule and I look at the  
6 concepts in 61-7 and I look at the other requirements,  
7 it doesn't tell me that anywhere.

8 So I don't believe that putting that in  
9 guidance is sufficient, and I'll save the rest of my  
10 comments.

11 MR. SMITH: Thank you, Tom.

12 Dan Shrum?

13 MR. SHRUM: Hi, my name is Dan Shrum with  
14 Energy Solutions. I'll be very quick. My -- can I  
15 save my time for later? That doesn't work, does it.

16 (Laughter.)

17 I'm just kidding.

18 Two minor comments, well, to us, they're  
19 not minor, but the words, and I know that you changed  
20 them, but up to 20,000, that doesn't do us any good,  
21 unless you're going to say when you don't have to go  
22 up to -- or when you don't have to go to 20,000.

23 I'm not saying that 20,000 is the right  
24 number. We'll get to that after lunch. But up to is  
25 -- I mean, those are -- those are core choices -- go

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1 ahead.

2 DR. ESH: Just to clarify, it's peak  
3 annual dose up to, so by defining it that way, it will  
4 include whenever your peak occurs up to that 20,000  
5 number.

6 MR. SHRUM: For that specific isotope, and  
7 I understand that. So, I'm going to pick an isotope -  
8 -

9 DR. ESH: It's not on an isotope-by-  
10 isotope basis. It's just for all your isotopes in  
11 your system.

12 MR. SMITH: And for those who've called  
13 in, that's Dave Esh that's talking.

14 MR. SHRUM: Again, I see that in there,  
15 but the "up to" is still going to be problematic,  
16 because the people who don't want to do the work that  
17 we do are just going to say, it says 20,000. So,  
18 that's just -- that's one of the issues.

19 Another issue is, although it's down the  
20 road, I'm curious about how long we will have to  
21 implement this new rule. I know you'll have to go  
22 through your rule making, the states will have to  
23 adopt it somehow, and just realize when you get to  
24 that part of it, on implementation, these things take  
25 a long time to do.

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1           They take a long time to prepare, they  
2 take a long time to review, they take a long time to  
3 be approved, and you'll need to give additional  
4 guidance, I believe, on what we do during the interim,  
5 once this thing gets passed.

6           And the last issue is on the last page of  
7 the rule, under 55-6, 55, I believe it was 86. I'm  
8 not quite sure if some of those got cut off.

9           And it just states that any waste  
10 classified under the subparagraph must be analyzed in  
11 the intruder assessment required by 61-42. We're  
12 wondering, these are wastes that are not in the table,  
13 and do we not have to do a performance assessment  
14 also, or just an intruder assessment, if that's  
15 required?

16           And why was the performance assessment not  
17 included? It's just not clear to us. I know we  
18 haven't had a lot of time to look at this, but it  
19 looks like we only have to do the intruder assessment.

20           MR. SMITH: Okay, thank you.

21           William Dornsife? Is it Dornsife? Thank  
22 you.

23           MR. DORNSIFE: I'm Bill Dornsife with  
24 Waste Control Specialists, and my most burning comment  
25 was the last thing that was mentioned, that this thing

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1 was going to be compatibility C.

2 I mean, you guys are changing the  
3 performance objectives, which were previously a  
4 category one or whatever you call it now. So, you  
5 know, does that mean people don't have to say 25  
6 millirem effective equivalent dose?

7 DR. ESH: This is Dave Esh. I'll clarify  
8 it for you. The -- it's broken into A and B now. A  
9 is still the same compatibility class. B regarding  
10 the period of performance is the compatibility C.

11 So you still have to do the performance  
12 objective and the dose limit. You have flexibility to  
13 be more restrictive on the period of performance part  
14 of it.

15 MR. DORNSIFE: Well, I guess I'd like to  
16 see some justification. I have no problem with -- for  
17 shorter-lived materials going shorter, and the rule  
18 could say that.

19 But I'd like to see a justification of why  
20 this shouldn't be highest-level compatibility, since  
21 it is changing the performance objectives. It  
22 assures, you know, the way it is now, you know,  
23 category C, probably nobody will adopt it.

24 In protection of inadvertent intruders, I  
25 don't see any justification of the 500 millirem. What

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1 is the reason for choosing 500, other than it's a  
2 carryover from the part 61 EIS?

3 I have no problem with the 20,000 year  
4 performance period. The problem I have is when you  
5 look for peaks beyond being undefined.

6 I mean, what if, you know, you see 100,000  
7 years from now, or even 30,000 years from now, there's  
8 a huge dose. There's, you know, 100-some REM.

9 And in fact, I played around with RESRAD a  
10 little bit, looking at depleted uranium. And I guess  
11 the RESRAD thing you had in your technical analysis  
12 was useless without a cover on it. Who cares about  
13 radon if you have a decent cover?

14 But if you start varying some of the  
15 parameters, you, in fact, get some huge doses, right  
16 outside of 20,000 years from the water pathway at  
17 certain sites.

18 So, you know, not having any statement of  
19 what is acceptable or not, leaving it to society to  
20 judge, is, to me, is going to create some problems.

21 And in our case, I mean, the 20,000 years,  
22 the only thing that we see peak before 20,000 years is  
23 chlorine-36. All the rest of it peaks well beyond  
24 that. I mean, that's, you know, an example of a deep,  
25 good site. You know, that's exactly what you see.

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1           And I want to talk some more about  
2 chlorine-36, because that is also a problem for future  
3 consideration.

4           You also, in concept 6, you talk about  
5 burial below 30 meters as being acceptable intruder  
6 protection. Is that intended to replace the five  
7 meters that's already in the rule? I mean, I don't  
8 know where that came from.

9           PARTICIPANT: I can't hear anything.

10          MR. DORNSIFE: Okay. Well, anyway, I  
11 mean, you know, and I guess there needs to be some  
12 clarification. Whatever number we use, does that  
13 include cover, or does that include waste as part of  
14 that depth?

15          MS. YADAV: Can you direct us to what  
16 you're talking about? Because I think that's existing  
17 text.

18          MR. DORNSIFE: Well, in C, in C-6, you  
19 say, "more robust intruder barriers, such as burial  
20 below 30 meters."

21                 (Pause.)

22                 Okay. That's just inconsistent.

23          MR. SMITH: Thank you.

24          MR. MCKENNEY: Hi. I'm Chris McKenney.  
25 One point that I think we didn't clarify well enough

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1 as far as this meeting was, a lot of the information  
2 that, well, one that Phil has just talked about, along  
3 with -- usually, when you normally see rule text or a  
4 proposed rule, you see the statement --

5 PARTICIPANT: Will the commenter please  
6 speak up?

7 MR. MCKENNEY: Sorry. I got closer to my  
8 mouth.

9 PARTICIPANT: We can't hear anything.

10 MR. SMITH: He moved the mike closer to  
11 his mouth. Thanks for the comment.

12 MR. MCKENNEY: Okay, this is Chris  
13 McKenney from NRC. Is it, in this stage of a draft  
14 proposed rule text, we don't have the statements of  
15 consideration that go with it which would define a lot  
16 of the discussion on some of where some of these other  
17 numbers came from, and some of the other discussions  
18 of the basis.

19 But they are good comments, to make sure  
20 that we do emphasize in the statements of  
21 consideration or in guidance space. And so, continue  
22 with those comments.

23 But yes, we did not provide statements of  
24 consideration with this rule text, which does have a  
25 little less information than what you'd normally see

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1 in a proposed rule.

2 MR. LESLIE: Larry, did you have something  
3 to add?

4 MR. CAMPER: Larry Camper. Well, I'd get  
5 a clarifying question, and one new comment.

6 You talked about the 50 millirem number.  
7 You're right that there's a historical basis, of  
8 course, going back to the original environmental  
9 impact statement for part 61.

10 Accountability of intrusion was assumed to  
11 be one, and that was the basis, really, for the 500  
12 millirem as compared to today's public dose limit of  
13 100.

14 Are you suggesting that the number is too  
15 high, or too low?

16 MR. DORNIFE: No, I just didn't see a  
17 justification. I mean, the 500 was based on the  
18 public dose limit at the time, so, if you're going to  
19 be consistent, then you need to be fully consistent.

20 MR. CAMPER: Thanks.

21 MR. SMITH: Thank you. The next comment  
22 will come from Lisa Edwards.

23 MR. LESLIE: I'd just like to remind  
24 everyone that this microphone, for the people on the  
25 bridge line, has to be like this close, an inch away

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1 or less.

2 Sorry, Lisa.

3 MS. EDWARDS: That's fine. Can we corral  
4 the speaker?

5 I'm just kidding. Never mind.

6 First of all, I would like to echo John's  
7 comments to the panel. This is an extremely complex  
8 problem, and it takes a great deal of thought and  
9 analysis.

10 There is no easy answer to any of these,  
11 and I would like to acknowledge the work that you have  
12 done to address that -- these very difficult concepts  
13 in the proposed rule that you've produced.

14 I want to bring attention to a couple of  
15 items. The first one is application of the  
16 performance assessment to all waste streams.

17 Other people have mentioned it, but I  
18 think it bears repeating in that in my read of the  
19 performance assessment or of the rule, the proposed  
20 wording, it implies that this performance assessment  
21 must be done for all waste streams.

22 And if you already foresee the need to  
23 include kind of points of consideration or maybe there  
24 could be additional language added that said something  
25 along the lines of the performance assessment would be

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1 required for those waste streams, dominated by  
2 nuclides that have a half-life exceeding -- etcetera.

3 But for typical waste streams that are not  
4 dominated by such nuclides, it would not be required.

5 It could be performed, but it wouldn't necessarily be  
6 required.

7 The second is, this is maybe a little bit  
8 the scientist in me coming out, when we talk about  
9 dose calculations, I get a little confused when we  
10 extend out into a very long range time period.

11 To do a dose calculation, you need two  
12 really important components to be known. The first  
13 is, the activity, and the second is the dose pathway,  
14 which implies a receptor.

15 So when we get out past 1,000 years or  
16 10,000 years or 20,000 years, you may know and be able  
17 to calculate the activity and apply reasonable  
18 assumptions on the concentration of that activity when  
19 mixed with environmental factors or taking in  
20 surrounding environmental factors.

21 Your ability to produce a defensible dose  
22 pathway, however, comes into question. If you resort  
23 to what I call the fencepost dose calculation, which  
24 means your intruder or receptor is right there on the  
25 site, 24/7, 365 days a year, and subject to the very

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1 most restrictive or worst case scenario for exposure.

2 That is bounding.

3 But it is not realistic or credible, and  
4 we are actually encountering this at nuclear power  
5 plants today who are doing dose calculations and who  
6 have previously relied upon fencepost calculations and  
7 are now going back to refine those and make them more  
8 accurate, because the results of those type of  
9 calculations can, in fact, be misleading, bounding but  
10 not accurate.

11 So I would challenge the group, what the  
12 credibility in a risk-informed regulation are  
13 requiring a dose calculation where you cannot  
14 reasonably identify a receptor is.

15 Am I already past five minutes?

16 MR. SMITH: You have about a minute left.

17 MS. EDWARDS: Oh. That was one and two,  
18 so, three.

19 This goes to kind of the underlying  
20 premise in our regulation. I think we've stated  
21 pretty clearly that our desire is to have a risk-  
22 informed regulation.

23 I am confused by a regulation that  
24 introduces a probability of intrusion of one and the  
25 probability of the worst-case intrusion of one being

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1 used in a regulation that needs to be risk-informed.

2           There is no credit given that I can see  
3 that the probability of intrusion and waste is not  
4 one, and there is no kind of risk analysis associated  
5 that I have found yet that is associated with, what is  
6 the risk or the consequence from both dose and  
7 security standpoint if disposal is not provided, a  
8 pathway for disposal is not provided?

9           MR. SMITH: All right. Thank you, Lisa.

10           MR. LESLIE: And again, we'll remind folks  
11 that we want to give everyone a chance to talk, and  
12 there will be additional time for the people who have  
13 already talked.

14           MR. SMITH: Okay, we've exhausted all of  
15 the cards within the facility.

16           We're going to find out if those on the  
17 line would like to make comments also.

18           MS. WOODRUFF: Yes, this is Liz Woodruff  
19 from the Snake River Alliance.

20           MR. SMITH: I'm sorry, can you repeat your  
21 name again, please?

22           MS. WOODRUFF: Liz Woodruff from the Snake  
23 River Alliance.

24           MR. SMITH: Okay. Thank you, Liz.

25           MS. WOODRUFF: First, thank you to the NRC

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1 for providing this opportunity for stakeholders in  
2 affected areas like Idaho to comment on this ruling,  
3 which we appreciate the opportunity to have our voice  
4 heard.

5 This issue is particularly of interest to  
6 the Snake River Alliance and our members in Idaho,  
7 because there is a proposal for an enrichment factory  
8 that would produce depleted uranium, which is one of  
9 the waste streams addressed in this language.

10 I'd just like to start by saying that I  
11 think the very premise of the articulation of the new  
12 rule is flawed and not adequate.

13 That's not to say that there hasn't been a  
14 very clear attempt to deal with some of those  
15 inadequacies in the language, and I'll address that  
16 below, but we believe that deep geological repository  
17 is the best location for these waste streams, and that  
18 especially in relation to depleted uranium, this rule  
19 is simply inadequate in addressing the  
20 characteristics, the long-lived characteristics of  
21 that waste stream, and that that results in a rule  
22 that is pretty confusing, and ends up giving some  
23 vague language for pretty serious issues, and it just  
24 kind of leaves us confused.

25 In the definitions in the 61.2

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1 definitions, I think that there's a disconnect between  
2 the long-lived aspects of the waste stream and the  
3 conversation in number one about institutional  
4 controls.

5 I think -- you know, it's pretty clear  
6 that we can't assume institutional control for the  
7 life span of depleted uranium in particular, and that  
8 creates a disconnect between numeral 1 and the second  
9 paragraph of numeral 3 in the definition section.

10 Then, moving on to the concept section, in  
11 number 2, excuse me, let's see, yes, number 1, numeral  
12 -- or excuse me, letter A, we don't believe that near-  
13 surface is good enough. Again, we believe that a deep  
14 geological repository should be looked at.

15 And in number 2, ending with "in choosing  
16 a disposal site, site characteristics should be  
17 considered in terms of the indefinite future, taking  
18 into account the radiological characteristics of the  
19 waste and be evaluated for at least a 500-year time  
20 frame," I would also, have other speakers have  
21 mentioned, raise the question of why a 500-year time  
22 frame?

23 This also applies to the paragraph  
24 mentioned earlier by another gentleman about the  
25 effective life of an intruder barrier. So why is the

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1 500-year time frame used?

2 And I think it's real important here to  
3 acknowledge the way the proposed language talks about  
4 maximum concentrations being key.

5 I think that that's really good that  
6 that's in there, but it does get back again to some of  
7 the difficulties of containing the dangers around this  
8 kind of waste when you talk about near-surface  
9 disposal.

10 In the conversation about stability that  
11 happens in C-2, I think it's real important and good  
12 that the stability question is in here or it's raised  
13 and mentioned.

14 But again, I think that the long-lived  
15 characteristics of this waste stream make a stability  
16 assessment nearly impossible. And that gets back to  
17 my first point, that deep geological repository should  
18 have been looked at.

19 And then in the final -- in, on page 4,  
20 the first paragraph ending with, "for long-lived waste  
21 and certain radionuclides prone to migration, a  
22 maximum disposal site inventory based on the  
23 characteristics of the disposal site may be  
24 established."

25 I think that that is really good language,

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1 and I appreciate that it's there, although I think it  
2 needs to be clearer what that means.

3 And let me look real quickly here. This  
4 discussion of enhanced controls, I'm also glad that  
5 that's in there, but I think that there need to be  
6 examples of what those enhanced controls would look  
7 like.

8 And in number seven, "the intruder  
9 assessment must identify the intruder barriers and  
10 examine the performance barriers. The intruder  
11 assessment must also address the affects of  
12 uncertainty on the performance of the barriers,"  
13 again, I think that's good, but that's an  
14 impossibility at the sites that are being looked at  
15 for near-surface disposal, and again, what I'm talking  
16 about in terms of vague language.

17 MR. SMITH: Okay. All right. Thank you,  
18 Liz.

19 MS. WOODRUFF: Yes, actually, I do want to  
20 make one more point.

21 Real quickly, on 61.12, specific technical  
22 information and the technical analyses below, I think  
23 that this language about the performance assessment of  
24 the site, identifying characteristics of, I guess, in  
25 numeral A, I think this explicitly should and will

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1 ultimately exclude energy solutions, and that was  
2 talked about the DU working group in Utah, the  
3 characteristics of that site and the longer time  
4 frames.

5 And I'd like a lot more specific language  
6 about what a decision would look like based on these  
7 things. Thanks.

8 MR. SMITH: Okay. Thank you, Liz.

9 Do we have someone else with a comment on  
10 the line?

11 Again, this is George Smith. I'm one of  
12 the co-facilitators for the meeting, and we're  
13 soliciting comments on the line now.

14 And again, these comments are specific to  
15 the rule text at this time.

16 If we don't have any more comments on the  
17 line, then we can go back to -- is it Linda, do you  
18 want to finish your -- I'm sorry, Lisa, I'm sorry.

19 MR. LESLIE: Yes, we just wanted to make  
20 sure everyone -- we didn't know how many people we'd  
21 have on the line.

22 MR. SMITH: Now, we have a little bit more  
23 time, and we'll go for five minutes again, or three.  
24 Five minutes.

25 MS. EDWARDS: This is kind of a new

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1 concept that I'm going to put out for brainstorming  
2 for your group to consider, and it's a follow-on to  
3 what Bill Dornsife recently commented on just a few  
4 minutes ago.

5 So we have in our intruder scenario  
6 probability one of intrusion and a probability of  
7 intrusion in the worst case of one, and no recognition  
8 that the actuality of that is probably not a one.

9 So, when I try to kind of look back and  
10 into other areas of how they deal with dose limits in  
11 an accident type of scenario, what I came across was  
12 two different documents.

13 The first one is EPA 400, which relates to  
14 the dose limits associated with the need to evacuate  
15 people in a radiological emergency or under  
16 radiological release conditions.

17 Tied to that, or related to that, is a  
18 document that is under development. My understanding  
19 is it's under development from FEMA, and it's a FEMA  
20 REP document.

21 And it is related to, what are the dose  
22 limits associated with returning evacuees to a  
23 previously evacuated area. And they are different  
24 than the 500 millirems.

25 The limits that are being considered in

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1 that document that's being revised is 2 rem per year  
2 in the first year, and then it drops to the 500  
3 millirem in the second year, which also assumes  
4 prolonged exposure over, you know, a lengthy period of  
5 time up to 50 years.

6 And I wonder, if we pursue that line of  
7 thought and try to apply it in this low-level waste  
8 disposal scenario, if that influences the choice of  
9 500 millirem per year as the limit in an intruder  
10 scenario.

11 I think if we adopted a concept of -- or a  
12 recognition that this is an accident, a possible  
13 accident and not an actual accident, and tried to help  
14 weigh the limit associated with that with a higher  
15 dose limit, it takes into account or maybe helps  
16 balance a little bit some of the probability  
17 assumptions that you've made, or that we've made  
18 historically.

19 MR. SMITH: Is there anyone else?

20 MR. MAGETTE: Thank you. I have a few  
21 other comments, and then I have a question.

22 The first one is in the new 61-7-C-6,  
23 which is on the screen.

24 MR. SMITH: I just want to remind you now,  
25 if you called in, to mute your phone line.

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1 MR. MAGETTE: The phrase some waste may  
2 require enhanced controls, I think that's terribly  
3 vague.

4 But in all that section, it seems -- this  
5 is, I think, similar to what John was saying, John  
6 Greeves, the section seems to imply that there's the  
7 use of a PA and an IA to make up for shortcomings that  
8 are inherent in the tables as a result of having done  
9 a generic evaluation.

10 So, there's a, if you will, a way for  
11 there to be a higher standard to be met by something  
12 that's not specified in the table, because by virtue  
13 of not having specified it, the components were not  
14 sufficiently restrictive.

15 I would say that if you're going to do  
16 that, you should take it a step further, and use that  
17 to generate a site-specific lack.

18 If the generic tables have shortcomings  
19 that make them insufficiently protective, in some  
20 cases, it's equally true that they have shortcomings  
21 that make them overly conservative in certain cases.

22 So I would suggest that there are two sides to the  
23 question that is introduced in 61-7-C-6.

24 The other comment I would make that the  
25 definition of -- the addition of the term "long-lived

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1 isotopes," which I think is part of the uranium-  
2 ification of the rule, if you will, has possibly led,  
3 or could lead, to an unintended consequence in that  
4 there are other waste packages that we get that have  
5 isotopes not listed in the tables that are long-lived,  
6 for example, transuranics, actinides.

7 Obviously, low-level waste is defined by  
8 what it is not as opposed to what it is. So those  
9 isotopes can be present, as long as they're not in  
10 sufficient quantity to make the waste true waste, but  
11 they're there.

12 There's nothing that suggests that there's  
13 some sort of concentration, just a 10 percent activity  
14 reduction of less than 10 percent, is not sufficient,  
15 I don't think, to require an increased stability  
16 requirement for the large majority of existing waste  
17 that we accept.

18 So I think that definition is a  
19 significant new requirement, and that's an unintended  
20 consequence, so I offer that for your consideration.

21 The question I have has to do with the  
22 language at the end of 61.7A, this, "alternate methods  
23 of disposal can be accepted." That's kind of 61-58-  
24 ish.

25 Is that your intention, that this is

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1 adding the flexibility that's currently invoked by  
2 61.58, now under 61.7? And if not, what does it mean?

3 Thank you.

4 COURT REPORTER: Could you identify  
5 yourself for the record, please?

6 MR. MAGETTE: I'm Tom Magette of Energy  
7 Solutions.

8 MR. SMITH: Thanks, Tom, for your comment.

9 Any further comments? John?

10 MR. GREEVES: I'd like to second Bill  
11 Dornsife's comment on the category for compatibility.

12 That's a really important issue. I'm quite -- I  
13 don't quite know what the word is, surprised, I'll pin  
14 it down, surprised that you would consider the pre-  
15 provision of 61-50-42 as anything but exact  
16 compatibility.

17 There are real consequences in how you  
18 address these performance objectives. These  
19 performance objectives are addressed in legislation  
20 for 31-16, and --

21 MR. SMITH: I'm sorry. If you've called  
22 in, please place your bridge on mute, please.

23 Thank you, John.

24 MR. GREEVES: So I fully expected that it  
25 would be exact compatibility, whatever the right

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1 number is.

2 So, could you share with us what your  
3 designation on compatibility of these language items  
4 are before we have to comment on June 18th?

5 Because, especially these performance  
6 objectives, these things really need to be exactly the  
7 same across the board. And it's going to affect other  
8 legislation that points at these performance  
9 objectives, I see nothing that points to anything but  
10 exact compatibility in the performance objectives.

11 So, again, I'm free to express mine and  
12 another to hold me back.

13 MR. LESLIE: John Greeves, thanks for your  
14 comment.

15 MR. SMITH: Are there any more comments  
16 here?

17 Again, we'd like to ask you to place your  
18 phone on mute, please.

19 MR. DORNSIFE: This is Bill Dornsife with  
20 Waste Control Specialists.

21 It appears to me, I think obviously, one  
22 of the more important things in here is the 20,000  
23 years and how you came up with it.

24 It appears to me to be an attempt to deal  
25 somehow with the unique waste streams in one rule,

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1 rather than maybe separate out how you do performance  
2 assessments for, you know, the unique waste compared  
3 to the normal waste. It seems like a lot of the  
4 comments are kind of hitting at that issue.

5 10,000 years is certainly long enough for  
6 one of the middle, low-level wastes, but 20,000, is  
7 that long enough for depleted uranium?

8 I don't know if NRC's ever looked at the  
9 toxicity, the relative toxicity of depleted uranium,  
10 compared to high-level waste. It's pretty similar,  
11 you know, after a certain amount of time.

12 So, I mean, maybe it should be analyzed  
13 like high-level waste, you know, in terms of having a  
14 longer performance period.

15 I know that -- you know, I don't disagree  
16 with your argument, you know, regarding society and  
17 all the other things. But, you know, it is certainly  
18 a special case, and probably should be handled  
19 separately and have a lot more engineered -- or  
20 engineered or natural features in terms of where it  
21 gets disposed.

22 MR. SMITH: Thank you for your comment.

23 Lisa?

24 MS. EDWARDS: I think of some of what Bill  
25 talked about gets at the crux of the matter. We know

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1 what's being generated in the United States, and  
2 presumably around the world. So it's out there, and  
3 it's being stored someplace.

4 One of the questions behind this rule is,  
5 can we dispose of it in a shallow land disposal  
6 facility?

7 If the risk-informed technical data says  
8 no, then let's put that data forward and say, it's not  
9 suitable for near-surface disposal, and defend that  
10 position, and then deal with that.

11 If it is suitable for near-surface  
12 disposal, then let's create a regulation that will  
13 clearly outline the objectives so that they can be met  
14 and demonstrated and not open the door to endless  
15 objections that, in effect, result in non-  
16 implementation of the rule.

17 It's a tough call. But if I'm reading  
18 between the lines and your technical analysis has  
19 reached a conclusion that it's not appropriate for  
20 near surface disposal, then we have to have the  
21 courage to stand up and say that and defend it.

22 If we haven't reached that conclusion,  
23 then I think we need to respond to some of the  
24 comments in the rule that I think what people are  
25 seeing here is that this type of rule, you'll never be

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1 able to get to the end point and successfully use the  
2 rule for disposal of the waste in near-surface  
3 disposal.

4 MR. LESLIE: Thank you, Lisa.

5 And Larry, you had a comment?

6 MR. CAMPER: Yes. Larry Camper.

7 Lisa, let me try to address your comment.

8 Very good comment, thank you.

9 When the staff was given the initial  
10 assignment to address this question, there is a large  
11 quantity of depleted uranium coming out of the LES  
12 here, the first question that the staff challenged  
13 itself with was whether or not large quantities of  
14 depleted uranium were suitable for near-surface  
15 disposal.

16 That's where we started. That was the  
17 right question and you're right on the mark.

18 What our analysis showed us, and we  
19 articulated that, in section 08-0147, was that yes, it  
20 is suitable for near-surface disposal, albeit under  
21 certain conditions. For example, deeper disposal or  
22 with a radon barrier, per our analysis, has not shown  
23 that it was suitable for near-surface disposal. We  
24 still had to go back to the Commission, and so we need  
25 to look at this from a different angle.

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1           So what you see now, I think that may be  
2 causing some of what you refer to, is an attempt by  
3 staff to address the point that it is suitable for  
4 near-surface disposal, albeit under certain  
5 conditions.

6           And you are right, and Dave Esh, Dr. Esh  
7 made this point in his comments that, do not assume,  
8 one should not assume that a site-specific performance  
9 assessment will, in the final analysis, result in the  
10 fact that unlimited quantities of depleted uranium can  
11 be disposed of in any given site.

12           The performance assessment will take you  
13 where the science takes you for the performance of  
14 that particular site.

15           But what we are trying to do is to  
16 sprinkle into this particular rule-making initiative  
17 the point that we made way back in '08 or '07, and  
18 that analysis was that it is suitable, but albeit,  
19 under certain conditions.

20           So I wanted to offer that clarification,  
21 because you raise an extremely good point, and you  
22 raise the very first point that challenged the status  
23 back in 2008.

24           MR. LESLIE: Thank you, Larry.

25           MR. SMITH: Are there any -- we have one

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1 more comment. One more comment?

2 MR. DORNSIFE: Bill Dornsife, Waste  
3 Control Systems.

4 Maybe that discussion is a good way to  
5 deal with this -- what happens after 20,000 years when  
6 you're looking at peaks. Maybe that should be -- the  
7 purpose of that should be to set inventory limits,  
8 just like the guidance does now.

9 Now, I don't know what standard you want  
10 to use for setting those inventory limits, but I think  
11 that would be a very useful way to deal with that  
12 issue.

13 MR. SMITH: Thank you.

14 Is there anyone on the bridge line who  
15 would like to leave a comment?

16 Lisa?

17 MS. EDWARDS: Lisa Edwards with EPRI.

18 Larry, kind of in response to the comments  
19 -- the information you provided, so what I see, what  
20 I'm a little concerned about is we have this unique  
21 waste stream and depleted uranium where activity builds  
22 in over time, which is different than most of the  
23 commercial low-level waste that is generated, which is  
24 really, per the vast majority of the waste, is at peak  
25 activity at the post of disposal. It only decays,

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1 more or less, with the majority of the radionuclides  
2 from thereon.

3 And in an attempt to address the depleted  
4 uranium issue, you proposed language that appears on  
5 the surface it needs to be applied to all waste, and  
6 there are additional burdens that are associated with  
7 applying those requirements to all waste.

8 And those burdens aren't free. You know,  
9 it costs a lot of money to dispose of low-level waste.

10 It affects the cost of our electricity, and people  
11 out there care about that.

12 So I want burdens that are necessary for  
13 the disposal to be protective to be in place, whatever  
14 they cost, but I don't want new burdens introduced  
15 that are not necessary.

16 MR. LESLIE: Thank you, Lisa.

17 I think Dave had a comment.

18 DR. ESH: Yes. This is Dave Esh from NRC.

19 And I just want to add a clarification that -- as  
20 Larry's exactly right.

21 It's not just concentration, but it's  
22 quantity that can drive the risk. So, I find it hard  
23 to say, categorically deny or ban a certain class of  
24 material without bringing that idea into the  
25 conversation, because a disposal site may, through the

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1 analysis and decision-making process, you may  
2 determine it can take some quantity of material, and  
3 just because it's named a certain type of waste  
4 doesn't mean that it can't safely be taken.

5 And what I think about is, you know, you  
6 may have material that is contaminated with small  
7 quantities of depleted uranium. Does that mean you  
8 would say that you can't take that material?

9 And I don't think that's right. I think  
10 if the risk is low, you should be able to take that  
11 material.

12 And then in terms of the issue of defining  
13 what this applies to, we discussed that in detail. It  
14 was a good comment, and we greatly appreciate your  
15 feedback on that.

16 What I would ask for you to consider is,  
17 you know, the reason why we're doing this rule-making  
18 is we have a waste stream like depleted uranium that  
19 was different from, in its characteristics, what was  
20 anticipated.

21 Now, it's not the only waste stream that's  
22 different than anticipated. Right now, we're  
23 undergoing a reprocessing rulemaking that may generate  
24 materials that may be different in quantity and  
25 concentration than was anticipated back in the early

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1 `80s.

2 Likewise, blended wastes are different  
3 than what was envisioned when the EIS was done,  
4 because it was assumed in the waste classification  
5 tables that not all waste would be at the waste  
6 classification limits.

7 Those are just three examples. But, so  
8 when we talked about it internally, we said, we don't  
9 see a good way to be smart enough and make this  
10 comprehensive list of what this -- what these other  
11 criteria or analysis should apply to.

12 We'll just apply it to everything, and try  
13 to provide some flexibility for those people that are  
14 dealing with the 90 percent typical scenario that they  
15 don't get into this extra burden that you talked  
16 about.

17 We agree strongly also that the burdens  
18 should only -- we have to be smart about it, and the  
19 burdens should only be implied when warranted, and so  
20 this process, hopefully, the regulatory criteria, and  
21 we can get your feedback on it, the regulatory  
22 criteria should define when you need that extra burden  
23 and when you don't.

24 MR. SMITH: Thank you.

25 MR. MAGETTE: I think -- this is Tom

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1 Magette with Energy Solutions.

2 I think that's a good point, David, and I  
3 think within the NRC and outside the agency, a lot of  
4 people looked at the generic notion of a unique waste  
5 stream rule making as something that was an  
6 improvement rather than a one-off constantly, I'm  
7 beginning to wonder if maybe that is the case, because  
8 two of the three that you mentioned, the blended waste  
9 and the potential waste stream from reprocessing  
10 likely are not going to pose the kind of challenges --  
11 well, certainly, in one case, doesn't, and in the  
12 second case, could easily be limited so that it  
13 doesn't.

14 But, you know, the reprocessing waste  
15 stream that is likely to be low-level waste just by  
16 virtue of a definition have been called high-level  
17 waste, and so being able to capture them as low-level  
18 waste is a wording problem.

19 Blended waste -- no single package of  
20 blended waste poses a unique hazard. It's only if you  
21 have lots of it in close proximity.

22 But here again, you can deal with that in  
23 terms of a time frame with a much shorter time frame.

24 So it looks to me like we are looking at  
25 at least one unique stream that requires some level of

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1 differentiation. And the more I read, the more I  
2 listen, the more I think about this, the more I see  
3 unintended consequences, potentially rising to the  
4 level of a problem like what Lisa just addressed,  
5 without repeating what she said.

6 MR. SMITH: Thank you. Would anyone  
7 calling into the line like to make a comment?

8 Go ahead.

9 MR. DORNISIFE: This is Bill Dornsife,  
10 Waste Control Specialists.

11 You know, on the DU issue, one of the  
12 analogies that you may want to look at is the amount  
13 of DU that's exempt from licensing.

14 Has NRC ever, you know, I mean, people can  
15 literally do whatever they want with exempt material.

16 Now, luckily, most of the people that have  
17 counterweights that are used in aircraft at least send  
18 them to a RCRA facility for disposal of exempt  
19 materials.

20 Now, but there's no limit on the amount of  
21 that material that can be disposed of. I mean, should  
22 there be? You know, I don't know. I mean, has NRC  
23 ever looked at that? I mean, I can tell you, we  
24 disposed of quite a bit of exempt DU at our RCRA  
25 disposal facility.

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1 MR. SMITH: Thank you.

2 Again, anyone calling into a line that  
3 would like to make a comment?

4 Are there any more comments in the room?

5 Okay, good, thank you. We have an hour  
6 allotted for lunch, so that will put us back here  
7 about 12:45.

8 We'd ask everyone to return at that time  
9 frame, and then we'll take comments on the period of  
10 performance.

11 (Whereupon, the above-entitled matter went  
12 off the record at 11:43 a.m. and resumed at 1:02 p.m.)

13 MR. LESLIE: Good afternoon. This is  
14 Brett Leslie, the current facilitator for the meeting  
15 you've been attending. I want to welcome everyone  
16 back and I understand that the people on the line are  
17 really having difficulty hearing the commenters and  
18 so not only are you going to have more time but we're  
19 going to give you two options. You can come up and  
20 sit exactly where Priya is sitting and speak into that  
21 mic so long as you don't mind a hand on the shoulder  
22 when you get to your 10-minute limit, or you can come  
23 up and use the standing mic. Again we'll give you 10  
24 minutes and if you don't mind us coming up and you'll  
25 - we'll have more than enough time I think this

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1 afternoon for everyone to do 10 minutes, go to the  
2 phone line and then come back for more comments. But  
3 these handheld mics, they literally almost have to be  
4 on your lips and that's not the most hygienic and  
5 certainly I don't think John Greeves appreciated me  
6 trying to stuff this microphone in his mouth. So kind  
7 of with that as a background, so even though we have  
8 the ground rules saying that we're using microphones,  
9 we're not going to try to use these handheld mics  
10 except for me, I'll use one and you've got the whole  
11 thing.

12 A couple of things. I would appreciate  
13 everyone's thoughtful input in the morning session.  
14 And George is not taking the afternoon off but he's  
15 going to be in the back helping me ensure people get  
16 up here and identify who's going to be commenting.  
17 Again, I'm going to go through the ground rules  
18 because I can't stress it enough. There are people on  
19 the bridge lines who are shuffling papers and having  
20 conversations and we can hear them, everyone can hear  
21 them. So if you're on a phone that doesn't have mute  
22 stop working unfortunately, stop shuffling papers.  
23 It's really distracting for us. And we'd like to have  
24 respect for all participants both on the phone line  
25 and here, and so we're trying to accommodate the

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1 people on the phone by requesting the people here to  
2 use better mics and so I'd just like to ask people on  
3 the phone to kind of respect the people here who are  
4 also trying to listen.

5 Stakeholder feedback. One of the things  
6 that we did talk about at the very beginning is we  
7 have meeting feedback forms. And so if you didn't  
8 pick one up earlier and you want to comment they're  
9 still out on the table. I have some here. We're also  
10 using the speaker comment cards and I'll - the way  
11 we'll run this afternoon's meeting is, again, we're  
12 going to be focused not so much on the rule language  
13 but on the period of performance. And I'll start with  
14 the people here in the room and then we'll go to the  
15 people on the bridge. Before we get into the comment  
16 period I want to ask the people on the bridge to one  
17 by one identify themselves so I'm going to turn to the  
18 bridge and ask who's on the line.

19 MS. O'DELL: Maureen O'Dell.

20 MR. LESLIE: Thank you, Maureen. Who  
21 else? Is anyone else on the line?

22 MR. SEITZ: Roger Seitz.

23 MS. FORNASH: Elizabeth Fornash from DOE  
24 EM.

25 MR. LESLIE: So I heard Roger Seitz and

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1 someone from DOE.

2 MS. FORNASH: Elizabeth Fornash.

3 MR. LESLIE: Thank you, Elizabeth. Anyone  
4 else on the bridge line?

5 MS. TREHAFANEL: Jean Trehafael, NRC.

6 MR. LESLIE: Okay, Jean. Anyone else?

7 MR. KLEBE: Michael Klebe, state of  
8 Illinois.

9 MR. LESLIE: Okay, Michael. Thank you  
10 very much. Anyone else on the line?

11 MR. JANATI: Rich Janati, Pennsylvania  
12 DEP.

13 MR. LESLIE: Is that Rich? Okay.

14 MR. JANATI: Yes.

15 MR. LESLIE: Anyone else?

16 MR. LUNDBERG: Rusty Lundberg, Utah.

17 MR. LESLIE: Thank you, Rusty. Anyone  
18 else beyond the people that have already talked?

19 MR. SCHULTHEISZ: Dan Schultheisz, EPA.

20 MR. LESLIE: Dan, thanks. Last time for  
21 people on the bridge, anyone else? Okay. So before  
22 we get started I think it's worthwhile thinking back  
23 to something that Larry said early on. Right now you  
24 have out in front of you some draft regulatory  
25 language and those documents are out there. There are

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1 written comments. Due date is June 18th. But one of  
2 the things Larry asked and I like the way he put it.  
3 If not 20,000 years, what and why. So that's one of  
4 the things that the staff really would like input on.

5 So again, especially this is important for the period  
6 of performance discussion this afternoon. So I guess  
7 I'm going to ask if there's someone who wants to go  
8 first here in the room. Linda? And again, you can  
9 either stand up or sit down and we'll let you know if  
10 we can't hear you. Thank you, Linda. And don't  
11 forget to identify yourself for the record.

12 MS. SUTTORA: Okay. Can you hear me?  
13 Okay. Linda Suttora, and I work for the Department of  
14 Energy in the Office of Environmental Management. And  
15 I also appreciate, like others, the opportunity to  
16 comment on preliminary deliberations by the NRC staff  
17 and for your public comment prior to the release of  
18 the actual proposed regulations in the fall. And I do  
19 welcome the opportunity to provide my thoughts at  
20 today's meeting concerning the potential revisions for  
21 10 CFR Part 61.

22 To begin, I note that my comments today do  
23 not constitute the official DOE position on the  
24 potential wording of rule changes. Instead what I'd  
25 like to do today is share with you DOE's approach to

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1 the same issues which we've developed and tested over  
2 a series of decades. DOE's approach is set forth in  
3 DOE Order 435.1 which is DOE's radioactive waste  
4 management order because DOE is self-regulating for  
5 radioactive waste. And the way DOE orders work is  
6 that the order itself says go forth and conquer in the  
7 manual. The DOE manual 435.1 actually provides the  
8 requirements. So you'll see I might actually mention  
9 DOE manual but actually they're essentially the same  
10 thing and they're both required.

11 In addition to the order and the manual we  
12 also have guidance, and policies and practice. So  
13 you'll - several of our things that we do right now  
14 are not in the requirements but we do them because  
15 over time we've discovered they're important to do.  
16 And they're in one guidance document or another. And  
17 we in fact are currently in the process of updating  
18 our DOE order at the same time as 10 CFR is being  
19 revised and we would like - we thought that this was a  
20 good opportunity to harmonize the regulations of our  
21 two agencies to bring about a more consistent and  
22 comprehensive national approach for regulating the  
23 nation's low-level waste disposal.

24 In kind of a risk-informed approach we  
25 agreed that a thorough and well-supported site-

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1 specific understanding of a disposal facility is key  
2 to assessing its safety. A performance assessment for  
3 all waste management - I'm sorry, for all waste  
4 streams to be disposed at a facility provides such an  
5 understanding. As you may know, DOE assesses and  
6 approves the use of DOE-owned low-level waste disposal  
7 facilities at a number of its sites across the  
8 country. The DOE process requires a site-specific  
9 performance assessment. The department has developed  
10 guidance and standard practice over many years as I  
11 mentioned before and in terms of developing the  
12 bounding conditions and assumptions used in  
13 performance assessments. The DOE practice falls well  
14 within the range of approaches used currently in  
15 commercial facilities licensed by NRC's agreement  
16 states. So we have a number of key assumptions that  
17 are consistent across what you're proposing in  
18 preliminary deliberations that are consistent with the  
19 way DOE does things, such as a time of compliance.  
20 You're proposing a time of compliance a little bit  
21 longer than we currently use. The comparison of the  
22 projected facility performance against performance  
23 objectives, for DOE we use a 1,000-year period  
24 primarily in view of the uncertainties in long-term  
25 projections and their hypothetical nature. However,

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1 sensitivity and uncertainty analyses are conducted and  
2 the projected level in time of a maximum dose, the  
3 peak dose, is projected. This information enhances  
4 the understanding of a disposal facility and can also  
5 be useful in evaluating alternative disposal  
6 facilities that are otherwise equal.

7 Another assumption that we incorporate is  
8 point of compliance. The point of compliance normally  
9 corresponds to the highest point of projected dose or  
10 concentration beyond the buffer zone surrounding  
11 waste. This buffer zone is often 100 meters but it  
12 may be more or less if justified by site-specific  
13 conditions, yet it never extends beyond the boundary  
14 of the land projected to be under permanent control by  
15 DOE. Another assumption is compliance demonstration.

16 A performance assessment is a projection of  
17 reasonable, reasonably foreseeable future events.  
18 That's an important point, reasonably foreseeable  
19 future events. Proof of compliance cannot be attained  
20 in the normal sense of the word. We seek a reasonable  
21 expectation of future compliance taking into account  
22 the uncertainties inherent in projections over long  
23 time periods. In addition, DOE's performance  
24 assessments must include demonstrations that projected  
25 releases of radionuclides to the environment will be

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1 maintained as low as reasonably achievable, another  
2 important point.

3 Inadvertent intruder assessments. We  
4 analyze potential inadvertent human intrusion to  
5 identify reasonable measures that can be implemented  
6 to reduce or control the possible consequences. In  
7 fact, NRC's preliminary proposed inadvertent intruder  
8 dose limit is one of those areas which provides an  
9 opportunity for a harmonized national approach.

10 Assessments regarding human activities,  
11 another important point mentioned this morning.  
12 Projecting disposal facility performance and analyzing  
13 potential inadvertent intrusion entail consideration  
14 of the hypothetical future human, how they behave,  
15 what technologies or medical sciences will be at their  
16 disposal, and other societal factors are among the  
17 greatest uncertainties in long-term performance  
18 assessment. It's not reasonable or necessary to  
19 consider the most extreme bounding scenario. Rather,  
20 we consider a set of normal activities consistent with  
21 current local practices and conditions. For example,  
22 an example that is, Idaho site. When a well-digger  
23 drills into the ground to reach groundwater they don't  
24 - it's not unanticipated that they would hit rock so  
25 their well-digging equipment can anticipate that it's

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1 much stronger and they'll dig through. And if they  
2 hit a cement monolith like DOE has left underground at  
3 Idaho they will keep digging and so in our performance  
4 assessment we actually analyze the scenario of a human  
5 intruder digging through the cement monolith.  
6 However, South Carolina has very sandy, loose soil.  
7 Our intruder scenario does not anticipate that an  
8 inadvertent intruder would dig through a cement  
9 monolith it came across because current practices in  
10 that state are to move to the side until you don't hit  
11 rock. So those are the kinds of really site-specific  
12 natural, local current practices that we incorporate  
13 into our performance assessments.

14 Another one is extrapolation to future  
15 environmental conditions. Performance assessment  
16 requires projections of natural processes and events.

17 Over very long periods of time there are hypothetical  
18 events that may or may not occur or may be extremely  
19 unlikely. It's DOE's intent to analyze the reasonably  
20 expected behavior of a disposal system. Long-term  
21 calculations are based on a projection of current site  
22 conditions, including present rates of natural  
23 processes, allowing for variation in the processes and  
24 including episodic events such as flooding.

25 Another issue that we incorporate is the

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1 treatment of the radon dose in our PAs. We consider  
2 them separately. It's a normal radiological  
3 protection practice, consider radon and its decay  
4 products and air separately from the impact of other  
5 radionuclides. DOE applies performance measures to  
6 limit radon flux at the burial ground surface and to  
7 limit air concentrations offsite.

8 Yet another assumption we make is for  
9 unique waste streams. We take a performance-based  
10 approach. We conduct what we call special analyses.  
11 For those wastes that were not anticipated when the  
12 original performance assessment was written for that  
13 specific disposal facility. DOE analyzes the unique  
14 waste stream's radioactive properties against the  
15 disposal facility's waste acceptance criteria and the  
16 bounding analyses provided in the facility's  
17 performance assessment to calculate whether placing  
18 that specific unique waste stream would impact the  
19 performance objectives of the performance assessment.

20 We dispose of unique waste streams in facilities  
21 where there is no identified impact to the performance  
22 objectives.

23 And finally, and this is another issue  
24 that we think should be incorporated into Part 61 when  
25 it is revised, is the thought of performance

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1 assessment maintenance. DOE considers a performance  
2 assessment to be a living document. Each performance  
3 assessment includes a section describing research to  
4 be conducted over the course of the next year and out-  
5 years, and results of those research projects are used  
6 in assessing the continuing validity of assumptions in  
7 the performance assessment. We conduct an annual view  
8 of the performance assessment to determine whether any  
9 new information that has been developed over the past  
10 year is significant enough to question the validity of  
11 the current conditions and conclusions of the current  
12 performance assessment. If there is a question, a  
13 revision to the performance assessment is performed  
14 and it is treated almost as a brand new performance  
15 assessment. It goes through the rigor and review of  
16 the DOE system for performance assessments. There are  
17 other triggers. It could, if we redesign facility  
18 disposal cells we can recognize that the current  
19 assumptions that were in the current performance  
20 assessment aren't valid anymore so we need to revise  
21 the performance assessment. And there's several other  
22 things, maybe site groundwater systems are better  
23 understood and we recognize that the PA doesn't work  
24 anymore. So we revise the performance assessment and  
25 we redo the entire analyses. And a subset of the

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1 performance objectives could - that we would just make  
2 sure that the performance objectives were never  
3 compromised.

4           Once the performance assessment is  
5 approved at the site level, this is another important  
6 point is the level of rigor at DOE. We start with the  
7 site produces it. Other folks on the site do a peer  
8 review of that. Once the peer review is complete at  
9 the DOE site it goes to the headquarters organization  
10 that is responsible for doing a national expert,  
11 technical expert review and we bring experts from  
12 other DOE site, from industry and from academia to  
13 conduct an independent review prior to management  
14 approval. So the revisions to existing performance  
15 assessments trigger the same level as the initial  
16 performance assessment. So again I thank you, that's  
17 all I had to say. I appreciate being given the  
18 opportunity to speak today and I hope you consider the  
19 descriptions of the DOE processes helpful during the  
20 deliberations on your revisions of 10 CFR Part 61.

21           MR. LESLIE: Thank you, Linda. Was that  
22 better for the people on the bridge?

23           PARTICIPANT: Absolutely.

24           MR. LESLIE: Okay. So we'll keep that in  
25 mind. One comment on the agenda which I didn't talk

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1 about. Right now it's just slated for one long public  
2 comment period. I'm thinking that we might be done by  
3 2:30 so if we're not done by 2:30 that's when we'll  
4 take a break. So we'll stay as long as people have  
5 comments because we need to hear what you have to say.

6 Were there other people here in the room that wanted  
7 to make a comment? If you could raise your hand and  
8 then I'll. Lisa, do you want to? Lisa, I'll give you  
9 a choice. You can have it right next to your lips,  
10 sit at the table or stand up. And we'll give you 10  
11 minutes. Thank you.

12 MS. EDWARDS: I appreciated your comment.

13 I'd like to be able to ask you questions. How do you  
14 think that might apply for specific waste streams like  
15 the depleted uranium. But I do have a few general  
16 comments. In slide 7 in your presentation, Dave, in  
17 David Esh's presentation there's kind of a diagram  
18 there that shows the various activity levels that  
19 remain after a certain period of time. In general we  
20 proposed a 20,000-year performance assessment period,  
21 but when I look at the waste characteristics slide in  
22 slide 7, after year 1,000 until you get out to close  
23 to it looks to me 50 or 60,000 years I don't see that  
24 there's a substantial difference between 1,000 and  
25 20,000 and the activity that is present in the site

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1 for either the depleted uranium waste stream or the  
2 lower activity - or shorter lived half-life waste.  
3 And for that reason I would propose consideration for  
4 1,000 years instead of the 20,000 and that would also  
5 harmonize more closely with what the DOE has in place  
6 in their regulations which I think whenever we develop  
7 something that there's more consistency between how  
8 those same types of waste are treated by different  
9 organizations it removes some of the confusion that  
10 gets caused in the public sector.

11 Second, I want to just respond, David, to  
12 a comment you made about risk analysis that compared  
13 the risk of death from 25mrem per year to the risk of  
14 death from a deer or hitting a deer. With all due  
15 respect to that comparison, I don't find that a valid  
16 comparison. I know of many people who have died from  
17 hitting animals with their vehicles and if we go to  
18 animals instead of just deer I have an aunt that died  
19 from hitting a car - I mean, from hitting a cow. I  
20 know of no evidence that suggests that we know of any  
21 deaths ever from 25mrem of exposure and I think that  
22 the comparison that you laid out is a partial basis  
23 for a longer term look. From a performance analysis  
24 was partially based upon that and I think it was  
25 misleading.

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1 I do think that if you're going to require  
2 a dose calculation for peak dose no matter what year  
3 it occurs and to be performed then I think you need to  
4 provide a context for the dose pathway assumptions.  
5 In other words, I'm going to reiterate some things  
6 that we talked about on the break. But for the  
7 record, when people are doing dose calculations they  
8 need to have a receptor pathway. And if you don't  
9 provide context of reasonable assumptions to include  
10 in those dose receptor pathways and you put it in a  
11 time frame that is so far out that you really have no  
12 reasonable basis for prediction of behavior or use of  
13 the land 10 or 20,000 years from now, the only thing  
14 you can do is assume the worst case scenario.

15 And when you look at - you're shaking your  
16 head no. I would challenge that our practices that  
17 are currently used within the industry establish  
18 pretty clearly that unless you have a strong basis to  
19 support something less conservative than the worst  
20 case scenario, okay, something that is more  
21 realistically based, you have to have a strong  
22 technical basis or you by default revert to the worst  
23 case scenario.

24 So for instance, in a particular dose  
25 pathway surrounding a nuclear power plant, if you have

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1 a garden within the dose pathway for that plant you  
2 will assume worst case 100 percent consumption of the  
3 vegetables from that garden in your dose pathway. And  
4 if you want to use something less than that then you  
5 must provide a technical basis of why something less  
6 than that is reasonable.

7 In most cases that data can be gathered,  
8 but it can be burdensome to gather the data and have  
9 it be substantive enough to be defensible. So it goes  
10 into more detailed communication with those landowners  
11 to establish real land use criteria. It's done  
12 realtime and it's updated typically quite frequently,  
13 as often as once a year. So when you look at a dose  
14 pathway that's 1,000 or 10,000 or 20,000 years away I  
15 don't see a clear pathway defining a realistic  
16 scenario for a dose pathway which means you'll revert  
17 to worst case scenarios. And when you combine that  
18 with already assuming a probability of 1 of intrusion.

19 Did I say that before? That a probability of 1 of  
20 intrusion is hard to believe? Two, that the  
21 probability of intrusion at 100 years and one day is  
22 1, and three, that you add in you're going to assume  
23 the worst case scenario. We're moving a long ways  
24 away from being risk-informed or realistic and  
25 credible in the scenarios that we're producing.

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1 That's all I'm going to say on that because I think  
2 I've maybe driven that point home more than once now,  
3 but I think it is very important.

4           The next point that I'd like to make is  
5 that there were some references about it's important  
6 to consider our social responsibility to future  
7 generations, and that in order to do that we need to  
8 look out to 10 or 20,000 years. And that I think some  
9 of the results may land us in a place where we orphan  
10 waste streams. And I would offer for the group's  
11 consideration that my perspective on responsibility to  
12 the future generations is slightly different. I think  
13 the responsibility for future generations is responded  
14 to most effectively by not orphaning waste, providing  
15 a regulatory structure for responsible and safe  
16 disposal of waste, and not orphan any waste streams.  
17 Because 10 or 20,000 years from now the waste we've  
18 generated is going to be somewhere and the question is  
19 is do you provide a better environment for future  
20 generations if that waste is disposed of in a  
21 centralized and regulated disposal facility or if you  
22 leave it orphaned out in somewhere in the public.  
23 History has shown us that the events that we've had  
24 have come not associated with actual disposal of  
25 waste. It has come in situations where waste has been

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1 abandoned. And I think it is reasonable to draw a  
2 corollary to that that again, whatever limitations we  
3 may have in understanding what's going to happen 10 or  
4 20,000 years now at a particular disposal site, it's  
5 at least as good and probably better than the  
6 scenarios you would imagine 10 or 20,000 years from  
7 now with orphan waste streams.

8 And finally, in the DU - original concept  
9 behind the DU rulemaking, my understanding was that it  
10 was a fairly limited scope rulemaking. What I've seen  
11 put in the wording is that this is waste stream  
12 neutral which really implies a more or less  
13 comprehensive revision to Part 61 which includes new  
14 performance objectives and at least from the current  
15 wording could be interpreted as applying to all waste  
16 streams. And as such, I think that there is a  
17 requirement for a NEPA assessment or EIS to be  
18 performed before such regulation goes into place. And  
19 I just want clarification to understand that that is  
20 the expectation that a NEPA assessment or what I call  
21 an EIS would be performed before the rule is actually  
22 finalized.

23 MR. LESLIE: Great question, Lisa. Are  
24 you done?

25 MS. EDWARDS: I am.

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1 MR. MCKENNEY: This is Chris McKenney.  
2 I'm chief, Performance Assessment Branch for NRC.  
3 First on the NEPA analysis. There is a NEPA analysis  
4 associated with the rule. Start over. Chris  
5 McKenney, Performance Assessments Branch of the  
6 Nuclear Regulatory Commission. The - on the NEPA  
7 question there will be a NEPA analysis with the  
8 proposed rule. Again, since it's preliminary, much  
9 like the statements of consideration every rule does  
10 go through a NEPA analysis. At this time we're  
11 currently evaluating it through the steps of it did  
12 not require to start out with an environmental impact.

13 So we evaluate through that system, but we are doing  
14 an environmental assessment on the rule. The - yes,  
15 there's a two-step process. Some things require large  
16 environmental impact statements immediately, others go  
17 through an assessment that says do you do an  
18 environmental assessment. Right. Basically there's a  
19 way to check and see how big does your environmental  
20 assessment have to be.

21 The - on the first part is is that when  
22 you're talking about receptors and stuff like that, if  
23 you look at our current guidance in the area of both  
24 low-level waste, high-level waste - actually not both,  
25 there's three so it's several - and in decommissioning

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1 we look at average them as a critical group, we look  
2 at reasonable land uses in our guidance space which is  
3 one of the reasons why John Greeves brought up  
4 previously that he thought that to strengthen that  
5 would be to bring that into the text language  
6 actually. But we do not have as a first cut a person  
7 standing sucking up leachate and that sort of thing.  
8 Also, in our - similar to low-level waste reviews  
9 under our authorities under the National Defense Act  
10 of - the Ronald Reagan Defense Act 3116 which we do  
11 some monitoring of DOE activities we have definitely  
12 explored with that where we don't, again, make worst  
13 case assumptions for assessments of receptors during  
14 that entire analysis time period.

15 MS. EDWARDS: For intruders.

16 MR. MCKENNEY: Actually for both, for both  
17 - as far as a release from the facility or for the  
18 intruder.

19 MS. EDWARDS: How could an intruder be in  
20 -

21 MR. LESLIE: Because we're having - could  
22 you repeat your question, Lisa?

23 MS. EDWARDS: How can the - how is an  
24 intruder dose pathway anything less than worst case?  
25 You assume he drills down and encounters the waste and

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1 then - with the things that I've seen he stays with  
2 that waste 24/7 for the whole year.

3 MR. MCKENNEY: No, he doesn't. He - I'm  
4 saying that for his activities and other things like  
5 that we don't assume worst case. He doesn't sit on  
6 the waste, he doesn't do that 24/7. You don't have to  
7 go to that level of assumption of receptor activities.

8 And so the - it's just not that worst - it's not the  
9 worst, worst, worst of everything in the assessments.

10 You may be - and from one vision correct is a  
11 statement that we do assume that to look at what would  
12 happen if an intruder happened at any time after  
13 institution of controls could be relied on, but beyond  
14 that. Our receptor of what human activities are in  
15 the future are largely based off of what are  
16 reasonable activities in the local area today.

17 MR. LESLIE: Thanks for going up to the  
18 first mic and answering that question.

19 DR. ESH: So Brett, can I add a couple of  
20 things?

21 MR. LESLIE: Sure. Absolutely.

22 DR. ESH: This is Dave Esh, NRC. As Chris  
23 indicated, defining the receptors and the  
24 characteristics of those receptors, we aren't assuming  
25 the worst case for all their behavior characteristics,

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1 consumption parameters, et cetera. So if they're  
2 envisioned to have a garden and grow vegetables,  
3 they'll have a local fraction and a non-local  
4 fraction, or if they're using water they may have some  
5 water from a local source and they may consume bottled  
6 water and other products that they get some of their  
7 fluids from. They'll have an onsite occupancy time  
8 and an offsite occupancy time where they're  
9 essentially getting no dose. So in the dose estimates  
10 that we do in waste disposal and decommissioning and  
11 the types of programs Chris mentioned, it's not the  
12 worst case person you can envision.

13 We do generally believe that you need to  
14 consider the characteristics of the intruder and the  
15 characteristics of waste in defining your intruder in  
16 the intruder scenario, but the probability is not 1.  
17 The probability is 1 only if you were to apply the  
18 same dose limits to the intruder as you are to a  
19 member of the public. We are recommending in here and  
20 in the EIS that was originally done for 61, apply a  
21 500mrem dose limit; that implies roughly a 5 percent  
22 probability of that intruder scenario happening by the  
23 difference in the dose limits. So consider that  
24 whenever you're thinking about intruders and the  
25 likelihood of the intruders, et cetera. We

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1 acknowledge that the intruder calculation is more  
2 dependent on the behavior of people and what they may  
3 be doing sometime in the future which is more  
4 difficult to define.

5 It's hard to define exactly what people  
6 are going to be doing and when they're going to be  
7 doing it, and so we err on a reasonably conservative  
8 approach for what we believe. Now if you think about  
9 right here where we're sitting and what was done here  
10 200 years ago and 400 years ago, when we're talking  
11 hundreds of years or thousands of years, the land use  
12 today is markedly different than the land use was 200  
13 or 400 years ago. So if you're putting a disposal  
14 facility in someplace, one of our criteria are that  
15 you choose a low population area and you choose an  
16 area that has limited natural resources. We hope  
17 those things combined and the state ownership, federal  
18 ownership of a disposal facility, all those things  
19 combined contribute to greatly reducing the likelihood  
20 that this ever happens. But we can't ensure that it  
21 won't happen so we go through a regulatory process of  
22 trying to assess what happens if this unexpected or  
23 unlikely thing happens, this intruder scenario, and we  
24 apply a higher dose limit for it. That's the context  
25 for kind of the analysis under 61.42.

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1           Regarding the slide 7 and the waste  
2 characteristics, I should have said this during my  
3 presentation but of course we have the log-log plot on  
4 the left and linear-linear on the right. They have  
5 different characteristics. And also, the risks that  
6 you get out of these calculations are not necessarily  
7 determined by the bulk activity. The risk can be  
8 driven by, say you have iodine-129 in the disposal  
9 facility. It's not going to show up as moving these  
10 activity curves anywhere, but that could be the driver  
11 of the risk. So in performance assessments you're  
12 looking at the very few radionuclides and they have  
13 mobility and exit the facility, you're not seeing the  
14 risk from the bulk of the activity. So I don't want  
15 people to misinterpret the waste characteristic plots  
16 is what I'm saying. That represents the total  
17 activity in the facility, but the bulk of that  
18 activity may never cause risk. So when you start  
19 talking about risk and frameworks for analysis and  
20 those sorts of things, the waste characteristic charts  
21 can be misleading.

22           MR. LESLIE: Thanks for the clarification.

23           Lisa, thanks for your comments. Bill and then John.  
24           Again, Bill you can sit down if you feel more  
25 comfortable sitting down or standing up. And again,

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1 10 minutes thereabouts.

2 MR. DORNSIFE: I just want to elaborate on  
3 some of the points I made this morning regarding the  
4 20,000-year performance time. I think it's a time  
5 that's trying to be all things to all waste streams  
6 and I don't think it applies to all waste streams. I  
7 mean, I think 95 percent of the waste streams or maybe  
8 even more, a 1,000-year performance period is quite  
9 satisfactory. Now, that doesn't mean you shouldn't be  
10 looking at peaks beyond that and what you do with  
11 those peaks I think primarily is to establish possibly  
12 inventory limits where you judge that a peak is just  
13 so high that you know even though it's remotely  
14 possible and we don't understand what might be going  
15 on at that time it just makes good societal sense to  
16 do that.

17 Now in Texas we have a 1,000-year  
18 performance time but we have to look at peaks forever  
19 and our regulator applies the 25mrem dose in terms of  
20 establishing inventory limits. And not only that, but  
21 when they did their performance they assumed worst  
22 case, you know, when they look at sensitivity studies  
23 and parameters they assumed worst case. Where are  
24 those parameters? So just to give you an example of  
25 how one regulator approaches that. So you know, I

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1 think you know there needs to be some uniformity in  
2 how a lot of these things get implemented. I don't -  
3 certainly you know in our case it's certainly very  
4 conservative. From the standpoint of reality it just  
5 doesn't make sense.

6 So I think having said that, you know, you  
7 probably need to look at the two issues differently.  
8 You need to look at the long-lived radionuclides  
9 differently than you look at the 98 percent of the  
10 other waste streams because they do create a different  
11 problem. Like I said previously you know, if you look  
12 at the toxicity in water of depleted uranium after  
13 10,000 - 20,000 years, it's no different than high-  
14 level waste. I'm not saying that means it needs to be  
15 disposed of in a geological repository, but you need  
16 to look at it differently. You need to you know maybe  
17 do a longer-term performance assessment. You may look  
18 at some of the technical requirements for disposal of  
19 that unique waste stream. You know, it has to be a  
20 lot deeper, it has to have some specific type of  
21 engineered barriers. You know, what kind of technical  
22 additional redundancy might indeed provide that level  
23 of assurance just like it does for high-level waste.

24 And I think going on - the next issue  
25 would be the intruder issue. I mean I don't disagree

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1 with the way you all imply your intruder scenario. I  
2 think your discussion, Dave, I think made a lot of  
3 sense, particularly - and I like the clarification of  
4 why you're using 500. I just didn't see anywhere.  
5 That's a good justification. But I guess, and this  
6 may sound off the wall, but has NRC ever considered  
7 deliberate intrusion? I mean, I could probably  
8 reasonably expect that it's much more probable a  
9 hundred years from now when we have scarce resources  
10 that somebody's going to know there's a huge chunk of  
11 metal down there, very high-quality metal, and they're  
12 going to want it. That probably has a higher  
13 probability than inadvertent intrusion. Now, you  
14 know, if that person who deliberately intrudes isn't  
15 properly controlled and there isn't knowledge he's  
16 doing that, just hold the ball game for that waste  
17 site. He goes in there and excavates a steam  
18 generator.

19 DR. ESH: And just for clarification,  
20 Bill, this is Dave Esh, NRC. In the original EIS the  
21 Commission basically said - I'll paraphrase, you can  
22 look at the EIS - that we don't protect or we aren't  
23 going to try to develop criteria for the advertent  
24 intruder. So somebody who deliberately is digging  
25 into a waste disposal facility and isn't supposed to

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1 be digging into a waste disposal facility, that's not  
2 something that we can speculate on exactly when,  
3 where, how it'll happen, nor do we have an obligation  
4 to try to develop criteria for that.

5 MR. DORNSIFE: I could make a very good  
6 argument that that's a higher probability, not only  
7 for low-level but also for high-level, for spent fuel.

8 I think that when you look at changes in site  
9 characteristics, you know, for this - and I like the  
10 idea very much of requiring a performance assessment  
11 not only for you know the public but also for  
12 intruders. I think that's - a site-specific  
13 performance assessment is extremely, extremely useful  
14 and needs to be done for any site or if you're making  
15 changes to waste streams that you intend to dispose  
16 of. And in fact, Linda, your idea of a performance  
17 assessment maintenance plan, we have a requirement to  
18 do that on our license. We had to submit our  
19 performance assessment maintenance plan which includes  
20 a yearly update of that performance assessment which  
21 allows us not only to look at new information that we  
22 have on site characteristics, but it also allows us to  
23 consider getting authority for new waste streams and  
24 determining that the waste streams we have disposed of  
25 based on the real data, the real inventory is in fact

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1 fine which brings me to another point and that is  
2 chlorine-36.

3 In our performance assessment, chlorine-36  
4 by far and away is the most significant radionuclide  
5 in our performance assessment. It's still less than -  
6 well less than a millirem in terms of impact and the  
7 peak is somewhere around 15,000 years, but it's the  
8 highest dose and it's also the only radionuclide that  
9 peaks before 20,000 years. But the data that we were  
10 required to use to come up with that chlorine-36 waste  
11 stream as best as we can determine went all the way  
12 back to the Part 61 EIS and it included some guidance  
13 that NRC put out. So that waste stream is so inflated  
14 that it doesn't have any reality to it. Now the  
15 problem is because it's not a class-defining  
16 radionuclide nobody looks for it. People only look in  
17 detail for those - or spend a lot of effort looking  
18 for those radionuclides that are class-defining. So I  
19 think, you're going to see on an arid site, you know,  
20 deep arid site chlorine is going to be the bad actor.

21  
22 Now what we've done and we have - hasn't  
23 been approved yet, but we suggested or we proposed  
24 using actual reactor chemistry, you know, what is the  
25 allowable ppm of chlorine in your reactor coolant

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1 system and then calculating you know what a maximum  
2 inventory in resin could be because that's primarily  
3 where it shows up. But absent that, I mean there's no  
4 good way to get data because most data manifests say  
5 there's zero chlorine-36. Let's see.

6 I think that's - oh one more thing real  
7 quickly. I did, by the way, notice I skimmed through  
8 the technical thing and that table didn't make any  
9 sense to me either. I wasn't sure why but it didn't  
10 look good. So you can - I passed the test. You had  
11 said when you were looking at the second tier where  
12 there's no dose limit that NRC would do an EA to come  
13 up with, you know, some criteria of what you did in  
14 terms of that. I mean, I'm not sure what you meant.  
15 What would be the scope of that EA, what would you  
16 look for?

17 DR. ESH: It wouldn't necessarily be an  
18 EA. It would be an environmental analyses which could  
19 be an EA or an EIA if that's appropriate.

20 MR. DORNSIFE: Okay.

21 DR. ESH: But it would look at the impacts  
22 that you may see at those later times just like any  
23 impacts that are generated from an action and assess  
24 them how they're done in the EA/EIS process. So it  
25 wouldn't be anything new or unique, but it would put

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1 the radiological impacts from disposal at those later  
2 times in the same context as other types of impacts  
3 that you evaluate in that process.

4 MR. LESLIE: Thanks for clarifying.

5 MR. DORNSIFE: And like I said before,  
6 David, that RESRAD thing you have in the technical  
7 paper just - that doesn't make any sense. I mean,  
8 looking at a disposal cell with no cover on it. There  
9 could be some very significant groundwater issues for  
10 certain parameters that occur right in that time  
11 frame.

12 MR. LESLIE: Thank you very much, Bill.  
13 John, do you want to take a crack at this? Again, you  
14 can sit up or stand down. I mean stand up or sit  
15 down.

16 MR. GREEVES: Let me comment. This is one  
17 of the best sessions that I've been to in a long time.  
18 There's actually real dialogue going on here. We  
19 talked about a lot this morning and this afternoon and  
20 I just want to - we're supposed to be talking about  
21 the compliance period so I'll get to that, but -

22 (Laughter)

23 MR. GREEVES: - there's linkage and to do  
24 compliance you've got to know what the scenario is.  
25 All of us have said that. So I'm hoping based on

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1 remarks made this morning and this afternoon by the  
2 Department of Energy that the staff sees there's a lot  
3 of folks looking for this reasonably foreseeable  
4 language in the rule. Don't - it's not going to work  
5 in guidance. You've got to give this in the rule.  
6 You need that in there. Chris McKenney stood up and  
7 said that's what we're doing under 31.16. I'm very  
8 familiar with that and the comment. I would agree,  
9 the staff has looked at realistic scenarios for the  
10 most part including the uncertainties and all the  
11 parameters. So I urge you to pay attention to what  
12 DOE said, other stakeholders, and I would look forward  
13 to the next language to include reasonably foreseeable  
14 intruder scenarios.

15           The comment also is - I made this morning  
16 about using the PA to derive a waste acceptance  
17 criteria. Bill said it about Texas. They have a  
18 provision in there. We have to update that PA and if  
19 there were inventory limits we're smarter now, we  
20 adjust, let something in the rule account for that.  
21 That waste acceptance criteria derived from the PA is  
22 what we're - more what you do in a site-specific way.

23           The - as far as both - it was interesting  
24 listening to DOE. And both approaches use a two-tier  
25 approach. I'm not sure whether everybody in the room

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1 understands that, but there is a two-tiered approach  
2 that you provided. DOE uses it. I would invite NRC  
3 and DOE to get together on what is the period of  
4 performance. They have a different number, you  
5 practice a different number, you now have a new  
6 number, 20,000k and I see that as unsettling and I  
7 would ask both of the agencies to come together and  
8 look at what a period of performance for tier one is  
9 and seek alignment on that. I think it's just  
10 disruptive to have federal agencies in different  
11 places on that.

12 One of the reasons that I would urge you  
13 to do that is there are consequences in moving this  
14 thing around. DOE has a large number of sites they've  
15 already analyzed and made commitments to their public  
16 on based on their approach. Whatever you do with this  
17 number in Part 61 there's at least six old sites out  
18 there somebody's going to start raising questions  
19 about and 31.16 effort points to these performance  
20 objectives so there's a lot riding on, and there are I  
21 think consequences in changing the - what you've used  
22 in the past to some new number like 20,000 years.

23 I sort of have the microphone. I would  
24 speak to the agreement states. I know a little, only  
25 a little bit about they requested a meeting in the

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1 fall time frame to understand these issues. I would  
2 urge any agreement state to get on the record before  
3 the fall because the NRC staff's agenda has them  
4 putting out a proposed rulemaking in the fall. So if  
5 you've got a view on these issues, whether it be the  
6 reasonably foreseeable scenarios, the period of  
7 compliance, the intruder analysis approach, I think  
8 it's, just like DOE came forward this morning and said  
9 what they've had on this, I'd like to hear what the  
10 agreement states' recommendations are before the fall.

11 Because it might color my own opinions, so anything  
12 you could do to accelerate that I think would be in  
13 order. Don't want to take a lot more time, give the  
14 podium back up to others who want to add to this. But  
15 again, thanks for conducting this session. I think  
16 it's been quite useful.

17 MR. LESLIE: Thank you, John. Tom?  
18 Continuing the trend of standing up for your point.

19 MR. MAGETTE: Thank you, I'm Tom Magette  
20 with Energy Solutions. I certainly agree with what  
21 John said about the quality of the exchange here and I  
22 appreciate the opportunity to be a part of this. I  
23 would like to start with a couple of general comments,  
24 the first of which is I'm having a hard time seeing  
25 the linkage between the language in the SRM for SECY

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1 08-0147 and the SRM for the blending to this  
2 rulemaking package. Now, I didn't really expect I  
3 would see nothing more than a new paragraph  
4 61.55(a)(9), thou shalt do a performance assessment,  
5 especially since as Dave had pointed out, you know, we  
6 ask for things like period of performance and intruder  
7 doses and updates to the performance objectives, dose  
8 methodology. So I knew it would be more than that but  
9 this is more more than I thought I might see and  
10 frankly I am wondering what exactly more you might  
11 have to do to this to have something that constitutes  
12 the comprehensive revision of Part 61 as Larry likes  
13 to talk about. And I would suggest that the comment  
14 John made and I made this morning about 61.7(c)(6), if  
15 you in fact looked at not just imposing additional  
16 requirements for what's done in the tables based on  
17 the generic assessment as insufficient, but expanded  
18 that on the other end to deriving site-specific WAC  
19 that if appropriate would even trump the tables,  
20 what's left to do. And I note from your own report  
21 looking at the options for comprehensive revision of  
22 Part 61 a large percentage of that effort is devoted  
23 to a big EIS that would replicate the waste stream  
24 analysis that was done 30 years ago. One might  
25 suggest that that's not something you ought to have to

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1 do if you're going to go to risk assess - a risk-  
2 informed performance assessment base. Why regenerate  
3 that huge volume of information, to what end? I'm not  
4 saying you wouldn't need an EIS, but I do think that's  
5 five or six FTEs that you could chop out and move on.

6 So that's one comment. I think you're pretty close  
7 to a comprehensive revision and taking another step  
8 would get you there, and then you could save an entire  
9 rulemaking, always a good thing.

10 Second, as to compatibility criteria,  
11 there are as I recall in your guidance criteria for  
12 compatibility, for selecting them. There's this  
13 thing, transboundary impacts. If you're going to have  
14 multiple waste disposal sites open how can you leave  
15 it and be consistent with your own agreement state  
16 guidelines to a variety of states to select what a  
17 performance objective is? I don't see how you can do  
18 that. So it's been suggested that that's not right.  
19 I don't see how you would even properly interpret your  
20 own guidance and get compatibility criteria in a (c)  
21 for those (b) paragraphs. And I would urge you to go  
22 back and look at that again because I don't think  
23 that's appropriate.

24 As to the time frame, I don't think 20,000  
25 years is right as I said earlier. I think we should

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1 have some perspective here so I refer you to a slide  
2 prepared by one Dr. David Esh for the DU meetings.  
3 You can't see it back there but the last thing on here  
4 is 10,000 years out. So that's one perspective that  
5 we have is that we haven't certainly established any  
6 basis for a scientific analysis that goes out further  
7 than that, at least I haven't seen it. I find it  
8 interesting that here again you've called this the  
9 regulatory precedent option that's not like any  
10 precedent I'm aware of. In fact, it's probably more  
11 like the number four in my view. But I also think  
12 that in your report you have the phrase "Just because  
13 a calculation can be performed or computer model  
14 parameters can be set to estimate results for longer  
15 periods of time does not necessarily mean that the  
16 results of the calculations have meaning." That's in  
17 your option 2 but I think it applies to 20,000 years.

18 I think it applies earlier in time. I think you  
19 would see the same thing if you looked at what the NAS  
20 said about Yucca Mountain. Specifically posed a  
21 question by Congress about the meaning of scientific  
22 analyses beyond 10,000 years they said we can't do it.

23 It can't be done. So there is lots of precedents  
24 hanging around 10,000 years. John talked about that.

25

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1 I won't go to it anymore other than to  
2 make a couple of points that I don't really think  
3 you've established a technical basis. I understand  
4 the technical concept, the Ice Age and climate  
5 changes. I don't think you've made a justifiable  
6 correlation between 20,000 years and that approach. I  
7 think it's a big rounded off number. But I think most  
8 importantly what it does is it skews other analyses  
9 and it ties the decision-maker's hands. I briefly  
10 touched on that this morning. But the idea that you  
11 want to analyze what you can effectively and not hide  
12 from the uncertainty or ignore it. I think David,  
13 you're right about human decision-making. We wouldn't  
14 ignore uncertainty, we'd probably be more  
15 conservative. But what we've I think done is when you  
16 take a number that's so far out in time and you crank  
17 out a number and you compare it with a performance  
18 objective, then you're telling the decision-maker what  
19 the answer is. You're not saying here's a range of  
20 unknown and here's a range of what might happen in  
21 that unknown time period that you should consider.  
22 Like the same arguments that revolve around the peak  
23 dose consideration whenever that might occur. I would  
24 suggest should be pulled back in time and that they're  
25 more appropriate in certainly no more than 10,000

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1 years if even that. So I think that also has driven  
2 things like the intruder. I mean, the language about  
3 an intruder must occupy the site. That's new. You  
4 don't say an intruder must occupy it. If you say I  
5 have to justify an intruder barrier for 20,000 years,  
6 analyze the uncertainty of that, then you start - I  
7 think you start driving back to how you're requiring  
8 an intruder to occupy because it becomes impossible  
9 for us to make those calculations with any  
10 reliability. So I think Lisa' right. I think there's  
11 a huge over-conservatism. But those are linked. One  
12 I believe drives the other. You're driven to a more  
13 conservative intruder approach because of what you  
14 can't say that you can eliminate if you're looking out  
15 20,000 years. So here again, you're locking that into  
16 - for a performance objective dose comparison as  
17 opposed to in some sort of realm of decision-making  
18 which a decision-maker would have to consider but  
19 wouldn't be tied into.

20 Finally, you've asked if we don't like  
21 what you've proposed to give you what we do like. So  
22 what I will say to that is I like what DOE is doing.  
23 I think that the basis allows for consideration of  
24 these more extreme time frames and I think that that's  
25 a sound approach. You asked in your comment

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1 solicitation on the update to the concentration  
2 averaging BTP, what we thought about aligning multiple  
3 government organization approaches. I said in my  
4 letter that you might not achieve much by doing that  
5 and it's not necessarily an objective in and of  
6 itself. But in this case, if you think about the  
7 waste stream that we're most concerned with where is  
8 it coming from? It's coming from DOE. They own it  
9 all, all. Even if LES or AREVA or somebody else  
10 builds a new facility and produces it on the private  
11 scale, the USEC Privatization Act still says they can  
12 just give it to DOE. It's DOE's waste. DOE's got a  
13 system that they apply at multiple sites where they  
14 dispose of waste streams like what we're talking about  
15 here more than anybody else ever has. So I think  
16 that's another reason to rely on their model.  
17 Decision-making flexibility, appropriate consideration  
18 of extreme time frames and a prime understanding of  
19 the generator of this waste stream. Thank you.

20 MR. LESLIE: Thank you very much, Tom. Is  
21 there anyone else who wanted to make comments here in  
22 Rockville? When you come up make sure you introduce  
23 yourself, especially since I've forgotten your name.  
24 Actually before you get started, again there's someone  
25 who's rattling paper and rattling their speak on the

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1 line. If you could stop rattling or put yourself on  
2 mute our next speaker would really like that.

3 MR. SHRUM: Thank you. It sounds like  
4 this. My name is Dan Shrum, I'm with Energy  
5 Solutions, and I too would like to thank - I'm very  
6 grateful for the opportunity to speak on this topic  
7 and it's nice to be able to do it in this forum. We  
8 very much appreciate that. I'm going to speak  
9 specifically on the time frame and I'm going to try to  
10 answer the question if not 20,000, what is the number  
11 and why. And I'm going to address that backwards.  
12 I'm going to say why we didn't select 20,000 when we  
13 went through the same process. And that may help to  
14 understand why we don't think 20,000 is the correct  
15 number.

16 We've been participating in this for quite  
17 awhile now and after the SECY paper was written we  
18 knew that we had work to do. We knew that we were  
19 going to have to prepare a new performance assessment  
20 for our client facility. We didn't you know shirk  
21 from that, we knew we had to do something. So we  
22 looked at past guidance, we looked at past things that  
23 had been done by the NRC and we looked at the EIS for  
24 Part 61 and there was a number in there. We looked at  
25 the NUREG documents and there was a number in there.

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1 We attended the discussions on depleted uranium, the  
2 round table discussions, and I disagree with what the  
3 conclusion in the analysis here came up with. We  
4 thought we were kind of zoning in, coming in to a  
5 number of about 10,000 years. It seemed like the  
6 right number. Then as I was reading through the  
7 paper, was looking at your five decisions, you know,  
8 the five decision bullets that's on page 21 and John  
9 has talked about this before. There was these five  
10 decisions and that's where option 3 was decided.  
11 Using those decision criteria option 3 was decided.  
12 But then those options, those tools weren't used in my  
13 opinion when the 20,000 was decided. It went away.  
14 As I read through the paper and got to the final  
15 number it reminded me when I was much, much younger  
16 watching The Empire Strikes Back and we found out that  
17 yes indeed, Darth Vader is Luke's father. That was a  
18 real shock. I wasn't expecting that. You know, in  
19 hindsight it seems kind of funny, everybody makes fun  
20 of it now. Everybody, you know, there's other shows,  
21 that shows up in other movies. But as I read this I'm  
22 like well where did that come from. I don't remember  
23 discussing 20,000 anywhere or seeing that number  
24 before. So then I went through the justification for  
25 the 20,000 and I understand the principle. I don't

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1 know that I agree with how we're going to be able to  
2 get there.

3 We have invested quite a bit of  
4 significant resources in modeling our facility to  
5 10,000 years. As it clearly indicates in the paper  
6 that doesn't mean we can't change the number and crank  
7 it again, that's easy to do. But what does it mean?  
8 We thought it was a stretch with the 10,000,  
9 especially with, you know, we know our site very well,  
10 it's been very well characterized but it's a stretch  
11 to go out 10,000 years. So now we're going to look at  
12 ice ages. And it's not just the 20,000 number that's  
13 an issue, it's based off of ice ages and significant  
14 climate changes. Will we be able to incorporate the  
15 significant socioeconomic impacts of those ice ages as  
16 we do our analysis? Will that be fair? This is not,  
17 we've looked in the past, a reasonable scenario. This  
18 is a game-changer. Life will be different as we know  
19 it. Will we be able to take credit for that? That's  
20 not clear in the paper and I think that'll have to be  
21 fleshed out if we have to stick with the 20,000 time  
22 frame.

23 So I'm a geologist by training. As I look  
24 at these charts I don't see a big difference between  
25 10 and 20 as far as the dose is concerned. I do see a

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1 significant difference in understanding what's  
2 happening at 10,000 and 20,000 years. That's the  
3 issue. We have been going down this pathway and I  
4 trust Larry that Larry's telling us that this is a -  
5 we have a pathway, we're following this pathway.  
6 You're true to your word. We're going to go through  
7 this process. But we thought we were going to be able  
8 to have this discussion when our performance  
9 assessment was completed which is just a few weeks  
10 away, actually two weeks away, in that discussion of  
11 the significant decisions on after 10,000 years  
12 because that's where the - that's where the discussion  
13 is really going to be had, not getting up to that  
14 point. It's what risks are we as a society going to  
15 be willing to accept. We just thought we were going  
16 to have that discussion at 10,000 years as opposed to  
17 20. So I know I beat that into the ground enough but  
18 I just had to get the Darth Vader reference in there.

19 Lisa talked about the intruder assessment  
20 and we must assume that the intruder will have access  
21 to the waste. In the concept 61.7(c)(7) I'll just  
22 read the tail end of it. So the assessment can employ  
23 similar methodology to that used for performance  
24 assessment, but the intruder assessment must assume  
25 that an inadvertent intruder occupies a disposal site

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1 after closure and engages in activities that  
2 unknowingly expose the intruder to radiation from the  
3 waste. Another assumption that we have always made is  
4 gauging a probability of whether or not we will have a  
5 realistic intruder or an inadvertent intruder at our  
6 site. This changes that probability to 1. We now  
7 have to assume that somebody's there. We don't  
8 believe that that's realistic. We don't believe that  
9 that's realistic because as Dave mentioned earlier one  
10 of the primary safety measures is siting a facility.  
11 That has to be taken in consideration. We want  
12 isolation. Isolation means that this probability is  
13 much, much lower as opposed to a probability of 1. So  
14 this - I believe this is what Lisa's talking about,  
15 this is what we're referring to. Right now it looks  
16 like we have to assume, we have to assume somebody's  
17 coming in contact with the waste. But it's at year  
18 100 and one day. And that's kind of - that's  
19 different than the way we've approached it in the  
20 past. Anyway, again thanks for the opportunity to  
21 discuss this important topic and that's all I have.

22 MR. LESLIE: Thank you very much. Anyone  
23 else here in Rockville who'd like to comment at this  
24 time? Hold on. Bill Dornsife has a question.

25 MR. DORNSIFE: When NRC was developing

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1 this draft regulation, did you give any thought to  
2 well, if we were the regulator this is what we would  
3 require. For example, when you say you know future  
4 climates, does that mean double the rainfall? What  
5 does that mean? I mean, have you put yourself as the  
6 regulator of how you would implement these things?

7 DR. ESH: This is Dave Esh, NRC. We are  
8 developing a guidance document that will contain much  
9 of what we believe would answer that question. In the  
10 specific area of climate change as I said in my  
11 presentation when you're going to dispose of long-  
12 lived waste, and high concentrations and large  
13 quantities of long-lived waste you're going to be  
14 facing additional technical challenges. There's no  
15 way around that. I don't see how we can say a  
16 cornerstone of our whole process is stability and then  
17 we shortchange it just because somebody has lots of  
18 long-lived waste. We need to make criteria that you  
19 can go through the process and try to determine  
20 whether you can meet those criteria or not and I agree  
21 completely and I tried to emphasize in my presentation  
22 I think the correct way to use the various assessments  
23 is to identify when you may need to set limitations  
24 for your specific site. DOE does this all the time  
25 for their facilities, that's the way they operate,

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1 it's this waste acceptance criteria idea. I think  
2 there's a lot of merit to that if you're doing good  
3 technical analysis to support those limits that you  
4 develop. So that's kind of my answer to your  
5 question. We are developing a guidance document that  
6 expressed what we think should be part of the  
7 analyses, whether it's climate change or other long-  
8 term considerations or intruder assessment.

9 We - I think this idea about the intruder  
10 assessment language that I'll have to look at it  
11 closely to see if I agree with your - the  
12 interpretations we've heard here. But our expectation  
13 is not that you have to assume somebody's building a  
14 house and they're digging into the waste. The  
15 language that says you occupy the site means that it  
16 is - does not appear to be credible to argue over very  
17 long time periods that nobody accesses the site. That  
18 doesn't mean they build a house. They may hike on it  
19 or ride ATVs or whatever the local practices are. But  
20 as you go out in longer and longer time frames it  
21 becomes much harder to argue what the local practices  
22 are going to be. In that case you have to do  
23 something that's reasonably conservative. Not  
24 necessarily, you know, the most speculative  
25 hypothetical bounding case you can develop, but

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1 something that's reasonable. In today's practices  
2 people build houses, people put in wells, they take  
3 activity like that. I think it's reasonable at very  
4 long times to apply those sorts of scenarios through  
5 your system and see what the risks may be. You can  
6 bring all sorts of arguments into play as to the  
7 credibility of the scenarios, but we - it is almost  
8 intractable to define what the probability of those  
9 human behavior scenarios are at very long times. And  
10 I think the regulatory construct that we develop is  
11 trying to work with that. But it might not be clear  
12 from - it might not be clear from the language that we  
13 have right now. So we'll take a look at it.

14 MR. LESLIE: Hold on, Bill. Yes. Tom and  
15 Lisa. Is it a question or a comment?

16 MS. EDWARDS: It's a question.

17 MR. LESLIE: Okay, go ahead.

18 MS. EDWARDS: In the EIS for Part 61  
19 there's two scenarios clearly outlined that have  
20 residential and agricultural, both scenarios,  
21 intruders, that involve excavation of large amounts of  
22 soil and assumptions associated with the amount of  
23 vegetables that are eaten from the garden and from how  
24 the soil is spread around and where they grow the  
25 food, et cetera. Are you saying that those

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1 assumptions may be disregarded in developing a site-  
2 specific intruder scenario?

3 DR. ESH: I think what I'm saying is that  
4 our guidance in say decommissioning and in NUREG-1854  
5 that we apply to waste determinations has been - it's  
6 been developed more recently than say the EIS for Part  
7 61. In those guidance documents we talk about over,  
8 you know, short to intermediate time frames there's  
9 some validity to considering local land practices and  
10 scenarios in developing your assessment. When you get  
11 to very long time frames that could potentially apply  
12 for large quantities of concentrated waste it becomes  
13 much more difficult to argue that you know what the  
14 scenarios may be. So for long-lived waste you may use  
15 some sort of scenario like that. For typical waste I  
16 think there's a lot of validity, you know, if you have  
17 cobalt-60 or other short-lived materials, there's a  
18 lot of validity to arguing for alternate land uses and  
19 what they may be and what the risks may be. But  
20 that's - it'll be in our guidance, we have a whole  
21 section on intruder analysis including defining the  
22 overall scenario. Chris Grossman, raise your hand  
23 there. He's a couple seats away from you. He's the  
24 author of that section and I think it provides a lot  
25 of detail, so.

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1 MR. LESLIE: Dave, thanks. Before we get  
2 to you, Tom, there's actually one kind of clarifying  
3 question that I have for the staff committee. Priya,  
4 when you made your presentation you talked about kind  
5 of the timeline for the proposed rule in the guidance.  
6 Are those planned to be provided at the same time to  
7 the public? Again, speak into the.

8 MS. YADAV: Yes, they will be - they'll be  
9 issued approximately the same time. They'll be issued  
10 under separate Federal Register notices and have  
11 separate comment periods, but it'll be around the same  
12 time. They have to get approved by the Commission  
13 before we can issue them.

14 MR. LESLIE: Sure. Okay. I just wanted  
15 to make sure that what Dave is talking about is what's  
16 being developed now. That will go out, as Priya said,  
17 close to the time of the proposed rule. Go ahead,  
18 Tom. You had a clarifying question or?

19 MR. MAGETTE: This is Tom Magette with  
20 Energy Solutions. A couple of comments. What you  
21 just said in response to Lisa, David, and also your  
22 comment just before that, I agree with that, that's  
23 kind of really my point is that I'm not sure that what  
24 you're attempting to accomplish isn't that  
25 sufficiently accurately reflected in the words, in the

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1 draft proposed rulemaking language. That was my first  
2 comment. What I hear you say you're after is not what  
3 I interpret as what I read and so that's one comment.

4 And of course the related thought is there were some  
5 comments this morning about guidance that may come  
6 out. You have to be real careful where you draw that  
7 line. I'm not looking to get a new rule but some  
8 clarifying words in guidance might not be adequately  
9 helpful.

10 And my second comment goes to this notion  
11 of the period of performance because I also agree with  
12 what you were saying. As you go further out in time  
13 it becomes very difficult to make projections about  
14 the site. Maybe Utah will look like Hawaii in 20,000  
15 years. I'll be surprised but I - basically from  
16 everything I can read from everybody that's ever  
17 written on the topic, including the NAS study for a  
18 geologic disposal, they said we can't say. Even for  
19 geologic disposal. We have no confidence in any sort  
20 of analytical prediction. None. Can't be done. But  
21 because of the uncertainty, because something could  
22 happen we should have some idea of what that means.  
23 It goes to the comment we're making. But that's why I  
24 say that should not be in a compliance context. It's  
25 not looking at what might happen, it's not making a

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1 very conservative assumption saying okay, let's just  
2 assume the worst. What happens if it's the worst.  
3 And because the - what happens if it is the worst?  
4 What if it's Lisa's 2rem number and the decision-maker  
5 says that's the worst? That's not so bad. In some  
6 sort of context in a - outside of a compliance time  
7 zone that could be a perfectly acceptable outcome.  
8 Not in the compliance time zone. That's what I mean  
9 by having the decision-maker's hands tied. So I  
10 agree, as you push out in time you strip away that  
11 latitude. When you put it in the compliance box I  
12 think you create a problem that's not sound  
13 regulation, those regulations.

14 DR. ESH: Just to clarify, are you saying  
15 the NAS Study is the one that you're referencing?

16 MR. MAGETTE: One of the ones I've  
17 referenced is the NAS technical basis for Yucca  
18 Mountain. I think that's been -

19 DR. ESH: Because my interpretation of  
20 that is they said there's no basis to stop the  
21 calculation at 10,000 years, that in fact you should  
22 go to the period of geologic stability which they  
23 interpreted as basically being a million years. And  
24 that's why EPA's standard and NRC's standards for Part  
25 63 go to a million years.

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1 MR. MAGETTE: They go in two tiers.

2 DR. ESH: In two tiers but it's both the  
3 compliance period. There's no distinguishing that  
4 there's something different in the 10,000 to a million  
5 year time frame than there is in the year zero to year  
6 10,000 time frame.

7 MR. LESLIE: Okay. Bill's been patient so  
8 George, can you give Bill Dornsife? And then I'll get  
9 to John Greeves.

10 MR. DORNSIFE: Just a quick comment on the  
11 concept that I mentioned and you're talking about  
12 using looking further out to establish inventory  
13 limits. I think you want to make it clear in the  
14 guidance that you don't want to get into the kind of  
15 trap that we're in in Texas where not only have you  
16 gone way out where things get very uncertain you know  
17 in terms of society, but now you're using the same  
18 dose limit and you're using the worst case you know  
19 data from a sensitivity study to come up with that  
20 inventory. I mean, that's just not reasonable. I  
21 mean, there has to be some consideration given to  
22 considering you know that when you go out beyond  
23 20,000 years or whatever the time frame you choose  
24 that you can't make those conservative assumptions  
25 anymore.

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1 MR. LESLIE: Thanks, Bill. John?

2 MR. GREEVES: On the same thread, I'll  
3 just comment on. Chris, you're writing that section,  
4 that's good. The comment is this isn't the first time  
5 people have discussed this dilemma of how to treat  
6 scenarios way out in time. The two examples that we  
7 do have that I urge you consider are Yucca Mountain  
8 and the WIPP program. And in Yucca Mountain's case  
9 they have a fairly specific scenario defined for that  
10 site-specific location. They I think had wisdom in  
11 not having unbridled speculation about the way things  
12 could look. They specified a certain scenario process  
13 there. So I call that a stylized scenario. Different  
14 unit there.

15 I think WIPP did the same thing. I'm less  
16 familiar with it, but I think WIPP didn't say hey,  
17 we're going to look at all these tremendous amount of  
18 scenarios after 10,000 years. We're going to at least  
19 look at one which is an intruder that will allow a  
20 water well to go through and create some leakage. So  
21 as you go through the rulemaking and the guidance that  
22 Chris is working on, I think those are two metrics  
23 you're going to have to justify departing from the  
24 stylized approach. Other than that you just make the  
25 life of an applicant and even a regulator very

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1 difficult to implement unless you go that way. Just  
2 it's an observation.

3 MR. LESLIE: Thanks for your observation.

4 MR. GREEVES: Well, if you've got a  
5 response that would be good too.

6 MR. LESLIE: Well, for - I want to -  
7 people are warm and I want to give a chance to people  
8 on the phone. And we'll come back for any follow-up  
9 questions and more comments here in Rockville. So is  
10 there anyone on the phone right now that has comments  
11 on the period of performance? If you could identify  
12 yourself. Is the bridge line still alive?

13 MR. KLEBE: Yes, this is Michael Klebe  
14 from the state of Illinois. I have a couple of  
15 comments, couple of questions, and I apologize if they  
16 have been - or if they are duplicative of some of the  
17 ones that other people have made because this  
18 afternoon it was still a little bit hard to hear some  
19 of the - your commenters.

20 I think one of the first questions I'd  
21 like to ask is from a regulatory perspective has the  
22 NRC ever prescribed a standard in a rule but then  
23 issued guidance that allows a lower standard? And  
24 this goes back to the discussion I think during Dr.  
25 Esh's presentation where in using the 20,000-year

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1 period of performance that for sites that don't have  
2 the high quantities or concentrations of uranium or  
3 depleted uranium that they could then have a shorter  
4 period of performance. So my question is has the NRC  
5 ever issued a regulatory standard and then turned  
6 around and issued guidance that allowed a lower  
7 standard.

8 MR. LESLIE: Okay, this is Brett Leslie  
9 and we'll have Chris McKenney address your question.

10 MR. MCKENNEY: This is Chris McKenney,  
11 NRC. Actually in the decommissioning rule that's  
12 exactly what occurs. In the decommissioning rule the  
13 dose limit is a peak up to 20,000 - up to 10,000 -  
14 sorry, revert back. Peak up to 1,000 years. But  
15 while specifically for like building surfaces the  
16 guidance is for a 70-year life for the building and to  
17 look at building surfaces. We don't look at an  
18 analysis over the entire thousand years for activities  
19 left on building surfaces. And in fact, that we focus  
20 the analysis, even though it's a 1,000-year analysis,  
21 we focus for quite a few radionuclides on just the  
22 first few years like ground contamination of cesium,  
23 cobalt-60, things that will decay relatively quickly  
24 over the first few decades rather than needing to  
25 perform the analysis or focus on the later time

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1 periods. So that is not really a new concept from  
2 what is already consistent in the regulations since  
3 1997. And the rules - the regulations and guidance  
4 together and since 1997.

5 MR. LESLIE: Thank you, Chris. I hope  
6 that answered the person's.

7 MR. KLEBE: From my perspective it seems  
8 more appropriate to - a shorter period of performance  
9 - and I'll get into why here in a minute - and then  
10 have some guidance that says if you have certain waste  
11 streams or certain waste characteristics that you then  
12 need to go out for a longer period of performance.  
13 There are a slug of existing low-level radioactive  
14 waste disposal facilities and most of them I'm not  
15 aware have accepted large quantities of higher  
16 concentrations of uranium or depleted uranium up until  
17 now. I mean, if you take a look at the closed sites  
18 of West Valley, you know, Beatty, Nevada, Maxey Flats,  
19 Kentucky, Sheffield, Illinois, to my knowledge they  
20 haven't received large quantities of uranium. And in  
21 the operating sites of Barnwell and Richland I'm not  
22 aware that they're receiving it either. So to me it  
23 seems like historically and based upon your waste  
24 characteristics chart that, you know, for most  
25 commercial low-level radioactive waste the period of

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1 concern really ends at about a thousand years and that  
2 your regulation ought to be written towards that with  
3 some statement that if you are accepting waste that  
4 have you know substantial ingrowth of daughter  
5 products and will increase in radioactivity over long  
6 periods of time that then your period of performance  
7 needs to go out farther.

8           The whole idea of a secondary period that  
9 has no dose limit, you know, while I can find that may  
10 have some value I'm immediately questioning what's the  
11 point. If you don't have a regulatory standard that  
12 it has to meet past that period of performance how are  
13 you decision-makers going to put that into  
14 perspective? How is the public going to respond to  
15 it? The public is going to say well okay, you're  
16 going to take this out to 20,000 years and then oh, by  
17 the way, for the next you know gazillion millennia  
18 there is no regulatory limit. I think that's hard to  
19 justify.

20           And then with respect of the period of  
21 compliance for 20,000 years to start to catch climate  
22 extremes as in glaciation which is what your  
23 discussion in the document Technical Analysis  
24 Supporting Definition of Period of Performance for  
25 Low-Level Waste Disposal, beginning on page 25 and

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1 continuing on for a couple of pages that's what it  
2 appears the 20,000 years is meant to capture. Then  
3 you know, for normal low-level radioactive waste the -  
4 the potential for glaciation at a low-level  
5 radioactive waste disposal facility pales by  
6 comparison with the glaciation of thousands of square  
7 miles of civilization. You know, if you were to have  
8 a mid-continent, northern mid-continent disposal  
9 facility subject to glaciation well there are, you  
10 know, lots of areas of municipal development, i.e.,  
11 Chicago, Milwaukee, all those other you know  
12 communities that would you know seem to me to have  
13 more of a long-lasting or a more greater health impact  
14 than waste that has already been decayed away. And it  
15 seems to me that if the intent is to physically  
16 preserve an intact waste disposal facility in the  
17 northern mid-continent region to survive glaciation  
18 then that seems to me that you're going to force  
19 disposal in that region to be a geologic type  
20 disposal, something that's not going to be subject to  
21 glaciation.

22 MR. LESLIE: Okay. Kind of a housekeeping  
23 point and I hope that was the end of your comment or  
24 do you have more?

25 MR. KLEBE: I guess it would sort of

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1 depend upon if you had any response. Most of the  
2 people there know I can go on forever.

3 MR. LESLIE: Oh, okay.

4 MR. KLEBE: - but I can come close.

5 MR. LESLIE: Okay. Twenty thousand years'  
6 worth? No, just kidding. Kind of a point of  
7 housekeeping. Right now we're coming up to 2:30. We  
8 can run this two ways. What's happened here in  
9 Rockville is it's a sauna. People's ties, jackets,  
10 brows are - and faces are quite red and wet, and they  
11 just turned down the heat. So I think the people here  
12 probably want to take a 10-minute break and we'll  
13 reconvene. Pardon? Okay. Okay. We have one comment  
14 from our Office of General Counsel here and then we're  
15 going to go on a 10-minute break. We'll come back,  
16 continue with the people on the bridge and then we'll  
17 make sure that everyone's comments have been provided  
18 for the people on the bridge. And if they're  
19 clarifying questions that the staff need to respond to  
20 then we'll do that. But again, kind of a reminder,  
21 the staff today are primarily in the listening phase  
22 and what they're trying to do is only provide answers  
23 to clarifying questions, where there's something  
24 unclear in what was presented. So again, rather than  
25 - it's not a round table, it's not a discussion,

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1 they're in a listening mode. So Lisa?

2 MS. LONDON: Yes, I just wanted to answer  
3 one quick question that came up. I forget the  
4 gentleman's name had asked something to the effect of  
5 can something set out in guidance actually supersede  
6 that which is in a regulation and the answer to that  
7 is quite simply no. No, it cannot. And I would like  
8 to reinforce what Brett just said which is that we are  
9 in a listening mode, we can provide you facts that are  
10 already publicly available and that's the extent of  
11 what we're doing today. We are in a listening mode.  
12 Thank you.

13 DR. ESH: I think that was Mike from  
14 Illinois, is the last speaker that said that, Lisa.  
15 And what I was going to reply was I wasn't implying or  
16 meant to imply in my presentation or in the discussion  
17 on that topic that you could do a shorter compliance  
18 period. The compliance period is what it is in the  
19 regulation when the regulation is finalized. For a  
20 site that has say short-lived waste or low  
21 concentrations of long-lived waste you can do a more  
22 simplified analyses that turns the crank out to 20,000  
23 to justify that your risks have been appropriately  
24 managed. But it doesn't change the number that's in  
25 the regulation. So it allows you - it's basically a

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1 level of detail question and in risk-informed  
2 performance-based regulation that's exactly how it  
3 works. You should have high level of detail and  
4 comprehensive information when the risks are high.  
5 You can have simplified information and lower level of  
6 detail when the risks are low. So that was the  
7 concept. Mike, I hope that answered your question.

8 MR. LESLIE: Okay, Dave, thanks for that  
9 clarification. We're going to go ahead and take a 10-  
10 minute break.

11 (Whereupon, the above-entitled matter went  
12 off the record at 2:33 p.m. and resumed at 2:46 p.m.)

13 MR. LESLIE: Okay. I think we have most  
14 of the people who were interested and active  
15 participants. And for those of you who were late, I  
16 made a joke about 10- and 20,000, and 10 and 20  
17 minutes, but it didn't get much laugh. It fell flat.

18 So this is, again, Brett Leslie. I am the  
19 Facilitator for this meeting, and with George Smith.

20 What I want to lay out is kind of what  
21 else we still need to do. I'm going to start with the  
22 people on the phone to see if they have more comments,  
23 and then we will -- when we are done with the people  
24 on the phone, we will come back here. If there are no  
25 more comments, I think Larry has some kind of wrap-up

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1 comments that he will want to present, and then we  
2 will be done with the meeting.

3 So I'll turn to people on the phone. Is  
4 there anyone else who has a clarifying question for  
5 the staff? And if it's a clarifying question, you  
6 know, on something they have presented, they will be  
7 able to provide an answer. But they are not going to  
8 be defending what they've done.

9 Again, kind of a reminder of Larry's good  
10 comments was if not 20,000, what and why? And so  
11 anyone on the phone have comments?

12 MS. JENKINS: Yes. This is Susan Jenkins  
13 with the State of South Carolina.

14 MR. LESLIE: Go ahead, Susan.

15 MS. JENKINS: I have a question about the  
16 -- basically, the purpose and scope of Part 61 and how  
17 it may apply to these new proposed -- or if they end  
18 up being proposed revisions to that part. In 1982,  
19 when Part 61 was first promulgated, we adopted that of  
20 course in South Carolina. That was in 1986.

21 And there is a statement in that first  
22 paragraph that says, "Applicability of the  
23 requirements in this part for waste disposal  
24 facilities in effect on the effective date of this  
25 rule will be determined on a case-by-case basis, and

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1 implemented through terms and conditions of the  
2 license or by orders issued by" -- I guess it would be  
3 the Commission or, you know, the Agreement State.

4 So the question is regarding this overall  
5 purpose and scope of Part 61, and how would you see  
6 that applying to an existing facility?

7 MR. LESLIE: This is Brett Leslie. We're  
8 going to get someone to try to address that from the  
9 NRC staff. Please identify yourself, too.

10 MR. CAMPBELL: This is Tison Campbell with  
11 the Office of the General Counsel. I don't think we  
12 can give you a general answer to your question. I  
13 think, as you noted, it would depend on the facility  
14 and the Agreement State and how they decided to  
15 implement Part 61. So that's something you, as an  
16 Agreement State, would have to look at when you go to  
17 adopt these regulations after they are adopted by the  
18 NRC.

19 MR. LESLIE: Susan, I don't know if  
20 that --

21 MS. JENKINS: Okay. Well, I guess the  
22 question is, would that first paragraph be revised --

23 MR. CAMPBELL: I don't believe the staff  
24 is --

25 MS. JENKINS: -- to remove that sentence?

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1 MR. CAMPBELL: -- planning to propose  
2 revisions to that paragraph at this time.

3 MS. JENKINS: Okay. Thank you.

4 MR. LESLIE: Thank you, Tison.

5 Anyone else on the line have --

6 MR. SEITZ: Roger Seitz.

7 MR. LESLIE: Go ahead, Roger.

8 MR. SEITZ: Oh, I was just checking in. I  
9 just dialed in.

10 MR. LESLIE: Oh, okay.

11 (Laughter.)

12 That's good. You're on the record now.

13 Anyone else have a comment on the bridge  
14 line?

15 (No response.)

16 Okay. I'll check one more time before we  
17 wrap up the meeting. I'll give people a second or  
18 third chance here. Anyone else in the building here  
19 in Rockville have a comment that hasn't been addressed  
20 yet or -- John? You'll need to hold it close to your  
21 mouth.

22 MR. GREEVES: I don't know whether you've  
23 been taking parking lot items or not. It's blank  
24 right now. But I would say there is a parking lot  
25 item of -- what is the compatibility criteria? I'd

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1 like to ask that you share that with us before our  
2 comments are given, so that it would help reflect the  
3 feedback to you.

4 And then, second, it is really a caution.

5 You talked about the guidance being done in the same  
6 timeframe as the rule. And this whole question, which  
7 we spent a lot of time on this afternoon, about 20,000  
8 years, I don't know how you are going to develop the  
9 guidance without knowing the answer of what the  
10 performance period is.

11 So I don't know of a way to do that, but  
12 if you think of it let us know what it is. Once you  
13 write that into guidance, it becomes fixed, so --  
14 anyhow, just a caution about how to handle the 20,000  
15 ECM guidance phase, when it really doesn't get set  
16 right.

17 MR. LESLIE: Thanks, John. Andy?

18 MR. CARRERA: Hi. This is Andy Carrera,  
19 NRC. This topic of compatibility categorization has  
20 come up a couple of times, and I just want to  
21 reiterate that it is in a preliminary state. The  
22 working group has predetermined -- preliminarily  
23 determined the compatibility categorization.

24 However, it has not been vetted through  
25 the Agreement State. There is a process for that. It

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1 has not been vetted through the standing committee on  
2 compatibility, which members of the -- at NRC, we  
3 would look through what we have proposed and provide  
4 feedback on whether we are close or not.

5 So it has not gone through that.  
6 Therefore, we cannot provide it to anyone else yet at  
7 this time.

8 MR. LESLIE: Thank you. Priya?

9 MS. YADAV: Just to add one more thing to  
10 that, to what Andy mentioned. We have an Agreement  
11 State representative on our working group, and we meet  
12 every week and we have talked about the compatibility  
13 categories for several weeks now. And so we had been  
14 getting the Agreement State perspective, and that  
15 actually fed into this -- what the Part B that I guess  
16 John and Tom brought up.

17 Part of the reason why we have  
18 preliminarily noted that as Category C is based on  
19 some comments we got from our Agreement State  
20 representative. So hearing your comments today, we  
21 will obviously go through the process and look at the  
22 compatibility categories again. But that is just kind  
23 of some feedback that we have Agreement State input  
24 into our compatibility categories.

25 MR. LESLIE: Okay. Any other final

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1 comments? Oh, we've got another hand. Right behind  
2 you, George.

3 MS. EDWARDS: Okay. I think as a horse it  
4 isn't quite dead yet. I want to go back to those  
5 projections at 10- or 20,000 years. This is what I  
6 would say. When you ask someone to do a dose  
7 projection that far out, you are asking them to  
8 produce a number with such great uncertainty that it  
9 is a meaningless number.

10 If I told you a thousand years from now we  
11 are going to get an inch of rain on a day a thousand  
12 years from now, plus or minus -- well, plus five  
13 inches, minus one inch, but I said, okay, I did my  
14 little calculation, I made these assumptions, it's one  
15 inch plus or minus one inch. It's a meaningless  
16 number. It means I really don't know what the dose  
17 will be.

18 You know a little more than that, because  
19 you have the source term which you can calculate.  
20 What you don't have is any reasonable assumptions you  
21 can supply for a dose pathway. You are asking people  
22 to produce a number that has huge uncertainties and  
23 is, therefore, meaningless. But once that number is  
24 produced, it will be treated as a real number and a  
25 valid number.

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1           And I think that there is danger in that  
2 and it implies a level of knowledge that we do not  
3 have.

4           MR. LESLIE: Thank you, Lisa.

5           All right. I don't see any hands raised  
6 or people standing up or otherwise identifying that  
7 they have comments.

8           I will drum up one last time for the  
9 people on the bridge line. Any last comments from  
10 those on the bridge?

11           (No response.)

12           All right. I think Larry has a few  
13 closing comments, and after he's done I'll close out  
14 the meeting.

15           MR. CAMPER: Thank you, Brett. What I  
16 plan to do is when we get through these things -- many  
17 of you have been to this -- I try to capture, you  
18 know, moments that cause me to stop and think. And  
19 what I'll try to do is identify some things I heard  
20 along the way.

21           But let me reiterate before I do that what  
22 I said this morning. This is indeed an opportunity  
23 for staff to listen, and that's what we're here to do.

24           I indicated that this discussion today might result  
25 in significant changes, and it may. We have a lot to

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1 think about. We've got to go back and review the  
2 transcripts, talk about that, and so forth.

3 So I guess my first point would be is that  
4 we have listened. We have heard everything you have  
5 had to say. We will do a thorough analysis, and so  
6 forth.

7 I think that much of the commentary that I  
8 have heard today really comes back to the challenge,  
9 as I said this morning, associated with this unique  
10 isotope and form called depleted uranium. It is  
11 indeed a challenge. In fact, I think I could make a  
12 fair argument that it is among, if not the most  
13 challenging things that we have to deal with in waste  
14 management at this point in time.

15 I would echo what John Greeves said, a lot  
16 of good comments, a lot of good dialogue. This is  
17 what we wanted. We wanted a lot of input. We wanted  
18 to hopefully along the way just provide clarifications  
19 as things come up. We hope that we've done that, and  
20 throughout we've shown you that we are listening.

21 Let me kind of go through just a few, you  
22 know, things that I have heard repeatedly or kind of  
23 give one pause. And I'll start from the back and go  
24 to the front, because some of them repeat themselves  
25 many times, and that way we don't have to go through

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1 that but once.

2 Clearly, this question of using realistic  
3 scenarios and trying to define assumptions that take  
4 you out to a period of 20,000 years, repeatedly this  
5 was brought up as a huge challenge and a great degree  
6 of concern.

7 There was a comment made by one of the  
8 individuals on the line toward the end. First, there  
9 was this question that was asked about, you know, what  
10 can you do in guidance, or undo in guidance what you  
11 have already done in a rule, and can you do that?  
12 And, of course, Lisa made a great clarification from  
13 the Office of General Counsel. And we have cited some  
14 examples where we have tried in guidance to clarify  
15 certain things.

16 But what I found most interesting about  
17 that particular point in the discussion was basically  
18 the listener suggested that maybe we ought to be using  
19 a reverse approach. We built this thing all around  
20 depleted uranium, and we've defined the 25,000 -- or,  
21 excuse me, the 20,000-year period -- let's not make it  
22 longer.

23 (Laughter.)

24 The 20,000-year period of compliance would  
25 in fact, one could argue, given that 90 percent, if

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1 not 95 percent, of all the radionuclides to be  
2 disposed of are decaying much sooner than that, and a  
3 thousand years gets you there, certainly a couple  
4 thousand years gets you there.

5 Maybe what we really ought to be doing is  
6 building it all around the majority of the  
7 radionuclides to be disposed, and we are going to  
8 consider all radionuclides and not just depleted  
9 uranium, but handle depleted uranium as truly the  
10 outlier that has a specific consideration. And so  
11 doing it in reverse, if you will, for lack of a better  
12 way to put it.

13 There was a point made that along the way  
14 we thought we had an agreement on 10,000 years during  
15 the public meetings. I certainly, from my  
16 perspective, can understand that, because in both  
17 public meetings I cited the language from NUREG-1573  
18 that talked about 10,000 years, and in citing longer-  
19 lived radionuclides in environmental assessment space.

20 So certainly I can understand why one would have  
21 gotten that impression, but, of course, we have  
22 continued to work the issue.

23 There is a fair amount of interest in what  
24 DOE is doing and the notion that there should be  
25 perhaps more harmonization between what it is that DOE

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1 is doing and what it is that we are trying to do in  
2 this particular rulemaking initiative.

3 Some concern was brought up, again, about  
4 the fact that SECY-08-0147, the SRM, and that blending  
5 has been brought to bear on this, and how does that  
6 all now fit into this package, given that blending --  
7 the blended material really has very little, if  
8 anything, to do with the problems associated with  
9 disposal of depleted uranium.

10 Certainly, the idea, again, that DOE and  
11 NRC should confer regarding a period of performance  
12 was put forth.

13 A lot of discussion about this probability  
14 of intrusion being at one, that it occurs at 101  
15 years, and that even under those arguably conservative  
16 and deterministic approaches we are using a worst-case  
17 scenario on top of that. And so a lot of concern was  
18 expressed about that along the way.

19 DOE offered a lot of comments, many of  
20 which had to do more broadly with Part 61 at large and  
21 the look that we are taking at Part 61 at large, well  
22 beyond what we are discussing here today of course.

23 Unintended consequences, that came up  
24 multiple times -- unintended consequences. And at  
25 several times different concerns were particularly

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1 enunciated about unintended consequences, but  
2 certainly there was a great deal of concern about  
3 that.

4 This morning we had a discussion -- Dave  
5 was talking -- Dave Esh was talking about reprocessing  
6 in his presentation and reprocessing came up later in  
7 the discussion. I do want to draw one clarification  
8 on that point. The Commission has not decided yet  
9 whether it is going to do a rulemaking on  
10 reprocessing.

11 The Commission has -- the staff has  
12 undertaken a gap analysis. We are working on  
13 environmental analyses. But if the Commission does  
14 decide to do a rulemaking on reprocessing, clearly its  
15 timeline appears to have moved out into the future as  
16 well. Just a minor clarification on that point.

17 And, again, this notion that, you know,  
18 you are applying this to all waste. And it seemed  
19 kind of interesting -- there has been a school of  
20 thought that says, you know, you should capture all  
21 radionuclides within this rulemaking. But having done  
22 that, while that is a good thing, the notion of 20,000  
23 years, and so forth, may have had an unintended  
24 consequence, which I cited earlier.

25 Compatibility -- what is the level of

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1 compatibility to be assigned? I know of no rulemaking  
2 where the issue of compatibility doesn't become an  
3 issue. Through the Agreement States, I would like to  
4 see a lesser assignment of compatibility because they  
5 prefer to have as much flexibility as possible.

6 In this case, we do have a representative  
7 on the working group from the State of Texas. The  
8 State of Texas has already taken certain actions in  
9 its regulatory process around the timeline for  
10 evaluation, so it is certainly understandable that  
11 Texas would want flexibility.

12 It was pointed out that we do have a  
13 rather rigorous process that we go through, as  
14 compatibility is assigned. Yes, we have, from the  
15 working group, some thoughts at this point about  
16 assignment.

17 We did discuss Level C for this particular  
18 issue, but it's not a done deal yet, although, John,  
19 your point is well made in terms of the public wanting  
20 to understand what would be the level of compatibility  
21 to be assigned. That will be determined by the time  
22 we come up with a proposed rule per our process.

23 There was a fair amount of commentary  
24 about the dose at 500 millirem, and, again, linking it  
25 back to this probability of one. And certain other

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1 regulatory activities were cited that are taking place  
2 with FEMA or EPA that, you know, result in different  
3 numbers. And, therefore, the question of whether 500  
4 millirem is the right number was challenged somewhat.

5 Repeatedly we heard that 20,000 years, of  
6 course, is a new number. Therefore, it is not  
7 consistent with what has transpired previously, and,  
8 therefore, that raises some concerns about  
9 credibility, and why have you opted for this new  
10 number, even though Dr. Esh, in his presentation,  
11 tried to explain why we settled on that number. I  
12 think there is still a fair amount of concern about  
13 the fact that it is a new number, and it is not  
14 consistent with what has been used elsewhere and in  
15 the past.

16 Very early in our discussion, the notion  
17 of disposal at greater than 30 meters was raised as an  
18 issue, and we quickly pointed out that, yes, we agree  
19 that is a problem, to use that as an example.

20 So just notes that I jotted down along the  
21 away, and there are others as well. But those are  
22 ones that came across repeatedly or loudly, with care  
23 and emphasis. So we have a lot of work to do, and I  
24 think that, speaking on behalf of the staff, we  
25 appreciate all of the input. We will go back and

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1 digest thoroughly what we've heard.

2 I want to close by thanking the staff  
3 again for their hard work, Casey for helping us out,  
4 and Antoinette who is outside helping us out. Our  
5 facilitators, of course, you did a great job,  
6 gentlemen. We thank you. And especially all of you  
7 for taking the time and having the interest and  
8 providing some extremely interesting comments.

9 We thank you.

10 MR. LESLIE: Thank you, Larry, for your  
11 closing comments.

12 A few last bits of housekeeping. I  
13 definitely want to echo Larry's comments on people  
14 being able to primarily follow the ground rules and  
15 really respect the participants. I think your  
16 flexibility in not using the hand mic in the afternoon  
17 was only paid back by having the room too hot.

18 (Laughter.)

19 Which gets me to those participants here  
20 in Rockville. If you do have complaints about what  
21 George and I did today, or what Larry did to you  
22 today, you can always fill out the meeting --

23 (Laughter.)

24 -- public feedback form. So I guess with  
25 that, again, thanks everyone for your participation.

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1 It has been great to see you all.

2 And for the people on the bridge, thank  
3 you for your participation as well. It has been quite  
4 enlightening.

5 Thank you. And this meeting is adjourned.  
6 (Whereupon, at 3:06 p.m., the proceedings in the  
7 foregoing matter were adjourned.)

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