

Official Transcript of Proceedings  
NUCLEAR REGULATORY COMMISSION

Title: Public Workshop on Unique Waste Streams  
Depleted Uranium

Docket Number: (n/a)

Location: Bethesda, Maryland

Date: Thursday, September 3, 2009

Work Order No.: NRC-3039

Pages 1-254

**NEAL R. GROSS AND CO., INC.**  
**Court Reporters and Transcribers**  
**1323 Rhode Island Avenue, N.W.**  
**Washington, D.C. 20005**  
**(202) 234-4433**

1 UNITED STATES OF AMERICA

2 NUCLEAR REGULATORY COMMISSION

3 + + + + +

4 PUBLIC WORKSHOP 1 ON UNIQUE WASTE STREAMS -

5 DEPLETED URANIUM

6 + + + + +

7 THURSDAY,

8 SEPTEMBER 3, 2009

9 + + + + +

10 BETHESDA, MARYLAND

11  
12 The public workshop was convened at the  
13 Hyatt Regency Bethesda, One Bethesda Metro Center,  
14 7400 Wisconsin Avenue, at 8:30 a.m., CHIP CAMERON,  
15 Facilitator, presiding.

16 PANELISTS PRESENT:

17 CHIP CAMERON, Facilitator

18 CHRISTINE GELLES, U.S. Department of Energy

19 GREG KOMP, U.S. Army Safety Office

20 RICHARD A. HAYNES, SC Department of Health and  
21 Environmental Control

22 MARK YEAGER, S.C. Department of Health and  
23 Environmental Control

24 ARJUN MAKHIJANI, Institute for Energy and  
25 Environmental Research

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

## 1 PANELISTS PRESENT (Continued):

2 DIANE D'ARRIGO, Nuclear Information and Resource  
3 Service

4 THOMAS E. MAGETTE, Energy Solutions

5 WILLIAM DORNSIFE, Waste Control Specialists

6 FELIX M. KILLAR, Nuclear Energy Institute

7 MICHAEL T. RYAN, NRC Advisory Committee on  
8 Reactor Safeguards

9 STEPHEN WEBB, Sandia National Laboratories

10 PETER C. BURNS, University of Notre Dame

11 GREGORY SUBER, U.S. Nuclear Regulatory  
12 Commission

13 DAVID ESH, U.S. Nuclear Regulatory Commission

14 JAMES KENNEDY, U.S. Nuclear Regulatory  
15 Commission

16 ALSO PRESENT:

17 KAREN PINKSTON, Nuclear Regulatory Commission

18 LARRY CAMPER, U.S. Nuclear Regulatory Commission

19 DAVID ESH, U.S. Nuclear Regulatory Commission

20 MARK FUHRMANN, U.S. Nuclear Regulatory Commission

21 S.Y. CHEN, U.S. Nuclear Regulatory Commission

22 JOHN GREEVES, Talisman International

23 DUNCAN WHITE, U.S. Nuclear Regulatory Commission

24 DAVID JAMES, David James Consulting

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

## TABLE OF CONTENTS

AGENDA ITEM	PAGE
Facilitator Opening Comments	4
C. Cameron, NRC	
Issue 1.5: Modeling of Uranium Geochemistry in a Site-specific Analysis	44
Introduction	44
K. Pinkston, NRC/FSME	
Issue 2: Unique Waste Streams	106
Introduction	106
D. Esh, NRC/FSME	
Issue 3: Agreement State Compatibility	
Introduction	152
D. White, NRC/FSME	
Issue 4: Long-Term Rulemaking: Waste Classification	211
Introduction	
L. Camper, NRC/FSME	
Issue 5: Other Considerations	228
Introduction	
P. Bubar, NRC/FSME	
Adjourn	

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

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

(8:39 a.m.)

FACILITATOR OPENING COMMENTS

FACILITATOR CAMERON: Good morning, everyone. Thank you, Felix. We are waiting to see if we have got some of our other participants before we started off. I think we will wait about one more minute, and then we will get started.

Fifty seconds, Larry.

(Pause.)

FACILITATOR CAMERON: Well, I think we are going to have an interesting day today. I just wanted to start out with some agenda checks for you. And with a great amount of caution, I have tried to summarize some of the points from yesterday's discussion. It doesn't include a lot of things but some sort of the high points and should not be relied on for anything. But I thought it might be useful to do that.

Luckily we have a transcript. Charles has been getting everything. And the NRC staff and all of you will have that transcript to review before the Salt Lake City meeting, which is September 23rd and 24th at the University Court Marriott, Priya?

MS. PINKSTON: University Park.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

(202) 234-4433

1 FACILITATOR CAMERON: Okay. University  
2 Park. If you look at your agenda, 3:15 we have "Other  
3 Considerations." And there are some selected specific  
4 issues that we are going to talk about there. Patty  
5 Bubar, who is Larry Camper's deputy, is going to tee  
6 that up for us.

7 For example, one of the issues I think is  
8 going to be what happens in the interim. There will  
9 be drastic climate change by the time this rule is  
10 finished.

11 (Laughter.)

12 FACILITATOR CAMERON: So what happens in  
13 the interim? That's a joke, Mike. Sorry.

14 (Laughter.)

15 FACILITATOR CAMERON: We will also get to  
16 the parking lot issues at that time. I put them up on  
17 the wall back here. Some of them we have dealt with,  
18 but just a couple of things in summary.

19 There was a suggestion that there should  
20 be some sort of response from the NRC to the issues  
21 today. And I think that Larry and his staff are  
22 probably going to prepare a summary for the Commission  
23 on notable issues from this workshop. And I am not  
24 sure they have decided that that is going to be public  
25 or not. And this is probably news to Priya. You are

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 telling her she is going to be doing that. At any  
2 rate, there will be some type of a response.

3 The issue of doing an environmental impact  
4 statement, rather than just an EA, was brought up.  
5 And, of course, as Larry pointed out, the  
6 environmental assessment has to be done. And that  
7 will be the decision-making tool about whether there  
8 should be an environmental impact statement.

9 One of the other issues is that all  
10 options, rulemaking options, should be on the table.  
11 One person, Arjun, suggested that. And, of course, in  
12 the environmental impact statement or possibly even in  
13 the EA, these types of alternatives would probably be  
14 explored.

15 You will note that Larry is on the agenda  
16 for this afternoon with long-term rulemaking. So we  
17 will probably revisit that issue of what should be in  
18 this particular rulemaking.

19 The issue of alternative state standards  
20 was brought up. We will talk about that in the  
21 compatibility section. And also the idea or the  
22 concept "Is guidance a matter of agreement-state  
23 compatibility?" we will get to that later on this  
24 afternoon.

25 There was an issue raised by Larry's

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 presentation. And I think, Patty, this might be in  
2 the other considerations. This is the sites that are  
3 expecting DU versus sites not expecting DU. At least  
4 that was the way it was framed by Janet Schlueter from  
5 NEI yesterday, the whole idea of how do you consider  
6 waste that has already been disposed of when you are  
7 considering the proposed disposal of waste and other  
8 issues like that. We will be talking about that.

9 Mike Ryan in his opening talked about  
10 site-specific licensing conditions. Mike, if we  
11 haven't explored that to the extent that we should, I  
12 hope that you remind us of that.

13 In terms of a summary, I think one of the  
14 big issues out of the gate was that it seemed like  
15 there was -- I'm very cautious about saying there was  
16 agreement of any type on things here, but there seemed  
17 to be general agreement that there wasn't a need to  
18 define significant quantities of DU, that this would  
19 be taken care of by the site-specific performance  
20 assessment.

21 Several rulemaking process issues were  
22 raised yesterday. There was a suggestion from the NRC  
23 staff. Maybe we can limit the rule to certain  
24 categories of DU, certain sources of DU; for example,  
25 enrichment. And, as Christine pointed out -- and I

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 think there was a lot of agreement that this would  
2 leave some important DOE DU waste out of the picture.

3 Question about direct final rule. Felix  
4 raised that. And I think we have the answer from our  
5 rulemaking folks that that direct final rule is for  
6 rules where you don't expect any comments at all.

7 There was a question about is there enough  
8 data now to assume a rulemaking based on shallow land  
9 burial. And I remember that Larry and Arjun got into  
10 a spirited discussion of that. Later on, subpart C  
11 from part 61, there was an agreement that that could  
12 be on the table in this rulemaking changed to subpart  
13 C.

14 We had a discussion of some type of de  
15 minimis or default level as sort of the opposite from  
16 setting significant quantities. And I think there was  
17 some push-back on that in terms of, well, the  
18 site-specific performance assessment will take care of  
19 that.

20 In terms of guidance on the rule, there  
21 was a call for clear guidance to licensees to let them  
22 know what they had to do in the performance  
23 assessment, but there were also comments about the  
24 need for flexibility and for iteration in the  
25 performance assessment.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

(202) 234-4433

1 A lot of discussion, a period of  
2 performance for addressing DU. People well, well,  
3 look to precedence, look to the 10,000-year model.  
4 Arjun commended us to look at the French experience on  
5 this. There wasn't any agreement on what it should  
6 be, but I think people felt that that period of  
7 performance should be something that is specified in  
8 the rule, rather than left to guidance.

9 And Mike used the metaphor of the dancer  
10 and the dance, Mike Ryan, that the period of  
11 performance -- you have to know what is required to be  
12 demonstrated. That is intricately tied up with period  
13 of performance.

14 And the other concept that was raised is  
15 that you could have a compliance period of  
16 performance, but then there would be some larger  
17 analytical look at period of performance perhaps in  
18 the environmental impact statement in the NEPA  
19 process.

20 Exposure scenarios. That was one area  
21 where everybody thought that this material should be  
22 in the guidance, not in the rule. There was a  
23 discussion of more realism in the scenarios for  
24 exposure scenarios.

25 In terms of source term. we had a lot of

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 talk about engineering and barriers. There was a  
2 suggestion that there might be a minimum standard for  
3 waste form performance that takes into account the  
4 geology of the site, but several people reminded us  
5 that don't make the rule about waste form. And  
6 several people commended us to look at the DOE work on  
7 waste form.

8 I think it was Peter who talked about  
9 durability, and we got into a discussion of a  
10 durability versus stability standard. People said,  
11 "Well, it has to be consistent with part 61."

12 I guess, finally, there was discussion.  
13 Many times we heard about consistency with EPA  
14 standards, radiation standards, chemical standards.  
15 And so that was also something that bubbled up from  
16 time to time.

17 We do have Dan Schultheisz from the EPA  
18 with us today. Welcome, Dan.

19 And, with that, I just would ask, any  
20 questions about agenda? Any comments on the parking  
21 lot or the summary? Bill?

22 MR. DORNSIFE: Yes. I guess I would like  
23 to just revisit quickly the issue of some lower limit  
24 that is okay to continue disposing while deliberations  
25 are being made. Is everybody comfortable that cone

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 the final rule is published and it says, "Thou shalt  
2 do a performance assessment to determine what, if any,  
3 you could take," that any disposal that is occurring  
4 of any DU will come to a screeching halt until, first  
5 of all, the agreement state implements that regulation  
6 and, secondly, the performance assessment is done. I  
7 mean, that was my concern with having some sort of a  
8 level specified somewhere that shouldn't cause any  
9 impact to any currently licensed disposal facility.

10 FACILITATOR CAMERON: So, yes. I remember  
11 that your concern was that if there wasn't a de  
12 minimis standard, if there wasn't a lowest common  
13 denominator -- now, why? Diane walked in right when  
14 we said that? No, no. We are just beginning to have  
15 fun. So you are here on time.

16 The issue on the table is should there be  
17 -- we called it lowest common denominator.

18 MR. DORNSIFE: An okey-dokey level. How  
19 about that?

20 FACILITATOR CAMERON: An okey-dokey?  
21 Okay. We eliminated the word "silly" yesterday, and  
22 today maybe we will get rid of "okey-dokey," but I  
23 think you know what Bill is talking about.

24 His assumption is if there isn't something  
25 like that in the rules that states will say, "We are

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 going to establish a moratorium on disposal until the  
2 agreement states implement the rule," I would ask you  
3 to not only comment on the idea of the okey-dokey low  
4 level that Bill was talking about. But also is that a  
5 good assumption that he is making that if there isn't  
6 something like that, that there will be moratoriums?

7 Felix? And then I'll stop talking.

8 MR. KILLAR: Yes. Actually, I was going  
9 to bring this up yesterday when this topic came up.  
10 We ran into a similar circumstance back when we were  
11 doing the NESHAPS rulemaking. You may recall with EPA  
12 in the quest about that.

13 One of the things that came out of that  
14 was there was a screening model and a screening  
15 software program and that for a facility, they could  
16 put in their experience in the screening model. If  
17 they pass the screening model, they were done. If  
18 they did pass the screening model, then they have to  
19 go through and do additional analysis and what have  
20 you to demonstrate or make some additional provisions  
21 to do something along that line.

22 So it wasn't a de minimis or something  
23 along that line. It was, if you meet this criteria,  
24 you are okay. If you don't meet this criteria, you  
25 are going to have to do something more significant.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1           And I think that is kind of what Bill as  
2 trying to apply, that what we are looking for is a  
3 very gross line of approval that if you are within  
4 this level, fine, business as usual, what have you.  
5 However, if you exceed this level, then you have to do  
6 more work and more justification for why you continue  
7 doing what you are doing or what have you stuff.

8           That way it doesn't stop the process but  
9 at least establishes a threshold for acceptability.

10           FACILITATOR CAMERON: And so it would be a  
11 tiered approach. Bill, is that in line with your  
12 thinking? Is that one way of doing it that would  
13 alleviate your concern?

14           MR. DORNSIFE: Well, yes. I mean, sure,  
15 it would address it, but I think it would be easier  
16 just to establish a number, a concentration that if  
17 you're below this, it's a diffuse source term, just  
18 like we do for diffuse norm, you know. I mean, it  
19 either is or it isn't, and it's okay.

20           FACILITATOR CAMERON: Okay. And just one  
21 other point -- we are going to go to Christine and Tom  
22 -- is that the scenario you are raising was based on  
23 the fact that the agreement states would take time to  
24 implement this.

25           But this standard that you are talking

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 about, that would be something that would be set in  
2 the rule. So it may not be effective because the rule  
3 wouldn't be implemented then. So there would have to  
4 be some other mechanism, I guess, to do that. And I  
5 don't know what that mechanism is.

6 Christine, what do you think on this?

7 MS. GELLES: Thanks, Chip.

8 Actually, I wanted to ask, though, a  
9 clarifying question because, first off, I think  
10 everybody knows the Department of Energy is a  
11 generator of DU waste that requires disposal in the  
12 near term. So I am equally concerned about the  
13 uncertainty about agreement states continuing to  
14 permit disposal of DU between today and the pendency  
15 of this limited rulemaking.

16 I think, Bill, you were addressing  
17 something to be clarified in the limited rulemaking  
18 that would resolve any ambiguity between its effective  
19 date and the long-term rulemaking, which might be five  
20 or six years out. So I just wanted to clarify that.

21 And I am just going to look to Larry and  
22 to Patty. I think it is the Commission's intent. I  
23 mean, I think it is pretty clearly stated that today  
24 DU remains a class A waste and should be managed as a  
25 class A waste up until the time that there is some

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 rulemaking that changes that or requires additional  
2 analysis.

3 So I am struggling with understanding  
4 whether what Bill is asking for really resolves the  
5 near-term ambiguity.

6 MR. DORNSIFE: Well, I mean, for example,  
7 like I said, in Texas, you know, they're not following  
8 the NRC guidance. They would not allow us to dispose  
9 of pure DU because of the concerns that have been  
10 raised. So we came up with a number, a concentration  
11 that below that, it would be acceptable.

12 And I am concerned that that same kind of  
13 philosophy is going to leak out to other places, and  
14 there needs to be some way, particularly after the NRC  
15 rule gets adopted and somebody says, "Well, gee, the  
16 interpretation is you can't dispose of anything until  
17 you do a site-specific analysis," everybody is going  
18 to say, "Hold it," you know, "No more disposal of any  
19 DU."

20 MS. GELLES: Bill, is it possible that  
21 Texas' action was because they issued your draft  
22 order, your draft licensing order, before the NRC had  
23 voted on the paper and had provided direction to the  
24 staff?

25 MR. DORNSIFE: Well, no. This discussion

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 occurred before that.

2 MS. GELLES: Okay.

3 MR. DORNSIFE: The actual negotiation, the  
4 issue regarding DU, occurred before that.

5 FACILITATOR CAMERON: Okay. You are  
6 raising a number of important issues. I just ask  
7 Larry to hold for a time so that we can hear everybody  
8 on this, Tom, Richard, Arjun, and then go to Larry.  
9 And, Larry, if you would come to the table, that is  
10 wonderful. Tom, your thoughts?

11 MR. DORNSIFE: Just another. Remember,  
12 this issue is already political. And if NRC issues a  
13 rule, you know, no disposal until you can do a  
14 site-specific, you know, the politicians may jump up  
15 and say, "That is what happens."

16 FACILITATOR CAMERON: Okay. And just one  
17 point of information, a process point is that one of  
18 the other considerations that Patty was going to tee  
19 up for us this afternoon is this what happens in the  
20 interim.

21 And I know that Larry and his staff have  
22 had conversations with the state regulators about  
23 this. And there may be something that is going to be  
24 done in state space in the interim that may alleviate  
25 this problem.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 I am going to ask Richard, in addition to  
2 what else he is going to say, if he could talk to  
3 that, too. But, Tom, go ahead.

4 MR. MAGETTE: Speaking strictly  
5 technically, I think I would say that I am  
6 okely-dokely with an okey-dokey level. But I agree  
7 with Christine in that I am not sure that that really  
8 will resolve Bill's problem. And I agree completely  
9 with Bill that this is potentially a problem because  
10 it could also still be held in abeyance in some states  
11 of view until they adopt the rule, even if it is  
12 compatibility category B.

13 So just the fact that that number is in  
14 there I don't think solves the problem that Bill  
15 identifies, which is a real problem. So I think it is  
16 going to be incumbent upon the NRC to find a solution  
17 to this problem.

18 It could come in guidance. I think the  
19 states generally are responsive to guidance that if  
20 the NRC says in the statement of considerations, for  
21 example, with the final rule that those specific  
22 actions regarding an ongoing disposal of depleted  
23 uranium is necessary pending the completion of a  
24 performance assessment, then that is about as clear as  
25 you can be. What I think we need is some clear,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 specific guidance from the NRC.

2 I am not sure there is a perfect solution  
3 here because of Bill's last point about the political  
4 nature of this and what people will try to say about  
5 what the NRC said when the NRC finally says something  
6 in the form of a final rule is also true.

7 So I think we are going to be expecting  
8 good faith implementation of the rule and the  
9 guidance. But if someone just wants to be  
10 obstructionist and use the fact that NRC is now saying  
11 that you have to do something more with depleted  
12 uranium as a means for delaying the disposal of  
13 depleted uranium until all is said and done, well,  
14 that could be a long time.

15 I mean, forget the second rulemaking. The  
16 promulgation of guidance to supplement the first  
17 rulemaking will take time. NUREGs don't pop out  
18 overnight.

19 And so I think we need the NRC to speak to  
20 the interim.

21 FACILITATOR CAMERON: Okay. We are joined  
22 on the issue now on what happens in the interim. And,  
23 Tom, that was a great, great summary. And it may be  
24 that since we have had so much discussion already on  
25 this point, that we keep discussing this interim issue

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 and finish it off right now, instead of waiting until  
2 this afternoon. But let's go with the flow and see  
3 what happens.

4 Let's go to Richard and Arjun and then  
5 Larry. Okay. Response, Richard?

6 MR. HAYNES: Okay. First off, I agree  
7 with Christine's approach. That is, it is A waste and  
8 up until the time that any reg changes come out. So  
9 in the interim, it is A waste up until that time. So  
10 I concur with that from South Carolina's standpoint.

11 Once the reg comes out -- and I think this  
12 will go into a lot more detail this afternoon -- is  
13 the state compatibility time frames and after that,  
14 that once you get to the regs being finalized from the  
15 NRC, it is going to take a period of one to three  
16 years depending on the state process for the agreement  
17 states to adopt that regulation depending on how their  
18 system works.

19 In South Carolina, it would take a minimum  
20 of one year. And what you do in the interim, that is  
21 a tough question. I think that is going to have to be  
22 each individual state's mechanism on how they want to  
23 implement that in the interim.

24 And I would state from our standpoint to  
25 realize that each state has the ability to be more

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 restrictive than the federal guidance on that. So in  
2 Texas' case if that is their prerogative to have a  
3 more stringent standard or Utah, so would South  
4 Carolina probably for that matter.

5 FACILITATOR CAMERON: Okay. Thanks.  
6 Thanks, Richard.

7 Arjun? And then we'll go to Larry.  
8 Arjun?

9 MR. MAKHIJANI: Yes. I think it would  
10 defeat the purpose of the rulemaking if depleted  
11 uranium from enrichment plants were allowed to be  
12 disposed of in the interim. The Commission has said  
13 and it is a clear matter of record that depleted  
14 uranium from enrichment plants was not classified in  
15 the earlier rulemaking and is not part of the  
16 low-level waste framework. And that is why we are  
17 having this.

18 So I think I would urge a very specific  
19 exclusion because the record on this point is very,  
20 very clear. If you are going to allow this, then the  
21 question arises, are you going to unbury this waste if  
22 some different decision is made? We already had been  
23 discussing yesterday that a one million-year time  
24 period for shallow land burial doesn't make technical  
25 sense just in terms of performance assessment. At

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 least some people believe that. So I think that  
2 should be off the table as an interim matter.  
3 Otherwise this rulemaking doesn't make any sense.

4 So, as far as other interim things, I  
5 recognize that there is an issue there. I would  
6 suggest that the way the rule was made earlier is very  
7 clear and there are 17 curies of depleted uranium  
8 allowed in any disposal site at a concentration, I  
9 would say, of 50 nanocuries per cc.

10 It is in the draft EIS. The evaluations  
11 were done. I recognize, you know, the reference sites  
12 may not correspond to all the exact sites which would  
13 be disposed of, but at least there is a record there.

14 There is a regulation there. There is an evaluation  
15 there. And there would be at least a reasonable case  
16 for allowing that in the interim.

17 FACILITATOR CAMERON: Okay. And, Arjun,  
18 just to make sure I am clear on that is that you are  
19 taking an opposite approach. You are saying that  
20 until this rule is proposed, data offered, comment,  
21 that there should be no disposal of DU. Is that what  
22 you're saying?

23 MR. MAKHIJANI: No, no. That is not what  
24 I said.

25 FACILITATOR CAMERON: Okay. All right.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. MAKHIJANI: I said small quantities  
2 that were considered in the earlier rulemaking. As  
3 defined in the earlier rulemaking, I think that would  
4 be a reasonable case for allowing that, which is less  
5 than 50 nanocuries per cc and 17 curies per site.

6 FACILITATOR CAMERON: Okay. Go back to  
7 that.

8 MR. MAKHIJANI: Yes.

9 FACILITATOR CAMERON: Okay.

10 MR. MAKHIJANI: But on no account should  
11 depleted uranium, any depleted uranium from enrichment  
12 plants or pure depleted uranium, be allowed to be  
13 disposed of. That just wasn't covered by the earlier  
14 rule.

15 And I can show you by simple RESRAD  
16 calculation that it is not at all clear that 17 curies  
17 of pure depleted uranium would not cause problems in  
18 less than 10,000 years. We have done the calculation.

19 FACILITATOR CAMERON: Okay. So there are  
20 the views, Larry. And thanks for that clarification,  
21 Arjun.

22 MR. DORNSIFE: Just a quick question. I  
23 would assume that you would have no problem if an  
24 agreement state has already approved something in a  
25 license that has gone through a performance assessment

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 and is justifiable that you could use that  
2 concentration, ultimate limit, or whatever.

3 MR. MAKHIJANI: Well, you know, I have not  
4 looked at your most recent licensing documents from  
5 the WCS application. But at the time that we were  
6 intervening in the LES case, the WCS came up, as you  
7 know, as a potential disposal site.

8 At the time, as the record stood then --  
9 maybe you were hired after that. I don't know, Bill.

10 But, as the record stood then, I felt the WCS was  
11 completely unqualified to receive waste, much less  
12 dispose of it, because in the license application,  
13 they proposed to dispose of 12,000 metric tons of 235U  
14 in the waste, which corresponds to more 235U than has  
15 ever been mined.

16 Now, if you don't know how to read the  
17 labels, how can you safely dispose of the waste? I  
18 have the same kind of problem with underlying  
19 technical document at the Clive, Utah site, at the  
20 Energy Solutions site.

21 So I don't have a lot of confidence in  
22 what the states are doing. I don't know if your  
23 technical capabilities at your company improved since  
24 that license application version, but I am not  
25 comfortable with what I have seen of what the states

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 are doing. And I am on the record as saying that the  
2 NRC is not fulfilling its oversight responsibilities.

3 FACILITATOR CAMERON: Okay. This is an  
4 important issue, but it is not directly related to  
5 this particular rulemaking. So you can continue this  
6 offline on this particular subject.

7 Greg, before Larry goes, do you want to  
8 say one more on it since the Army has a lot of --

9 MR. KOMP: Yes. This goes back to  
10 Christine's comment from yesterday. It is very  
11 important we recognize that there is more than one  
12 waste stream here, the more forms of DU that we're  
13 disposing of. So as we go forward with this  
14 amendment, we need to keep that in mind.

15 I agree with what Tom and Bill have said.  
16 We need to have that capability to continue current  
17 disposal until the new option comes in, whether it is  
18 limited by the existing rules that may be a good  
19 solution or it is another proposal within that rule,  
20 but we definitely need to have that capability as we  
21 move forward with this particular rule.

22 FACILITATOR CAMERON: Okay. Thank you.

23 And, Larry, the floor is yours.

24 MR. CAMPER: Thank you.

25 I mean, any one of these things could be

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 talked about for a very long period of time, but let  
2 me try to address at least what I have heard, provide  
3 some clarification in terms of what the staff is  
4 thinking, and perhaps provide some clarification in  
5 terms of the recommendation we made to the Commission  
6 about this topic and what happens in the interim.  
7 Then Patty will talk a lot more about it later in the  
8 day.

9 This question was raised, I think by  
10 Christine, as to whether or not this remains class A  
11 waste. And the answer is yes. The Commission  
12 reiterated during the LES proceedings that for  
13 purposes of the proceedings, it remained class A waste  
14 but then asked the staff outside of the adjudicatory  
15 process to look at whether or not the quantities of  
16 depleted uranium warrant so forth and so on. You  
17 heard that yesterday.

18 Nothing that the staff did in that SECY  
19 and its recommendation to the Commission changed the  
20 class of the waste. It remains class A waste as  
21 currently defined given the default provision.

22 This question of what happens now, if you  
23 look today in 61.12, where it talks about certain  
24 technical criteria that is to be evaluated, and you  
25 look in 61.13, which requires a technical analysis,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 there are those -- and we had the discussion amongst  
2 ourselves as we were developing this particular  
3 recommendation to the Commission -- as to whether or  
4 not there was any need to do anything more because a  
5 technical analysis, different term, not performance  
6 assessment, is already required and, thus, is also the  
7 case in parallel state regulations. The states that  
8 currently operate low-level waste facilities have such  
9 a requirement in the regulations.

10 So one could argue that there is already a  
11 regulatory basis in place that would require a  
12 performance assessment. Let's use the current term we  
13 are using for purposes of discussion.

14 However, in looking at that, during the  
15 course of our recommendation to the Commission -- and  
16 we talked about it. I think it's on page 2 of the  
17 SECY -- we wanted to be absolutely certain that there  
18 was no question about the need for a site-specific  
19 performance assessment given the large quantities of  
20 DU that are now anticipated for disposal that were not  
21 evaluated at the time part 61 was put into place.

22 It is for that reason that that was one of  
23 the drivers that led us to make the recommendation  
24 that we did. We wanted to be absolutely certain that  
25 it was clear that that was the Commission's

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 expectation.

2 Now, also, of course, you have the  
3 performance objectives in subpart C of part 61 that  
4 have to be met. And that has been a requirement ever  
5 since the regulation came into play. So one could  
6 argue that there has already been, there is a  
7 regulatory basis that necessitates an appropriate  
8 evaluation of the site to determine that depleted  
9 uranium or what other material could be disposed there  
10 in a manner that meets the performance objectives of  
11 subpart C and part 61.

12 So this initiative that the Commission is  
13 pursuing now is above and beyond that for that reason.

14 That's why I said yesterday it is an enhanced  
15 regulatory presence over the disposal of depleted  
16 uranium.

17 This question of the role of the  
18 performance assessment, let me address that by quoting  
19 something that the Commission said during the course  
20 of the LES proceedings.

21 The Commission gave considerable weight to  
22 the authority and ability of agreement states during  
23 the LES national enrichment facility hearings in order  
24 CLI-06-15, which came out in June of '06. The  
25 Commission states, "The NRC does not regulate any of

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 the five near-surface waste disposal facilities  
2 identified in the FEIS as potential locations for  
3 disposal of the LES depleted uranium. These potential  
4 disposal sites are either regulated by state  
5 authorities under the NRC's agreement state program or  
6 by DOE. If LES ultimately chooses one of these waste  
7 disposal facilities will fall within the purview of  
8 one of these authorities, not the NRC, to approve and  
9 regulate the disposal, we would expect," my emphasis,  
10 "we would expect the appropriate regulatory authority  
11 to conduct any site-specific evaluations necessary to  
12 confirm the radiological dose limits and standards can  
13 be met at the disposal facility in light of the  
14 quantities of depleted uranium envisioned."

15 It was to certainly some large degree in  
16 the staff's thinking that the Commission had that  
17 expectation that we proceeded with the recommendation  
18 that we did. Expectation should be codified in a  
19 regulatory requirement. And that was certainly a  
20 significant consideration of ours as we made the  
21 recommendation to the staff.

22 So I think if one looks at the regulatory  
23 basis today in part 61, if one looks at the  
24 Commission's expectations, as expressed during the LES  
25 proceedings with regard to the role of the agreement

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 states conducting a site-specific performance  
2 assessment, I think the basis is clear it is there.

3 Now, as far as what is being done in the  
4 interim, I would suggest, as I did during my remarks  
5 yesterday, that the interim is already being dealt  
6 with. We have had discussions with the states in  
7 which these facilities are located. They either have  
8 or are in the process of developing performance  
9 assessments or enhancing performance assessments. All  
10 the states agree with us about the role of the  
11 performance assessment. So we have initiated current  
12 efforts to address the interim situation.

13 I said yesterday in our remarks that we  
14 think it would be prudent to revisit that performance  
15 assessment. We use that term carefully because, on  
16 one hand, as I said, one can argue that you already  
17 had this requirement in part 61, the technical  
18 analysis, but, yet, at the same time, we are taking an  
19 enhanced regulatory step, presuming this rulemaking  
20 becomes a reality. So we are trying to find a balance  
21 in our terminology by suggesting that it would be  
22 prudent that performance assessments be reevaluated,  
23 they be modernized, and they be appropriate for the  
24 material that is expected to be received at these  
25 sites.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1           The staff and the Commission, for that  
2 matter, are fully aware that there is a high  
3 probability that depleted uranium will go to at least  
4 certainly the Clive, Utah site. And, therefore, we  
5 are placing an emphasis upon this particular point in  
6 terms of the role of the performance assessment.

7           So we think that the interim concerns are  
8 being addressed and will continue to work and talk  
9 with the states throughout the course of this  
10 rulemaking. They may very well turn to us and ask for  
11 guidance or assistance as they conduct their  
12 performance assessments or refine their performance  
13 assessments.

14           We are certainly prepared to assist in  
15 that regard. We have a technical assistance process  
16 for agreement states whereby we do that. I don't know  
17 if they will, but they might.

18           So I think that the interim is underway.

19           FACILITATOR CAMERON: Okay. Great, Larry.  
20 Thank you for that, especially that last part.

21           Arjun, I will --

22           MR. MAKHIJANI: I am completely confused.

23           FACILITATOR CAMERON: We will hopefully  
24 un-confuse this. And one way of doing that is we  
25 heard what Larry has said and particularly the last

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 part about the states already doing performance  
2 assessments to look at DU, possibly an offer of any  
3 assistance from the NRC in doing that.

4 I have a question for Bill and Tom,  
5 Christine, Greg. And then I have a question for  
6 Arjun, and you can get your clarification on that.  
7 The question is, the interim approach that Larry  
8 described, does that alleviate the concerns that we  
9 have heard expressed?

10 And for Arjun, does that alleviate any  
11 concerns that you have? And, Arjun, if you need a  
12 clarification on what Larry said, let's get it on now.

13 Okay?

14 MR. MAKHIJANI: I said I got confused  
15 because I am truly confused. Are you saying that if  
16 this performance assessment is completed, that in the  
17 interim, the agreement state licensees would be  
18 allowed to take depleted uranium from enrichment  
19 plants if they think it's okay?

20 MR. CAMPER: A facility authorized to  
21 receive class A waste can take depleted uranium.

22 MR. MAKHIJANI: Well, I just want to be  
23 clear what you are saying.

24 MR. CAMPER: I don't know how to say it  
25 more clear.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 MR. MAKHIJANI: Including from the plant  
2 or not?

3 MR. CAMPER: Depleted uranium remains  
4 class A waste. If you are authorized to receive class  
5 A waste, you may receive depleted uranium.

6 MR. MAKHIJANI: Then what is the purpose  
7 of this rulemaking?

8 MR. CAMPER: The purpose of this  
9 rulemaking is to require, to ensure that a  
10 site-specific performance assessment is done to  
11 evaluate the quantities of depleted uranium  
12 anticipated from enrichment facilities and to provide  
13 the technical criteria that is to be evaluated and to  
14 provide guidance in conducting performance assessments  
15 to evaluate those quantities of material.

16 MR. MAKHIJANI: Well, you have some  
17 obligation to be clear with us. Does that mean that  
18 in the interim, you are going -- the purpose of this  
19 rulemaking is about depleted uranium from enrichment  
20 plants.

21 Is what you mean that in the interim,  
22 disposal of depleted uranium from enrichment plants  
23 will be allowed if a licensee completes their  
24 performance assessment?

25 MR. CAMPER: The agreement states --

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. MAKHIJANI: It's a straightforward  
2 question.

3 MR. CAMPER: I'll try to give you a  
4 straightforward answer. The agreement states that  
5 regulate low-level waste facilities are the ones that  
6 provide the regulatory oversight of those sites in  
7 their states.

8 Let me finish the answer, please. Nothing  
9 in the course of this rulemaking has changed the class  
10 of the waste. If the state has authorized a disposal  
11 facility to receive class A waste, they may receive  
12 class A waste, including depleted uranium.

13 FACILITATOR CAMERON: I think that Arjun  
14 --

15 MR. MAKHIJANI: I can't agree with that.  
16 CLI-19-05 in October 2004 clearly said that a new  
17 rulemaking was required for depleted uranium from  
18 enrichment plants because it was not currently  
19 classified within the existing scheme.

20 So the idea of the depleted uranium from  
21 enrichment plant is class A waste under the existing  
22 schemes is entirely wrong and goes against the  
23 direction that you got in 2004 and under which we are  
24 currently convened here to review that matter.

25 If you are going to allow depleted uranium

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 disposal from enrichment plants in the interim, you  
2 might as well forget this rulemaking and forget  
3 CLI-19-05 from October 2004.

4 FACILITATOR CAMERON: Okay. And that  
5 answers the question I posed to you, Arjun. And I  
6 think that the short answer that you were looking for  
7 from Larry is yes. He's saying yes.

8 MR. MAKHIJANI: He should say so. He  
9 should say yes, we are going to allow depleted uranium  
10 disposal from enrichment plants if that is the intent.

11 If that is not the intent, he should say current  
12 practice is allowed but enrichment plants, not  
13 allowed. We are looking for some clarity here.

14 FACILITATOR CAMERON: Okay. And I  
15 certainly don't want to answer the question for them,  
16 but I think that what I was hearing is still class A  
17 waste. Larry, is there a yes or no answer to Arjun's  
18 question?

19 MR. CAMPER: I have asked the Office of  
20 General Counsel to review the document that Arjun is  
21 referring to. But in the course of the proceeding,  
22 the Commission reiterated for the purpose of the  
23 proceeding that it was class A waste. The Commission  
24 then asked the staff to do a certain type of analysis  
25 and question if these are the quantities.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1           Nothing in the proposed action by the  
2 Commission at this point in time changes the class of  
3 waste. It remains class A waste.

4           FACILITATOR CAMERON: Okay. Going to Tom  
5 and Bill, Larry's description of what is going to  
6 happen in the interim before this rule is not only  
7 final but implemented by the agreement states, does  
8 that take care of your particular concern? Yes?

9           MR. CAMPER: Regarding your question on  
10 what happens in these states, I mean, for example, the  
11 State of Utah Radiation Control Board is currently  
12 considering a moratorium on the disposal of depleted  
13 uranium, large quantities from enrichment facilities.

14          That is up to the State of Utah and its Radiation  
15 Control Board.

16           I do not know what the outcome of that  
17 will be. We are going to be appearing before that  
18 board and answering some questions on the afternoon of  
19 September the 22nd, but that is a matter for the state  
20 and in the state of Utah, its Radiation Control Board  
21 to consider this request for a moratorium.

22           Now, we do not know what their action will  
23 be. If they were to pursue such a moratorium, it does  
24 raise a number of procedural questions to see how that  
25 would be enacted. And it does raise some questions

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 with regards to compatibility and so forth. But we do  
2 not know what that board will decide to do.

3 Each of the states in which these  
4 low-level waste facilities are licensed may choose to  
5 take actions within their jurisdiction with regards to  
6 the receipt of depleted uranium. But that is a state  
7 matter.

8 FACILITATOR CAMERON: And, Larry, the  
9 intent, is it fair to say that the objective of the  
10 rulemaking is to codify a requirement for a  
11 site-specific performance assessment for depleted  
12 uranium and to specify what the parameters of that  
13 performance assessment should be and to offer guidance  
14 for doing the performance assessment?

15 MR. CAMPER: Yes, that's correct.

16 FACILITATOR CAMERON: David?

17 MR. ESH: The other thing I would add --  
18 and we get lost because depleted uranium is the  
19 problem right now -- is this is about unique waste  
20 streams. It is about an issue with the regulation in  
21 that 61.55(a)(6) for unique waste streams, which is a  
22 much bigger set than just depleted uranium  
23 potentially.

24 FACILITATOR CAMERON: Good point, David.

25 MR. ESH: So there are arguments about

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 depleted uranium. I understand those arguments. But  
2 we still have to do this other piece, regardless of  
3 what is decided about depleted uranium.

4 FACILITATOR CAMERON: Thank you. That's a  
5 good segue for in a couple of minutes getting back on  
6 agenda because we do have a discussion of that. Let's  
7 close this discussion with asking for an answer. Does  
8 the approach, interim approach, described by Larry  
9 Camper alleviate the concerns? And we will go to  
10 Felix and Diane.

11 MR. DORNSEIFE: Yes, I believe so. I mean,  
12 I believe it is going to be handled by the agreement  
13 states. Regardless of whether there is a number in  
14 the rule or not, that is how it is going to be  
15 handled.

16 FACILITATOR CAMERON: Okay.

17 MR. DORNSEIFE: But I have a related  
18 question -- I don't know if it is going to be covered  
19 later -- that I would like to throw on the table for  
20 consideration. For those states that may or may not  
21 meet all of the technical requirements for part 61, is  
22 there a need to have that analysis performed for  
23 purposes of this rule?

24 FACILITATOR CAMERON: What you are saying  
25 is, are there some states that perhaps aren't meeting

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 the existing requirements of part 61 or --

2 MR. DORNSIFE: Well, they weren't licensed  
3 under part 61. You know, they were licensed under a  
4 "agreement state equivalent," which in some cases was  
5 established before part 61 even went into effect.

6 FACILITATOR CAMERON: Bill, I am going to  
7 put that --

8 MR. DORNSIFE: There is some discussion  
9 out there. I mean, there is some belief that there  
10 are certain technical requirements in part 61 that if  
11 they had to go through a new evaluation under part 61,  
12 that the site would not be acceptable.

13 Now, my question is, is that as part of  
14 this rulemaking something that either needs to be done  
15 or should be done?

16 FACILITATOR CAMERON: I am going to put  
17 that in the parking lot for when we get to  
18 compatibility because I think it brings up the whole  
19 review of agreement states through IMPEP.

20 Let's go to Diane and Felix. Diane?

21 MS. D'ARRIGO: I wanted to ask if states  
22 really had the authority to exclude unique waste  
23 streams. You know, I know that there are emergency  
24 access provisions that can require facilities to take  
25 waste either from out of compact or -- yes, I guess it

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 would be out of compact. But do states have the  
2 authority to limit what goes into the facilities?

3 FACILITATOR CAMERON: Okay. There's a  
4 question on state authority. Does anybody from the  
5 NRC want to provide an answer to that? Okay.

6 MR. CAMPER: In my own mind, Diane, that  
7 is a very interesting question. That is a question I  
8 have been pondering of late. I am not prepared to  
9 give you an answer at this point in time because I  
10 have to really have a chance to talk to OGC about it.

11 Duncan White will be here this afternoon.  
12 He is going to talk about compatibility. And perhaps  
13 that might be a question we could defer to him. And I  
14 will try to alert him to that question so maybe he can  
15 speak to it more thoroughly.

16 MS. D'ARRIGO: But previously you were  
17 just saying that it is up to the states if they are  
18 going to allow this in or not. And so I want to know  
19 whether they really have that right.

20 MR. CAMPER: These sites are licensed by  
21 the states. So your first emphasis of regulatory  
22 authority is the state. Now, when you start raising  
23 questions about states restricting -- I mean, states  
24 have already in certain cases restricted access in  
25 their sites to certain classes of waste. They have

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 done that.

2 But I guess those kinds of questions  
3 depend upon the circumstances and depend upon what  
4 types of legal challenges might be posed. I think you  
5 are asking a very interesting question and a very  
6 complicated question. I'm sorry I am not prepared to  
7 speak to it right now.

8 FACILITATOR CAMERON: Okay. And you are  
9 going to try to get more information on this. I think  
10 it's going to be discussed again in the compatibility  
11 agenda item, Diane. But certainly the Utah moratorium  
12 goes right to the heart of the question. And this  
13 review that the NRC does of agreement state programs  
14 under what is called IMPEP goes to the heart of the  
15 question, too, in terms of what the state can do. So  
16 we are going to get to that.

17 Felix? And then we will go to Richard.  
18 And then we will go back on agenda.

19 MR. KILLAR: Yes. I just wanted to kind  
20 of bring the conversation back to what I consider a  
21 reality and maybe more along the lines of what Mike  
22 was talking about earlier, Mike Ryan was talking about  
23 earlier.

24 When this rulemaking started, the concern  
25 was large quantities. And we had a big discussion

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 yesterday of the significance. But it is not  
2 significant. It is really large quantities because we  
3 are disposing of small quantities routinely. And we  
4 need to continue that process.

5 We are in the process of decommissioning  
6 sites that were used for the weapons programs over a  
7 number of years, both through the DOE as well as the  
8 commercial sector, that has depleted uranium. If we  
9 end up in an impasse in this and we stop having the  
10 ability to dispose of that, we stop that cleanup of  
11 those decommissioning of those facilities.

12 So in my mind, it is a lot better to have  
13 that stuff in the ground and worry about it a million  
14 years from now than it is to have it sitting there,  
15 continuing to rust, deteriorate, what have you,  
16 because you have no place to dispose of it.

17 So let's go back and start to talk about  
18 reality versus some technical, frivolous arguments and  
19 stuff. So I think that we need to look at what is  
20 going on now and really focus on the big picture about  
21 the reality when we are getting into large quantities.

22 And, as reality, large quantities, that is  
23 not going to happen for a good number of years. DOE  
24 is just in the process of starting up their  
25 de-conversion facilities. The commercial sector is

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 just in the process of building their facilities. And  
2 so we are starting to accumulate some of these  
3 quantities. We have not really begun to dispose of  
4 large quantities.

5 So I think we need to talk about reality  
6 of today versus what is going to be four or five or  
7 six years from now.

8 FACILITATOR CAMERON: Okay. Thank you,  
9 Felix.

10 And we will go back to Diane for a final  
11 comment. Richard, final comment view from the state,  
12 at least the State of South Carolina, on some of these  
13 issues?

14 MR. HAYNES: Well, I wanted to respond to  
15 Diane's. And it's strictly from the State of South  
16 Carolina. I think our position is yes, we can and we  
17 would feel that we have the authority to regulate or  
18 eliminate or allow for disposal any waste stream, not  
19 just unique. If we felt like it wasn't appropriate  
20 for the facility, we could do that.

21 Having said that, that is an appealable  
22 decision. I mean, of course, if the company and/or  
23 the public can appeal that decision, it would play out  
24 in the legal battle at that point. But that is our  
25 position.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MS. D'ARRIGO: So is that authority based  
2 on state authority or the fact that you are in a  
3 compact?

4 MR. HAYNES: I think it is both.

5 MS. D'ARRIGO: Okay.

6 MR. HAYNES: The compact law has authority  
7 over that issue, too. Yes, you are right.

8 FACILITATOR CAMERON: Okay. Thank you.  
9 That takes care of the interim issue. We are going to  
10 revisit --

11 MR. YEAGER: One more comment based on  
12 what Felix said.

13 FACILITATOR CAMERON: Go ahead, Mark.

14 MR. YEAGER: I'm sorry. It is just real  
15 quick. One of the times when Barnwell was going to  
16 close down when it finally closed outside compact  
17 waste, there were regulations proposed for interim  
18 storage. As a matter of fact, there were a lot of  
19 agreement states that went ahead and implemented  
20 interim storage regulations.

21 So as far as the immediate need, I  
22 understand where you are coming from there. There are  
23 projects where waste is accumulating. But it's not  
24 like this waste and these issues haven't been there  
25 for decades. So it might be a situation for you that

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 you might have to go back to some things that have  
2 already been addressed within the regulatory framework  
3 where you are working as far as just interim storage  
4 while you are waiting for resolution of the problem.

5 I know that is not what you want to hear.

6 You want to get it from point A to point B. But  
7 there might be a place in between that you are going  
8 to have to live with until things are resolved.

9 FACILITATOR CAMERON: Okay. Thank you.  
10 Thank you, Mark.

11 We are going to go back on agenda now.  
12 And we have Karen Pinkston with us to tee up the  
13 issues with site-specific geochemistry. Go ahead,  
14 Karen.

15 ISSUE 1.5: MODELING OF URANIUM GEOCHEMISTRY

16 IN A SITE-SPECIFIC ANALYSIS

17 INTRODUCTION

18 MS. PINKSTON: Okay. So I will be  
19 speaking about site-specific geochemistry and some  
20 background on the issue. Uranium and its daughter  
21 radionuclides produced through the decay of uranium  
22 move through the environment at different rates  
23 depending on the geochemical conditions and  
24 concentrations present.

25 In the screening analysis performed by the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 NRC for the disposal of depleted uranium, the  
2 geochemistry was treated as epistemic or  
3 lack-of-knowledge uncertainty to account for different  
4 geochemistry conditions at a range of sites. This  
5 uncertainty could be better constrained in a  
6 site-specific analysis at a particular site, though.

7 The results of the NRC analysis suggest  
8 that the geochemical conditions, such as the moisture  
9 state of the system, the pH, the carbonate  
10 concentration, and the Red-Ox state, may be key for  
11 the safety of near-surface disposal of significant  
12 quantities of depleted uranium.

13 The environmental mobility or the  
14 potential for the radionuclides move through the  
15 environment from the waste is a function of both how  
16 much is released from the waste and how quickly it can  
17 move through the subsurface.

18 The amount of release from the waste  
19 depends on the solubility of the radionuclide, the  
20 amount of leaching, and the Red-Ox chemistry. And  
21 after the radionuclides have been released from the  
22 waste, how fast the uranium and its daughter  
23 radionuclides will move through the environment is  
24 primarily a function of how much the radionuclides are  
25 absorbed onto the soil, although colloids could also

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 affect the uranium transport.

2 So the release and transport of uranium  
3 can be limited by its solubility. If the  
4 concentration of uranium in water exceeds the  
5 solubility limit, it will precipitate out and become  
6 immobile.

7 The solubility of uranium varies strongly  
8 with pH, the oxidation state, or whether it is in an  
9 oxidizing or reducing environment, and the carbonate  
10 concentration. These properties can vary  
11 significantly from site to site but can also vary  
12 significantly within a particular site.

13 So this graph on this slide Dave Esh  
14 referred to yesterday. And what this is depicting is  
15 estimated travel times for uranium to travel a  
16 distance of 100 meters in the subsurface. And travel  
17 times are shown for three different kinds of soil:  
18 sand, loam, and clay.

19 These estimated travel times were  
20 calculated base on the data provided in the Sheppard  
21 and Thibault compendium of KD values that Dave  
22 described yesterday and using the equation and  
23 assumptions shown on the slide.

24 And in this graph, the right and left  
25 edges of these bars, the two edges, correspond to the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 maximum and minimum KD value reported in the  
2 literature. And the bar in the middle there  
3 corresponds to the geometric mean of the literature  
4 values.

5 Obviously the exact travel time is highly  
6 dependent on the assumed groundwater flow rate, which  
7 in this case was one meter per year. But the general  
8 trend shown in the graph will hold true, regardless of  
9 the site-specific groundwater flow rate.

10 As you can see in this graph, the  
11 calculated travel times range from around 100 to  
12 around a million years for sand and loam soils and  
13 from 10,000 to 100 million years for clay.

14 So not only were there differences between  
15 the different kinds of soil with travel times through  
16 clay being much longer because of clay being able to  
17 much better absorb the radionuclides, but also there  
18 were significant differences in expected transport  
19 times, even within soil of the same type.

20 So some of the key considerations related  
21 to the modeling of the geochemistry include the effect  
22 of oxidation reduction potential, pH, and carbon  
23 dioxide or carbonate concentration or release.

24 The modeling of spatial and temporal  
25 differences in geochemistry, the differences between

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 near-field and far-field chemistry, the concentration  
2 of uranium and depleted uranium and in the vicinity of  
3 any depleted uranium that is disposed of in  
4 significant amounts will be much higher immediately in  
5 the vicinity of the waste and DU than further away in  
6 the environment. And this could affect the behavior  
7 of the system. Finally, site-specific differences in  
8 soil properties are important to be considered.

9 So NRC staff is seeking public feedback on  
10 considerations for developing criteria or guidance for  
11 geochemical parameters and site-specific analyses.  
12 And although my slides focused primarily on uranium,  
13 some of the daughter radionuclides of uranium also  
14 have similar phenomena of having behavior that is very  
15 dependent on site-specific conditions present. So any  
16 input on the daughters would also be appreciated.

17 FACILITATOR CAMERON: Okay. Thank you  
18 very much, Karen. And if you could join us at the  
19 table again?

20 Does our trio of experts, anybody have  
21 anything on that? Peter?

22 MR. BURNS: On the site variability slide  
23 you showed, there is an interesting factor there or an  
24 interesting observation that I would have made had it  
25 not been on the slide. And that is that after 100

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 years, assuming a flow rate of one meter per year, the  
2 uranium can move 100 meters. That is one of the  
3 scenarios that is shown there.

4 That is, of course, no surprise because if  
5 it is an oxidizing environment, the uranium will be  
6 dissolved. So it will move just as fast as the  
7 groundwater unless it is being absorbed and it travels  
8 mostly through a sandy soil. It won't be absorbed.

9 I would say the one meter per year is not  
10 a very good number. It leads to kind of a misleading  
11 scenario there on the site variability slide because  
12 we are talking not about placing uranium below the  
13 groundwater table but shallow burial above the  
14 groundwater table. And just go on outside and find a  
15 sandy soil and dump a few buckets of water on it, and  
16 you will see that it infiltrates a heck a lot faster  
17 than one meter per year. It takes about four or five  
18 minutes for it all to vanish into the subsurface.

19 This was experienced at Hanford. BX-100  
20 tank farm, there was an accident in the 1950s where  
21 approximately 3,000 kilograms of depleted uranium was  
22 spilled onto the surface of the ground. It was a case  
23 where the tank overflowed. And this 3,000 kilograms  
24 of depleted uranium vanished into the subsurface  
25 faster than it could be cleaned up, I guess you could

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 say.

2 And there have been a great deal of  
3 studies about that. It moved down to at least 125  
4 feet below the tanks really quickly, in a matter of  
5 some few years, and seems to be largely still there at  
6 about 125 feet, precipitated in a variety of minerals  
7 and so on.

8 The point I would make is the travel  
9 through the vadose zone, the unsaturated zone, is  
10 likely to be much faster than shown there. And once  
11 the uranium has gotten into the groundwater, well, it  
12 is game over, really, because how are you going to  
13 remediate that situation?

14 FACILITATOR CAMERON: Thank you, Peter.

15 David?

16 MR. ESH: Yes. I would add to that. I  
17 understand the comment. It is a good comment. When  
18 you have a release in the vadose zone and it's  
19 saturated, gradient is one, it moves very rapidly.  
20 But in many of our disposal problems that we evaluate,  
21 you are looking at very low infiltration rates and not  
22 saturated conditions, which can give you a significant  
23 travel time through the vadose zone in some cases.

24 Then Karen's slide was mainly to  
25 illustrate transport in an aquifer, a saturated

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 aquifer, a distance of 100 meters. Generally for most  
2 of our problems, when you do that, analyses of  
3 resident receptor, they are at the edge of the  
4 disposal facility boundary. So you have some  
5 transport distance from the release until it gets to  
6 the receptor location.

7 So it is mainly to illustrate the  
8 variability that you can get from different  
9 geochemical conditions. It's not meant to apply to a  
10 specific site or for a specific problem. It is just  
11 to communicate the concept.

12 Your comments are well-taken about the  
13 effects whenever it is saturated and how that can  
14 impact the transport in the vadose zone.

15 FACILITATOR CAMERON: So that the factors  
16 that Peter is raising would be something that would be  
17 considered in doing the site-specific performance  
18 assessment?

19 MR. ESH: The things that Dr. Burns has  
20 raised are things that we normally expect to be  
21 considered in the site-specific analyses that are  
22 done, yes.

23 FACILITATOR CAMERON: Okay. Thank you.

24 Yes? Go ahead, Peter.

25 MR. BURNS: Well, I would add to that that

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 the situation in the vadose zone becomes much more  
2 complicated in terms of modeling if one assumes a  
3 significant climate variability over, say, 10,000  
4 years, where you could no longer anticipate an  
5 unsaturated or very slow flow.

6 I wanted to add, too, that under key  
7 considerations, we have the Red-Ox potential pH, CO2  
8 concentration on release. Those are clearly very  
9 important as are the minerals downstream that the  
10 depleted uranium would interact with.

11 I would add to that list co-contaminants  
12 from the waste. In particular, I am concerned about  
13 organic molecules of a variety of sorts, like oxalate,  
14 acetate, or whatever that can complex uranium and make  
15 it much more soluble than it could be in their  
16 absence. And such complexation could, at least under  
17 some conditions, pretty much eliminate sorption  
18 downstream as a retardation mechanism.

19 FACILITATOR CAMERON: Thank you, Peter.

20 Bill, Bill Dornsife?

21 MR. DORNSIFE: Yes. Just an observation  
22 on this geochemistry issue. Depending upon the site  
23 location and the importance of the pathway, meaning  
24 water pathway versus radon pathway, a more soluble  
25 waste form, for example, in an arid environment, where

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 erosion is the problem, could be advantageous because  
2 you have less uranium there to create the radon source  
3 term.

4 So I am wondering, is the state of the  
5 modeling sufficient to take that into consideration?  
6 You know, you are reducing, potentially reducing, the  
7 source term to reduce a pathway.

8 FACILITATOR CAMERON: To Peter, Karen?  
9 Karen, do you want to address that?

10 MS. PINKSTON: Yes. In the screening  
11 analysis that the NRC did, the source term was allowed  
12 to -- any water that came in could leach the  
13 radionuclides out. Then they weren't available for  
14 transport of radons. So that was a little bit of a  
15 reason that the wet sites had less of a radon issue,  
16 was that the radionuclides had moved downstream  
17 through the subsurface.

18 So you would expect in a very specific  
19 performance assessment that it be modeled, that all of  
20 the phenomena that would affect the release and  
21 transport would be considered. And so you would be  
22 considering sort of a realistic depiction of what is  
23 happening with the source. So if you were leaching  
24 some of the things away, then you wouldn't have to  
25 consider them for radon.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 FACILITATOR CAMERON: And, Peter, on that  
2 issue? Thank you, Karen.

3 MR. BURNS: So it is a strange issue we  
4 are discussing because we are saying if we manage to  
5 wash away or if all of the radionuclides, the depleted  
6 uranium gets washed away in groundwater, well, there  
7 is no radon problem anymore. Well, that seems  
8 obvious.

9 I think from the -- this could be  
10 considered a controversial statement, I suppose, but  
11 radon is a short-term problem for the people who  
12 happen to be there and impacted by radon at that time.

13 Groundwater contamination is an extremely  
14 long-term problem. And once it happens, it is a heck  
15 of a job to clean up. And you can contaminate vast  
16 aquifers potentially of the United States. Say, a  
17 quarter of the country's groundwater could be  
18 contaminated by a site that leaked a great deal. So  
19 to me, radon is important, but groundwater is the  
20 thing that will impact future generations for  
21 centuries or millennia if contamination happens on a  
22 large scale.

23 FACILITATOR CAMERON: And, Bill, do you  
24 want to say anything to that observation?

25 MR. DORNSIFE: I understand what you are

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 saying, but, you know, when we are playing this model  
2 game, that just isn't true. When you consider  
3 erosion, if you have naked DU, you are going to have a  
4 potential huge exposure to future generations at that  
5 site.

6 And I am not suggesting in any way that we  
7 deliberately make the waste more mobile. It's just  
8 are there sufficient modeling capabilities to take  
9 that into consideration?

10 FACILITATOR CAMERON: Peter, do you want  
11 to address that perhaps subtle distinction that Bill  
12 is making on this or maybe it's not subtle? I don't  
13 know.

14 MR. DORNSIFE: I am never subtle.

15 MR. BURNS: Well, erosion occurred  
16 primarily due to water presumably. So if it is a  
17 highly soluble waste form, you know, it eroded as  
18 well.

19 I don't know if that answers your  
20 question, but in an environment where you are going to  
21 erode away all of the overburden that has been placed  
22 on the ways to protect it, I don't think you can  
23 expect the waste to stick around for any time at all  
24 once it has been exposed.

25 FACILITATOR CAMERON: Karen has something

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 to say on that.

2 MS. PINKSTON: I just wanted to clarify  
3 that I wasn't trying to imply that we thought it would  
4 be a good idea for all of the DU to wash away  
5 immediately into the groundwater.

6 So I was just trying to raise the point  
7 that when you do PA modeling, we would want to  
8 accurately capture what is going on with the source,  
9 including both leaching and diffusion of radon, and  
10 that you can get this phenomenon.

11 You know, our sites that were mediumly wet  
12 showed up in our model as being less of an issue for  
13 the reason that if it is very dry, all of the dose  
14 comes through radon and you get a large dose through  
15 radon. If it is completely wet, it all immediately  
16 washes in the groundwater. And you get a large dose  
17 from the groundwater.

18 If your source is filling the dose between  
19 the two pathways, you can get a lower dose for both  
20 people.

21 FACILITATOR CAMERON: I know the  
22 commissioners will be glad to hear that we weren't  
23 suggesting that.

24 MR. ESH: Just so we're clear, we want the  
25 impacts from both radon and groundwater to be

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 acceptable, period. We're talking about extremes  
2 here, different cases, and debating them. But the  
3 bottom line is it has to be safe for all pathways.

4 FACILITATOR CAMERON: And Felix? And then  
5 we will go back to Peter. Felix?

6 MR. KILLAR: I just had a question. You  
7 know, what we are focusing on here is the impact of  
8 the waste coming into direct contact with the  
9 groundwater. When you look at doing your performance  
10 assessments and you look at your modeling and what  
11 have you, I would think somewhere along the line, the  
12 liners that are on these trenches as well as the caps  
13 on these trenches come into play.

14 And so part of the question is the  
15 geochemistry of the liners and the longevity of the  
16 liners and back to the engineered barriers we talked  
17 about a little bit yesterday. Can you talk a little  
18 bit about that as far as what the NRC's expectations  
19 are for the geochemistry on the liners?

20 MR. ESH: Yes. That's a good comment.  
21 What I would say is that we have a couple of issues.  
22 We have short-term engineered controls that you may  
23 put in place, say, in a traditional commercial  
24 low-level waste facility. And what you may try to do  
25 with those sorts of controls and barriers may be a lot

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 different than what you would try to do for a  
2 long-term problem.

3 So in the short term, you can have  
4 probably a much higher degree of confidence to be able  
5 to isolate material hydrologically through the use of  
6 engineered barriers of various types, whether it's  
7 cementitious vaults or covers or whatever.

8 There is a lot of experience on those. We  
9 continue to do research on them. We have a research  
10 group that evaluates things like clay covers,  
11 engineered covers, cementitious materials.

12 When you move to the longer-term problem,  
13 it becomes maybe in some regards more of a materials  
14 science-type problem, like Dr. Burns talked about.  
15 Then you're really fighting Mother Nature when you are  
16 trying to put a resistive barrier in and use it for  
17 the long term.

18 What we find is that Mother Nature doesn't  
19 like it when you mess with her environment. Then she  
20 tries to change those barriers and make them  
21 ineffective.

22 So if you can engineer your waste to be  
23 compatible with your disposal system, that is  
24 certainly the way you want to go for if you are trying  
25 to deal with longer-term issues.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1           But yes, we have some guidance with  
2 respect to engineered barriers that we have done more  
3 recently than our low-level waste regulations for our  
4 incidental waste reviews. In NUREG-1854, there is a  
5 section there on engineered barriers and also in our  
6 decommissioning guidance in NUREG-1757. We have some  
7 guidance on engineered barriers there.

8           Generally we expect people to be able to  
9 support the level of performance that they want to try  
10 to take credit for in their analyses. And they  
11 support that through modeling, experiments,  
12 observation of analogues, all sorts of things.

13           We heard some discussion yesterday about  
14 unvalidated modeling, that sort of thing. Well, in  
15 performance assessment, I don't think anybody here  
16 would say that we validate performance assessment  
17 models in the traditional sense. You are doing a  
18 projection in time, very long projections into the  
19 future. You cannot validate them in the traditional  
20 sense.

21           The language we like to use is you develop  
22 model support for it. And that usually has multiple  
23 lines of support of different types. We have used  
24 that language in our high-level waste program, which  
25 applies for very long times. And we have been using

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 that language in some of our other programs.

2 So that is a kind of a long, long answer  
3 to your pretty short question.

4 FACILITATOR CAMERON: Okay. Thanks, Dave.

5 Michael? And then we'll go to Peter.  
6 Mike?

7 MR. RYAN: Thanks. David, you really  
8 summarized what I as going to ask about, which is that  
9 the other guidance -- you know, you work very hard on  
10 some waste determinations, which are unique and have  
11 long-lived components in them.

12 I think to the extent you can, if you can  
13 exemplify in the guidance for uranium the same kind of  
14 detail and thinking process that folks should go  
15 through, that would be a real asset to the guidance  
16 that goes with the rule because then folks can have  
17 the framework and do I need to think about, for  
18 example, changing the chemical or the physical form of  
19 the waste itself in order to be better suited for a  
20 given environment? That is a possibility you can  
21 always think about.

22 I may go to a different chemical form or  
23 admix it with some other chemicals that help it be a  
24 better immobile species over the long haul. I mean,  
25 the short haul, the site is going to do the work, but

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 then the long haul, uranium is going to be uranium  
2 forever.

3 MR. ESH: That is a difficult balance and  
4 a challenge that you are probably well aware of --

5 MR. RYAN: Absolutely.

6 MR. ESH: -- to provide that information  
7 and still encourage the people to do their innovative  
8 and flexible approaches because we don't have all of  
9 the answers.

10 MR. RYAN: Yes.

11 MR. ESH: We try to provide our level of  
12 knowledge that we have. And we hope that people go  
13 out there, advance the level of knowledge, and still  
14 have the flexibility to come in and use that.

15 MR. RYAN: And, again, I appreciate I am  
16 asking to climb a tall hill here. But to the extent  
17 that you can put guidance in there that gives readers  
18 or users of the guidance in sites as to what  
19 strategies, for example, you think are good or what  
20 particular technical approaches you think makes sense  
21 under various circumstances you might outline, that is  
22 very, very helpful, I think, to practitioners to get  
23 started.

24 So thanks.

25 FACILITATOR CAMERON: Thank you, Mike.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 Peter?

2 MR. BURNS: Most of what I was going to  
3 say I think has been covered in the last two or three  
4 comments. But I was going to say, Karen, that we  
5 never thought that you really wanted the waste all to  
6 wash away.

7 I was a little confused with one of your  
8 comments. I suspect in your models, the reduction in  
9 radon emanation from areas of high water flow rate is  
10 not due to the uranium being dissolved and flowing  
11 away, but, rather, it is due to the radon being  
12 dissolved and flowing away, instead of coming up  
13 through the vadose zone and being emitted that way.  
14 Maybe you can comment on that.

15 I also just want to make a point again  
16 that I have made yesterday that the geochemistry that  
17 one has at a disposal site should be compatible with  
18 minimizing mobility of depleted uranium once it is  
19 released from the waste form and the waste form should  
20 be compatible with that geochemistry.

21 This causes a problem if you have three or  
22 four sites that exist and that is where you are going  
23 to put the waste because I was putting the cart ahead  
24 of the horse, of course.

25 That perhaps can be addressed with

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 engineered barriers and so on, but the logical  
2 approach if one were starting fresh, from scratch, is  
3 to just think a little bit about the waste forms and  
4 think a little bit about the geology and look at  
5 natural analogues and put it somewhere that it is not  
6 going to move in any considerable way.

7 FACILITATOR CAMERON: Okay, Karen.

8 MS. PINKSTON: So the reduction in radon  
9 at sites that are really wet, I think there are two  
10 factors that affect this. And I'm not sure how much  
11 each factor -- like I don't know what percent each  
12 factor is responsible for, but the one factor is  
13 diffusion through saturated porous media is much  
14 slower than when it is arid and the pores are empty  
15 and the radon can move through the empty pores much  
16 more quickly.

17 Then the second factor was the issue we  
18 talked about about if you leach out some of the  
19 uranium and any of the other radionuclides in the  
20 decay chain above radon, would it reduce the amount of  
21 radon that emanates because the parent is no longer  
22 near the surface for the radon to emanate from?

23 I would think that radium is probably the  
24 most soluble of the radionuclides in the decay chain.

25 It might be the one that is leaching the most, but

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 that is my guess.

2 We did include a Henry's law type of thing  
3 in our model. So that the radon was able to partition  
4 through, between the gas and the aqueous phase in wet  
5 sites so more of it would be moved to the aqueous  
6 phase.

7 FACILITATOR CAMERON: Okay. Thank you,  
8 Karen.

9 Arjun?

10 MR. MAKHIJANI: Yes. I just want to  
11 correct the record regarding this validation question.

12 I took my validation comment directly from the SECY  
13 paper. So you say you need validation. And that is  
14 why I brought up the thing. And today you are saying  
15 you don't need that validation in the traditional  
16 sense.

17 I would just read the sentence into the  
18 record here, "Refinement of the model would be  
19 necessary if it was to be used for licensing decisions  
20 and rigorous validation would be needed."

21 MR. ESH: The words are for a  
22 "site-specific licensing decision." It is very clear.

23 MR. MAKHIJANI: That's right. And if you  
24 need validation of the model, then you validate the  
25 model. I understand that the word "validation" can

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 mean different things in different contexts.

2 You are talking about 10,000 years in the  
3 future. Validation procedure will be different than  
4 if you are talking about something that you can go to  
5 a lab and verify and validate in that sense. I  
6 certainly understand that. I am a scientist, too,  
7 like you.

8 MR. ESH: I understand the comment. You  
9 need different levels of confidence in your models  
10 depending on the use of them.

11 MR. MAKHIJANI: Yes. It's just a question  
12 of whether we're shifting terms as we go along. So  
13 you use the term "validation." I use a term out of  
14 your SECY paper. And then today you say, "We are not  
15 going to validate."

16 So if you can just settle the terms? It's  
17 like this class A stuff. It's everything is always  
18 shifting. And this makes it very, very unclear and  
19 very confusing.

20 MR. ESH: I understand. I think the term  
21 was used very clearly in the SECY paper and you first  
22 used it out of context.

23 FACILITATOR CAMERON: Okay.

24 MR. MAKHIJANI: I do not believe I did. I  
25 think I said that your model was not validated because

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 when we called your office, you refused even to send  
2 us the model so we could look at it.

3 It is an informal model that has not been  
4 reviewed from the outside. There has been no rigorous  
5 external so far as I understood from the NRC or my  
6 librarian understood from the NRC. This is a model  
7 that -- well, I won't characterize it further, but I  
8 think it is not a formal approved model, which I think  
9 should have been done before you made a recommendation  
10 to the NRC because the extent of this model -- yes.  
11 Everybody should be allowed to finish. And I will try  
12 to respect that, too.

13 MR. ESH: Yes. I --

14 MR. MAKHIJANI: Excuse me. It has been  
15 expressed here a number of times that a million-year  
16 modeling for shallow land burial doesn't make a whole  
17 lot of sense. And you did that. Now, the whole  
18 context of how this thing was done and how it was sent  
19 up to the NRC and how the NRC actually set us on this  
20 course is a very uncomfortable thing.

21 I try to be respectful of your context.  
22 If you don't think that I was respectful of your  
23 context, we can go back to the record and fight over  
24 it. But I don't think it is sensible to cast stones  
25 across the table like this.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 I used your terms. Today you shifted your  
2 terms and said, "We don't validate models in the  
3 traditional sense." Are you saying that site-specific  
4 models will be validated or will not be validated?

5 MR. ESH: I think I was very clear. When  
6 you are talking in the field of performance  
7 assessment, you are not able to validate in the  
8 traditional sense, period. Any practitioner in  
9 performance assessment knows this.

10 And what I said was in this instance, we  
11 developed a level of confidence in the calculation  
12 that was suitable for the decision. It was  
13 pre-decisional information. It's not a licensing  
14 decision. And all information that's developed to  
15 support the rulemaking will be documented, will be  
16 available for public comment and review.

17 FACILITATOR CAMERON: And, Arjun, we do  
18 have your comment from yesterday.

19 MR. MAKHIJANI: I am still unclear. Are  
20 you going to require -- here you say in the context of  
21 licensing decisions, rigorous validation would be  
22 needed. As I heard you say now in the context of  
23 performance assessment for long times, validation is  
24 not the right term to use.

25 MR. ESH: I clarified it. And the SECY

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 paper is not our licensing documents. In our  
2 licensing documents, it will be clear what we expect  
3 with respect to model confidence.

4 FACILITATOR CAMERON: Okay. I think we  
5 need to stop there and get on with the agenda. I  
6 think it is clear. I think Larry and his staff have  
7 heard what your concerns are about the technical  
8 analysis and the decision.

9 Do you want to say something real brief?

10 MR. CAMPER: I would.

11 FACILITATOR CAMERON: Go ahead.

12 MR. CAMPER: This has come up two days.  
13 And so I just would like to clear Arjun that I  
14 understand my staff did try to return your call to you  
15 three times. They were not responded to.

16 The information that your organization  
17 raised is not subject to FOIA. It is pre-decisional.

18 Therefore, there is no obligation to provide that  
19 information. But, as Dave said, any information that  
20 is in support of this rulemaking will be FOIA-able and  
21 will be public information.

22 MR. MAKHIJANI: We have not --

23 MR. CAMPER: So I am sorry there is  
24 confusion around that. We have tried to communicate  
25 with you as to that particular request.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. MAKHIJANI: We have not filed a  
2 Freedom of Information Act request. We called your  
3 office to see the model. It was refused. And there  
4 the matter rests as of now.

5 MR. CAMPER: And what I am saying now is  
6 we have, the staff has, tried to reach you three times  
7 to convey to you that the information is not required  
8 to be provided. It is not subject to FOIA. It is  
9 pre-decisional information.

10 I am just clarifying that we tried to  
11 communicate that with you. That is all I am saying.

12 MR. MAKHIJANI: I think it is  
13 objectionable that such a huge decision was made for a  
14 million tons of depleted uranium to set us on a  
15 particular course evaluating shallow land burial and  
16 the underlying documentation is not available to the  
17 public.

18 FACILITATOR CAMERON: Okay. There are two  
19 distinct issues here. And I think the issue that  
20 Arjun brought up about the use of the data to support  
21 the decision to go to the Commission, that is one  
22 issue.

23 This whole business about the availability  
24 of GOLDSIM providing a player or more than that, that  
25 is an ongoing discussion. And I think that it would

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 behoove both the NRC and Arjun to sit down offline to  
2 see what access there might be to the player or  
3 whatever, but I don't think that we need to argue that  
4 out here. And it should be done in as collegial a way  
5 as possible within the confines of what the Agency's  
6 requirements are.

7 So, with that, Bill, are you going to  
8 start something?

9 MR. DORNIFE: No. I just have a  
10 question.

11 (Laughter.)

12 MR. DORNIFE: I just have a quick  
13 question to better understand these pathways. In your  
14 analysis, what radionuclide dominated the groundwater  
15 pathway? And I assume the concentration of radium  
16 dominated the radon pathway.

17 MR. ESH: Yes, you are correct about the  
18 radon. It's the radium that drives that, obviously,  
19 but the radium comes from the uranium.

20 In terms of the water pathways, it was a  
21 variable in the simulations because the geochemistry  
22 varies in the simulations. Uranium can cause  
23 significant impacts. If you have animal pathways,  
24 lead-210 shows up a lot in the poultry-related  
25 pathways, chickens and eggs primarily. And that is

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 because there seems to be a real sparsity of  
2 information related to the transfer factors for lead  
3 to chickens and eggs, although whenever I was working  
4 on it, I did find a few articles from Nigeria that  
5 people were looking at lead to --

6 MR. DORNSIFE: How about when a water  
7 pathway shows up other than uranium? What is the  
8 dominant radionuclide?

9 MR. ESH: Water pathway other than --

10 MR. DORNSIFE: For the water pathway, yes.

11 MR. ESH: I'm trying to think here.  
12 Lead-210, which can end up in the animal pathway,  
13 obviously gets there in the water pathway and can  
14 cause some water pathway exposures, too.

15 MR. DORNSIFE: Polonium?

16 MR. ESH: Pure drinking water is what  
17 you're asking, right?

18 MR. DORNSIFE: Polonium is not --

19 MR. ESH: Not plant and animals but would  
20 start with ingestion of water, right?

21 MR. DORNSIFE: Yes. I would have thought  
22 polonium because it has the lowest drinking water  
23 limit would be --

24 MR. ESH: Yes. I believe we saw polonium.  
25 I don't know. I would have to go back and look what

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 the specific breakdown was, but --

2 MR. DORNSIFE: Well, I guess just to  
3 quickly close out, you know, again, there is an issue  
4 there. If the water pathway-dominant radionuclide is  
5 below radon, you know, then it's potentially depleted  
6 with the radon pathway.

7 MR. ESH: I understand what you are  
8 getting at.

9 MR. DORNSIFE: And does the model do that?

10 MR. ESH: Yes. What we did in our  
11 calculation, which we keep talking about our  
12 calculation, but I don't see that our calculation is  
13 the 90 percent of this decision process --

14 MR. DORNSIFE: I understand. I guess I am  
15 talking more are there models that can represent that?  
16 I mean, if you are gassing off all of the radon,  
17 there is nothing left for the water pathway.

18 MR. ESH: I think you owe yourself when  
19 you are doing this type of calculation to be keeping  
20 track of your inventory and its daughters and where  
21 they end up in the process. So if you are leaching  
22 something out of your source area, then obviously you  
23 shouldn't be calculating a radon emanation from it  
24 when it is no longer there. You should keep track of  
25 where everything is, where it is partitioned

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 throughout your system, and estimate the impacts  
2 accordingly.

3 FACILITATOR CAMERON: Okay. Thank you.  
4 Thank you, all. Audience, anybody? Question?  
5 Comment?

6 (No response.)

7 FACILITATOR CAMERON: Okay. Let's take a  
8 break until --

9 MR. FUHRMANN: I am Mark Fuhrmann. I am a  
10 geochemist in the Office of Research at NRC.

11 Just a comment, taking up on what Mike and  
12 Peter had said a few times about chemical  
13 compatibility of the waste form itself. And here with  
14 these very large volumes of waste, some coming from  
15 new plants that haven't been built yet, it is sort of  
16 an opportunity to engineer that waste form to  
17 eliminate a lot of uncertainty that we see, which is  
18 in the leachability.

19 And here if we, instead of going to an  
20 oxide, maybe go to a phosphate, where we know what the  
21 solubility is and it is very limiting, that may give  
22 us very great opportunities in better, controlling,  
23 long-term releases of this type of waste.

24 FACILITATOR CAMERON: Thank you. That is  
25 from our Office of Research. Thank you very much.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1           Let's take a break, come back at 10:30.  
2           That gives you about 17 minutes. And we will go to  
3           radon and other unique waste streams.

4           (Whereupon, the foregoing matter went off  
5           the record at 10:14 a.m. and went back on the record  
6           at 10:38 a.m.)

7           FACILITATOR CAMERON: I think Larry has a  
8           clarification, but I want to make sure that Arjun and  
9           everybody are here for that. So why don't we get  
10          started? And then we will hold that clarification.  
11          Oh. Arjun is here, and Diane is here. So, Larry, go  
12          ahead. Everybody is here.

13          MR. CAMPER: I wanted to come back to the  
14          issues that were discussed shortly before the break  
15          with regards to the analysis that the staff use and  
16          use of the GOLDSIM and so forth and so on.

17          Arjun and I had a very nice discussion  
18          during the break. Thank you for that. I appreciate  
19          that.

20          What we are going to do is we are going to  
21          confer with the Office of General Counsel more closely  
22          on this question. I mean, you know, some of the  
23          information that is in there is, as you and I  
24          discussed, "pre-decisional."

25          What we are going to do is we are going to

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 see, to the maximum extent possible, what we can  
2 release on the work that we did, the PLAYER model, for  
3 example, and other things. So we will continue to  
4 have dialogue with OGC. And, to the maximum extent  
5 possible, we will make that information publicly  
6 available.

7 MR. MAKHIJANI: I truly appreciate that.  
8 And we did have a very nice conversation. Thank you  
9 very much, Larry.

10 FACILITATOR CAMERON: Great. Thank you.  
11 Thank you, both.

12 Karen, are you ready to talk about radon?

13 MS. PINKSTON: I am. Okay.

14 FACILITATOR CAMERON: All right.

15 MS. PINKSTON: So I will be talking about  
16 the modeling of radon in the environment in a  
17 site-specific analysis. So for some background, radon  
18 is present in the uranium-238 decay chain, which is  
19 shown up here on this slide, and is formed as 238U and  
20 its progeny decay. And, as David Esh pointed out in  
21 his presentation yesterday, radon is present naturally  
22 in the environment and is responsible for a large  
23 fraction of natural background radiation.

24 Radon-222 has a half-life of 3.8 days.  
25 And, unlike other radionuclides in the 238U decay

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 chain, radon is a gas. This causes it to have  
2 significantly different environment ability than the  
3 other radionuclides.

4 Radon also has daughter radionuclides that  
5 are charged and tend to stick to particles and  
6 surfaces so they can behave differently than radon,  
7 especially inside of buildings.

8 So, unlike natural uranium ore, depleted  
9 uranium has been chemically separated from its progeny  
10 and consists primarily of the uranium isotopes. And  
11 the daughter radionuclides are not present.

12 However, as shown in this graph, over time  
13 the daughters will in-grow. But because the  
14 half-lives of many of the radionuclides in the decay  
15 chain are extremely long, it takes a long time for  
16 radon to grow in.

17 So in this graph, it shows the amount of  
18 radon that will be formed from one curie of depleted  
19 uranium. As you can see, it doesn't hit its maximum  
20 amount of in-growth until about one million years or  
21 so.

22 So this shows a picture that we have seen  
23 earlier. And, as you can see in this picture, the  
24 radionuclides present in DU or any disposed-of waste  
25 can move through the environment by leaching from it

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 that can move through the groundwater from leaching or  
2 that radon and other gases can also diffuse upward  
3 through the cap to the surface.

4           Once the radon has diffused to the  
5 atmosphere, it can also be transported off site to an  
6 off-site resident. And if a residence or other  
7 structure were built directly above the disposal site,  
8 the radon then could diffuse directly into the  
9 basement or directly into the foundation.

10           So in determining the potential future  
11 exposure to radon, it is important to consider the  
12 uncertainty in the exposure scenario. The future land  
13 use of the site would affect the potential exposure to  
14 radon. For example, a person living on site would  
15 receive a higher dose than one living off site.

16           In addition, there is uncertainty in the  
17 type of structures that may be built on or near the  
18 site in the future. And properties of the structure,  
19 such as the size of the structure, the presence or  
20 absence of a basement and the type of ventilation  
21 system, could all affect exposure to radon.

22           There is also not known whether future  
23 generations would routinely test for radon and install  
24 radon mitigation systems in their building. Radon  
25 mitigation systems are relatively simple and are

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 fairly effective. So if a population in the future  
2 were to test for radon and install appropriate  
3 mitigation systems, the potential for being exposed to  
4 large amounts of radon would be greatly reduced.

5 So there are a number of significant  
6 challenges associated with the modeling of release and  
7 transport of radon. This is largely due to the short  
8 half-life that radon has. And so this results in the  
9 exposure to radon becoming highly dependent on how  
10 quickly it can move to the surface and whether or not  
11 it reaches the surface before it decays.

12 So small differences in the travel time  
13 that it takes for radon to move to the surface can  
14 result in huge differences in the amount of radon that  
15 reaches the surfaces and, consequently, huge  
16 differences in the dose that a person might receive.

17 So, in order for radon to be mobile, radon  
18 must first get from the solid waste to the gas phase.

19 So it is important to understand the amount of  
20 emanation of radon from radium in the solid waste form  
21 to the gas in the porous space and the factors that  
22 influence this.

23 Another considerable challenge in modeling  
24 radon transport is the modeling of diffusion through  
25 partially saturated porous media. This diffusion is

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 highly dependent on the moisture content of the soil.

2 And it is dependent in a highly non-linear way with  
3 moisture content. The moisture content of the soil  
4 can vary, both temporally and spatially within a site.

5 Another challenge to modeling radon is the  
6 uncertainty in the long-term performance of clay radon  
7 barriers. A clay radon barrier will only function as  
8 long as it is intact and the moisture content is high.

9 Any drying out of a clay layer would likely lead to  
10 cracking and to the barrier no longer working as well.

11 Finally, barometric pumping can increase  
12 the flux of radon from a subsurface to the surface.  
13 Barometric pumping is basically due to wind blowing  
14 across a site and causing suction to be pulled on a  
15 subsurface and radon to be brought up more quickly to  
16 the surface.

17 This effect is most pronounced in the case  
18 of a building being located directly above the  
19 disposal area because barometric pumping can greatly  
20 increase the amount of radon that gets brought into  
21 the building.

22 NRC staff is seeking public feedback on  
23 specifying criteria for a developing guidance related  
24 to radon. This includes methods for evaluating and/or  
25 regulating the impact of radon gas exposures. We had

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 some discussion yesterday about whether it would be  
2 appropriate to use the mill tailing standards instead  
3 of a dose limit.

4 We are also interested in approaches for  
5 modeling radon emanation transport and exposure  
6 pathways; parameter values used in the modeling of  
7 radon as it relates to the disposal of low-level  
8 waste; and, finally, the consideration of societal  
9 uncertainties in the modeling of radon.

10 FACILITATOR CAMERON: Thank you very much,  
11 Karen.

12 Let's go to our experts. First let's go  
13 to Steve Webb from Sandia. Steve?

14 MR. WEBB: Thanks. What I understand is  
15 that you are just using gas diffusion or --

16 MS. PINKSTON: I believe our model was set  
17 up just to have diffusion in the gas phase up to the  
18 surface. However, there was the ability for it to  
19 partition between, the radon could partition between,  
20 the gas phase and any moisture located in the liquid.

21 There is also the invective flow downward to the  
22 groundwater.

23 MR. WEBB: So it is also liquid feed  
24 diffusion comes in as well?

25 MS. PINKSTON: No. We didn't include the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 upward liquid diffusion in the model.

2 MR. WEBB: I'm not sure. What is the  
3 Henry's constant? Do you know the Henry's constant,  
4 by any chance? I don't remember what it is because  
5 oftentimes you will also have liquid phase diffusion,  
6 which is high, too. One other mechanism is basically  
7 heat evaporation. What they will give you is a large  
8 advection component.

9 One model you might want to look at is a  
10 1980 screening model Bill Jury developed. His first  
11 model is for pesticides. And he has a later model of  
12 buried chemicals. And what this is, near-surface  
13 model.

14 I have used this in the past because what  
15 I have modeled with chemical signatures from land  
16 mines, which are about a foot below the surface. And  
17 that is a real good screening model and with good  
18 validation with it, too. So it is a real good  
19 approach, and I can give you the references.

20 MS. PINKSTON: That would be helpful.  
21 Thanks.

22 MR. WEBB: And, of course, what I know,  
23 evaporation is highly dependent on episodic rainfall  
24 preferential paths. We have used the weather as well,  
25 not only adverse conditions but actual rainfall

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 events, and also, as we talked about yesterday, the  
2 barriers. What you have to consider, non-uniform  
3 properties, too, David. We talked about that  
4 yesterday a little bit off line.

5 That's it for me.

6 FACILITATOR CAMERON: Do you have  
7 questions for Steve?

8 MR. ESH: Yes. I didn't catch the 1980  
9 screening model. What was the author that you  
10 referred to for that?

11 MR. WEBB: Jury, Bill Jury. His first  
12 model is -- this was a four-part paper. And later on,  
13 like he also has a buried-chemical model. I've got  
14 the references with me that I can share with you.

15 MR. ESH: Okay. One thing that we were  
16 interested in hearing about from people, too, is, are  
17 they aware of data sources with regard to uranium  
18 and/or radon fluxes, actual measurements for lots of  
19 real systems? We tried to compile that sort of  
20 information as part of our work.

21 We found some with respect to radon  
22 emanation, a lot of cases from bare tailings, but we  
23 were very much interested in buried sources and data  
24 that could be used to constrain or provide support for  
25 radon modeling.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 We also looked at the radon that is in the  
2 environment and how that translates into exposures and  
3 houses and the variability that you can get from  
4 different conditions.

5 It gives you some information about how  
6 the source translates into an impact, but it would be  
7 much nicer if we had data sources that were more  
8 constrained or more well-studied that could provide  
9 you more cleanly that sort of information.

10 FACILITATOR CAMERON: Anything on that,  
11 Stephen?

12 MR. WEBB: No, I don't have anything for  
13 radon. No.

14 FACILITATOR CAMERON: Okay. Let's go to  
15 Peter. And then we will go to Bill and Felix.

16 MR. BURNS: I just had a couple of really  
17 quick comments I wanted to make. One is just for  
18 information concerning the clay barriers. Perhaps  
19 everybody knows, but perhaps they don't. I didn't  
20 know about these things until not too long ago.

21 There are clay deposits, mostly in  
22 Tennessee, that are called ball clay deposits. They  
23 are small lenticular types of deposits in the  
24 relatively near surface in the sediments that are not  
25 compacted in the rock. And these things are heavily

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 mined for use as food binders and in ceramics and so  
2 on.

3           They have been there over a million years  
4 in the near surface. And they are pretty spectacular  
5 when you go and look at them. They are essentially  
6 entirely made up of clay, anywhere from 3 or 4 feet to  
7 15 or 20 feet thick. And sometimes you can see them  
8 in road cuts. Certainly you can see them in all the  
9 different mines. So if one was looking for a  
10 long-term analogue to study to see how these clay  
11 barriers might persist, I would point you in that  
12 direction.

13           Anyway, on to a more substantive comment,  
14 I suppose, about the standards. The mill standards,  
15 mill tailings, and mine tailing standards presumably  
16 reflect the fact that the daughter products are  
17 already all there.

18           The uranium was in secular equilibrium  
19 when it was mined. And there is going to be roughly  
20 the same amount of radon coming out of that as there  
21 would be from a depleted uranium storage facility  
22 after a million-plus years.

23           So it seems illogical that one would  
24 suggest, at least at the outset, that the standards  
25 for radon emissions from a depleted uranium disposal

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 facility over, say, 10,000 years ought to be the same  
2 as a mill tailing site, where you have dramatically  
3 more radon to begin with.

4 FACILITATOR CAMERON: Karen, Dave, any  
5 comments or questions, observations?

6 MR. ESH: Do you know the clay layers that  
7 you are referring to, how deeply buried they are?  
8 Because one of the issues that has come up recently in  
9 our research group with respect to engineered barriers  
10 and, in particular, buried clay layers is it appears  
11 that the buried clay layers can maintain their  
12 functionality when they are kept wet, basically. But  
13 when they dry, they can lose their functionality. And  
14 they can lose their functionality very rapidly.

15 So in Craig Benson's work, it was  
16 sponsored, in part, by our research group. And we  
17 have a recent report. I could give the reference for  
18 people if they are interested.

19 He looked at exhuming or examining a  
20 number of these engineering caps and layers, et  
21 cetera, and determining what the actual performance  
22 was. And what he learned was that in some cases they  
23 don't perform very well.

24 There was a site in Georgia with a buried  
25 clay layer where they had a two-week drought, I think.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 And that two-week drought was enough. And it may  
2 have had about a meter of overburden above the clay  
3 layer. But that two-week drought was enough to dry  
4 the clay layer and crack it. And it was no longer  
5 effective hydraulically, which would probably mean it  
6 wouldn't be effective as a diffusion barrier either.

7 We are very sensitive to this. We are  
8 interested in covering this topic in our guidance for  
9 this and our other programs. But it really highlights  
10 the need to consider the episodicity of the driving  
11 functions on these systems and how they may impact the  
12 barriers.

13 That is why I was interested in if you had  
14 some information about the depth of those very  
15 long-lived clay layers.

16 MR. BURNS: I can send you some  
17 publication lists, but I was involved in a research  
18 project a few years ago on these clays because it  
19 turns out that they are loaded with dioxins. And that  
20 is a little off topic, I guess, clays loaded with  
21 dioxins. They showed up in fish feed and chicken feed  
22 and resulted in a lot of EPA problems with those food  
23 sources and a lot of incinerated chicken and the like  
24 when it was discovered.

25 My role in it was I was researching the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 origin of these dioxins. The conclusion was it was  
2 natural. There was no water infiltration through that  
3 clay at all in historic times. So there was no way  
4 that dioxins could be carried from, say, an Agent  
5 Orange spill or something down into those clays.

6 The Gunzner profiles and so on were  
7 totally unlike any known source of dioxins in any  
8 case. And so I went to some of these mine sites and  
9 studied them firsthand. And they are overburdened by  
10 one to two meters typically, maybe three meters, four  
11 meters in some places of sandy soil, mostly sand and  
12 similar beneath it. And then they have these clay  
13 layers.

14 The water comes down. And you have a mine  
15 face there where the clay layer is exposed. The water  
16 comes down and straight out of the mine wall. It  
17 doesn't seem to infiltrate the clay at all.

18 So in these situations, if the clay is  
19 wet, I would think it would take a very long time for  
20 it to dry completely. It wouldn't be a two-week thing  
21 at all. But that is in Tennessee, where it is not a  
22 desert.

23 I would be happy to send you some  
24 references if you would like.

25 FACILITATOR CAMERON: Thank you.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 Bill?

2 MR. DORNSIFE: Two comments. First, the  
3 radon pathway is very much dependent upon the period  
4 of performance issue. And saying that, I mean if the  
5 period of performance in terms of being able to  
6 demonstrate something is 10,000 to 50,000 years, then  
7 there probably needs to be some standard for radon  
8 emanation because you do get significant build-up  
9 similar to what you have in mill tailings during that  
10 time frame.

11 I strongly recommend that you not use a  
12 dose-based standard for radon emanation, that you use  
13 the mill tailing standard.

14 The second issue is when the radon issue  
15 becomes a problem, you know, at any given time, I  
16 guess initially it's not a problem, but when it  
17 becomes a problem, is there any concern about the  
18 pathway for radon daughters, either -- well, first of  
19 all, radon being dissolved in the water itself and the  
20 radon daughters, then, getting in the water in the  
21 cover or the radon decaying in the cover and then  
22 being available for transport off the cover. For this  
23 particular waste stream, does the staff think that  
24 that is a potential significant pathway? Because once  
25 you are in the cover, you are outside the so-called

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 isolation.

2 And I think that issue is potentially  
3 unique to this waste stream because, you know, let's  
4 face it. Radon is the issue here. I mean, if it  
5 weren't for the radon component, this would be no  
6 different than any other waste stream.

7 FACILITATOR CAMERON: Anybody want to talk  
8 to either of Bill's points: use the mill tailing  
9 standard or transport off the cover, including our  
10 experts: Steve and Mike, Peter? Karen, do you have  
11 anything, questions or anything on that, on either of  
12 those two points?

13 MS. PINKSTON: Well, on the second point  
14 with transport of the radon daughters, we would expect  
15 in a performance assessment for a phenomenon like that  
16 to be included, you know, if they can affect the  
17 ultimate dose, I think for the daughters to in-grow to  
18 the point where you would be having that happen, it  
19 would be well into the future.

20 MR. DORNSIFE: It would be what?

21 MS. PINKSTON: The time before that would  
22 happen would be a very long time into the future. You  
23 would have to have the radon in-grow first. But we  
24 would include that type of thing in a performance  
25 assessment.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. DORNSIFE: Well, again, depending upon  
2 the period of performance, it may or may not be  
3 important. You know, I mean, if your philosophy for  
4 period of performance is a qualitative one, you know,  
5 that you say, "Okay. If there is a society in the  
6 future that this is what you need to do, then you may  
7 want to consider that."

8 FACILITATOR CAMERON: Okay. Thanks, Bill.

9 Let's go to Felix and then Arjun. Felix?

10 MR. KILLAR: I just wanted to comment that  
11 if the NRC is looking for data, EPA has just initiated  
12 a study through the uranium miners. And what the  
13 aspect of the study is is they are asking them to  
14 moderate the evaporation rates around their mill  
15 tailings piles and ponds to see as the pond evaporates  
16 if there is radon carried off in that evaporation  
17 factor.

18 So it is an ongoing work. It just got  
19 started, but it may be something that the NRC may want  
20 to look at to see what impact or potential impact.  
21 That goes to one of the questions or points that Steve  
22 brought up earlier.

23 FACILITATOR CAMERON: Arjun?

24 MR. MAKHIJANI: Yes. Just in regard to  
25 the period of performance and a related question here,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 we would be against changing subpart C in this  
2 proceeding.

3 I understand there is a risk-informed  
4 proceeding coming. That is the proper arena in which  
5 subpart C should be considered because there you are  
6 considering overall risk from low-level waste and the  
7 classification as a whole, both in regard to period of  
8 performance and dose standards in regard to organs and  
9 whole-body exposure.

10 I recommended yesterday that you look at  
11 the French rule. I actually forgot to bring it with  
12 me. I think it might be at the desk upstairs. So I  
13 will distribute copies of the French rule after lunch.

14 FACILITATOR CAMERON: Great. Thanks,  
15 Arjun.

16 Michael?

17 MR. RYAN: Chip, you asked a question what  
18 are our thoughts on using mill tailings guidance?

19 FACILITATOR CAMERON: Yes. I am going  
20 back to Bill's first point about that the mill tailing  
21 standard should be used, rather than -- I forget what  
22 he --

23 MR. DORNSIFE: Well, just to talk a second  
24 about what my rationale is, is that if we use the  
25 25-millirem standard, Ma Nature can't meet that. How

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 the hell do you have a 25-millirem standard for radon  
2 emanation?

3 MR. RYAN: I'm lost here, Bill. I'm lost.  
4 What is your point about the mill tailings standard?

5 MR. DORNSIFE: Use the same standard for  
6 mill tailings, a 20-picocurie per square meter per  
7 second.

8 MR. RYAN: So it's the radon emanation  
9 rate is what you really want.

10 MR. DORNSIFE: Yes.

11 MR. RYAN: You don't really care where it  
12 comes from.

13 MR. DORNSIFE: Yes, right. Right.

14 MR. RYAN: Okay. Just wanted to be sure.  
15 I guess I am a little nervous about the idea that we  
16 would mix and match and take something from the  
17 uranium mill tailings and take something from  
18 somewhere else where the staff is, to my way of  
19 thinking, at a clean sheet of paper and try and  
20 develop something that is consistent and internal for  
21 the problem at hand.

22 So they may end up in that place, Bill,  
23 but I guess I think you would shortchange the efforts  
24 they have undertaken so far and are clearly here to  
25 gather information to look at the uranium material

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 question, whether it is uranium metal or uranium oxide  
2 or some other chemical form, apart from the mill  
3 tailings.

4 Mill tailings are relative homogeneous, so  
5 some range of concentration in a different set of  
6 substrates. I just don't know that the emanation  
7 standard that derives from that analysis would  
8 necessarily be appropriate or reachable or whatever  
9 with regard to what the staff has undertaken now.

10 So they may end up in some place like  
11 that, but I don't think just jumping right to the  
12 conclusion "That's the right answer" is appropriate.

13 MR. ESH: But I think just, if I could add  
14 to that, more generically the question is that if you  
15 get from natural sources a significant quantity of  
16 radon, should you limit it to a much lower value from  
17 a manmade source than from the natural sources is the  
18 basic question because that mill tailings flux rate  
19 standard, you can convert it into a dose. It's higher  
20 than 25 millirem generally.

21 So exactly what would you do? How does it  
22 work out? Do you think it is appropriate to do  
23 something different than lumping that in with the  
24 whole 25? We have heard from Arjun not to do that in  
25 this initial rulemaking now. That is a good comment.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 You know, what does everybody else think?

2 FACILITATOR CAMERON: Let's hear from --

3 MR. DORNSIFE: My recommendation is to do  
4 it that way since it is an existing standard for the  
5 same kind of risk and, let's face it, similar material  
6 in terms of what risk it ultimately presents.

7 FACILITATOR CAMERON: Let's hear from  
8 Diane.

9 MS. D'ARRIGO: Dave started to answer it.  
10 I wanted to understand the comparison of that  
11 20-picocurie per square meter generally means in terms  
12 of dose versus like the low-level waste disposals, 10  
13 CFR 61, 25-millirem, 25/75/25. Are those fairly  
14 comparable or --

15 MR. DORNSIFE: I don't know. I don't know  
16 what the --

17 FACILITATOR CAMERON: That's Dave --

18 MR. DORNSIFE: You know, it depends,  
19 obviously, what assumptions you make and how --

20 MS. D'ARRIGO: Right, always.

21 MR. DORNSIFE: -- the radon concentrates  
22 and, you know --

23 FACILITATOR CAMERON: Okay. Thank you.

24 MR. DORNSIFE: In air, it is probably not  
25 a big deal, but if you build a house over it, it could

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 be.

2 MR. ESH: Yes.

3 FACILITATOR CAMERON: Dave?

4 MR. ESH: I would generally agree with  
5 that. I don't think they are extremely dissimilar,  
6 but I think that the one is higher than the other,  
7 meaning that if you did take that flux standard into a  
8 dose rate, like you do in part 61 analyses, that it  
9 would give you a higher dose than what you would in  
10 the other one.

11 MS. D'ARRIGO: So if we were going to  
12 allow for depleted uranium to go into a 10 CFR 61  
13 facility that has class A capability, wouldn't we be  
14 requiring that it still meets the -- it couldn't add  
15 significantly to what is already licensed.

16 MR. ESH: The answer is right now under  
17 subpart C, if you included a radon in the dose  
18 analysis, which we haven't included radon in other  
19 low-level waste analyses or at least in the EIS that  
20 was done because it wasn't a significant source. But  
21 if you did include it in the analyses, right now it  
22 would have to be part of that 25, which was Bill's  
23 comment. But that is the discussion.

24 MS. D'ARRIGO: So that would mean that  
25 there would have to be less of the other? I'm just

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 not sure what --

2 MR. ESH: It would mean --

3 MR. DORNSIFE: It is a total dose of 25.

4 MR. ESH: Yes.

5 MS. D'ARRIGO: So if you would put a whole  
6 lot of depleted uranium in because there is a whole  
7 lot of it, then would it maybe displace the other  
8 stuff?

9 MR. DORNSIFE: It could exceed the 25.  
10 That is the issue.

11 MS. D'ARRIGO: But if you had to meet the  
12 25, then it could potentially prevent the other waste  
13 from going in because --

14 MR. DORNSIFE: Or prevent this from going  
15 in.

16 MR. ESH: Yes, one or the other. You  
17 would have to meet the 25, regardless of what you were  
18 putting in there. So if you had an inventory issue  
19 that was getting you to 25, you would have to make a  
20 decision about what inventory you wanted to put in  
21 there that would allow you to achieve your regulatory  
22 limits.

23 MR. RYAN: Again I am stuck with this  
24 because it's a really big, huge apples, oranges, and  
25 avocados mix here. We are talking about this radon

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 problem for most new materials as being something that  
2 occurs well into the future, past any life of the  
3 low-level waste that is disposed.

4 So the time frames are different. The  
5 materials are different. You know, I really don't see  
6 where you can just pull a standard down and say, "This  
7 is the one that ought to apply, for these reasons"  
8 without really thinking through all of these details.

9 MR. DORNIFE: Mike, I premised my comment  
10 on recognizing this is highly dependent upon what you  
11 do regarding period of performance. And if, indeed,  
12 your period of performance is 10,000 to 50,000 years,  
13 it could indeed be an issue. Okay?

14 MR. RYAN: At that point, it is the only  
15 contributor to the total dose. This idea of adding to  
16 low-level waste --

17 MR. DORNIFE: Why would you say that?

18 MR. RYAN: -- what part comes from what is  
19 gone.

20 MR. DORNIFE: What? Why would you say  
21 that?

22 MR. RYAN: What's left in 10,000 years at  
23 a low-level waste site besides uranium?

24 MR. DORNIFE: Transuranics, you know?  
25 Come on. There's a lot of --

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. RYAN: Dose consequences. The point  
2 is the devil is in the details. Just saying, you  
3 know, a priori that is the right number, I don't buy  
4 it.

5 FACILITATOR CAMERON: Okay. More needs to  
6 be done, looked at, context, according to Mike, before  
7 you would just adopt the 25-millirem standard.

8 MR. DORNSIFE: I have no problem with  
9 that.

10 FACILITATOR CAMERON: Before we go to Tom  
11 and to Steve, then to Tom, Diane, did you get the  
12 answer to your question?

13 MS. D'ARRIGO: Well, I think maybe I am  
14 starting to understand things a little better of what  
15 Bill has been trying to say. I am just trying to --  
16 it is my understanding that, even in class A, you've  
17 got long-lasting radionuclides. Somebody may make a  
18 determination that it is an insignificant dose, but  
19 you still have long-lasting waste in there.

20 And class A is supposedly only hazardous  
21 for 100 years. So that is why I have always been kind  
22 of astounded that depleted uranium could now become  
23 class A or that anything that isn't, you know, that  
24 (a)(6) phrase, that anything that isn't listed in the  
25 charts would become class A when class A is only

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 really supposedly 100 years hazardous. So that has  
2 always been one of the issues in 10 CFR 61 that has  
3 been a problem.

4 FACILITATOR CAMERON: And that's the issue  
5 now, isn't it, because of the significant quantity?

6 MR. ESH: That is why we are here having  
7 this workshop because we acknowledge that that is an  
8 issue and we hope to correct it. And there may be a  
9 lot of different processes or methods you could go  
10 about to correct it, but we are eventually going to  
11 get there to correcting it.

12 MR. DORNSIFE: Just for closing, hopefully  
13 a closing comment, I mean, the reason --

14 FACILITATOR CAMERON: We are all for  
15 hoping.

16 (Laughter.)

17 MR. DORNSIFE: The reason for doing a  
18 long-term peak dose analysis, as NRC requires in their  
19 guidance, is to, in fact, whether it is A, B, or C,  
20 look at mobile, long-lived radionuclides that are in  
21 A, B, and C. And that long-term mobility analysis is  
22 intended to show that, even under worst-case  
23 conditions, you don't exceed the 25-millirem.

24 I mean, you know, the concept that  
25 everything decays away in 100 years is not valid.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 FACILITATOR CAMERON: Okay. Tom, let's go  
2 to you. And then I am going to ask if Stephen has  
3 something.

4 MR. MAGETTE: I would like to try to come  
5 back to the agenda topic. I know it is a wild and  
6 crazy thought, but stick with me here. Because all of  
7 this is related in some way not only to this topic but  
8 to some of the things that we talked about yesterday  
9 and I tried to capture them in kind of one thought  
10 yesterday and I would like to come back to that, the  
11 notion that any scenario development is a guidance  
12 topic, it should be site-specific, and that there are  
13 important issues to be addressed in the rule, I  
14 believe, to go beyond simply requiring a performance  
15 assessment for depleted uranium or unique waste  
16 streams, which is why I have come to subpart C, is the  
17 appropriate place to capture those things.

18 We talked about a period of performance  
19 yesterday, talked about dose standards. The reason I  
20 bring those up is because I think they are  
21 appropriately addressed in a rule. They are in  
22 guidance today. The values that we talked about and  
23 the ones I proposed yesterday are the ones from  
24 guidance.

25 You can leave them in guidance and save

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 subpart C for another day, but I think what that does  
2 is cloud the issue when you are talking about a  
3 performance assessment that is focused on unique waste  
4 streams; in particular, depleted uranium, because it  
5 is different from what has been traditionally captured  
6 under the regulations in part 61. That is why I think  
7 it is important to pull that into the regulation.

8 Tying this together, Mike's comment  
9 yesterday that if you want to ask me, if you are going  
10 to pin me down on what I think the appropriate period  
11 of performance is, I want to be simultaneously pinned  
12 down on some other points. I can't pick that alone.

13 I think he is making the same point  
14 without saying so today on the radon emanation  
15 standard. And I agree with that point, although I  
16 agree with where Bill is headed in terms of that being  
17 an appropriate way to address radon in the long term.

18 So here again I think we have if we look  
19 at this big picture and this notion of how does one  
20 model these things in the environment, including, as  
21 Karen has asked for input, how do we select these  
22 scenarios and deal with these other issues, to me you  
23 kind of have to capture them all together. I don't  
24 think, as Mike said, you can pull any one of them out  
25 of the air.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 I don't necessarily object to the concept  
2 that subpart C is a different matter. I just think  
3 you have left a gap if you don't address that today.  
4 And it will be a vacuum that some other force will  
5 fill given the natural gas behavior of government  
6 agencies.

7 So we either fill that vacuum today or we  
8 allow for a wide spectrum of unintended consequences.

9 That is all.

10 FACILITATOR CAMERON: Thank you. Thank  
11 you, Tom. Thanks for tieing Mike's concern into all of  
12 this.

13 Steve?

14 MR. WEBB: Well, I want to make one  
15 clarification. When I mentioned the evaporation rate,  
16 I was not referring to the surface rate, rather,  
17 underground rate, which is off the water table or  
18 vadose zone. It's just a clarification there I want  
19 to make.

20 MR. ESH: Yes. I think we understood your  
21 comment.

22 FACILITATOR CAMERON: Thank you. Thank  
23 you, Steve.

24 Anybody in the audience? You have heard  
25 this discussion. And Tom sort of wrapped it up for

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 us, brought it back to something he said yesterday.  
2 Yes, Chen?

3 MR. CHEN: Yes. I want to talk about the  
4 consistency issue that we cannot talk about because if  
5 you cannot do the performance assessment, you have a  
6 consistent unit you had to use.

7 For example, if you are going to talk  
8 about peak dose, then you are measuring unit dose.  
9 There is no escape from that. So you cannot mix dose  
10 with flux or with some other things and try to find  
11 out what your peak measure is going to be. So it had  
12 to be dose at some point.

13 But coming back to what Bill says, I mean,  
14 this whole notion about 10,000 years or whatever  
15 beyond that, it is because of your decision of finding  
16 where the peak dose is for protection purposes. So  
17 you have got to have that decision to make to say what  
18 will be the protection measure that you have and  
19 consistently use throughout. So I just say there is  
20 probably not much escape from using dose.

21 But come back to the issue about radon.  
22 Radon is a very different animal. I mean, that  
23 conversion factor there, you know, will probably  
24 become too restrictive for you to be applying to  
25 depleted uranium.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1           So I think that is a very difficult issue  
2 that we had to wrestle to see what will be the common  
3 measures that you have to define these whole  
4 protection issues, at the same time not to be too  
5 restrictive in constricting what you will be putting  
6 in the waste disposal site there.

7           FACILITATOR CAMERON: Thank you.

8           I saw David Esh nodding his head in  
9 affirmation on that. Dave, do you want to add  
10 anything?

11          MR. ESH: No.

12          FACILITATOR CAMERON: All right. Anybody  
13 else in the audience on the radon issue that we have  
14 been discussing? Diane?

15          MS. D'ARRIGO: I have a beginner question.  
16 Are people around the places where the DU is now  
17 stored getting large radon doses right now?

18          FACILITATOR CAMERON: Dave, do you want to  
19 tackle that one or Karen?

20          MS. PINKSTON: Right now the DU doesn't  
21 contain very much radon just because it hasn't  
22 in-grown yet. So if you look at the graph on I think  
23 the second or third slide, it shows how much radon  
24 would be there from DU over time. And so you don't  
25 really start getting any significant amounts of radon

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 until I think after 100,000 years or so.

2 FACILITATOR CAMERON: So that the people  
3 living around the site are not being exposed to radon  
4 from the DU, at any rate?

5 MS. PINKSTON: Right.

6 FACILITATOR CAMERON: Okay.

7 MS. D'ARRIGO: So the tension, then, is  
8 between -- I am just reiterating from earlier as I  
9 realize what is going on. So the tension is that we  
10 don't really have to worry that much about radon now  
11 in our 10 CFR 61 time frame. We have to worry more  
12 about groundwater. Is that right?

13 And then down the pike, long after the  
14 license has expired, if the 10 CFR 61 criteria stay in  
15 place, then there is a potential radon problem or  
16 wherever it is in storage.

17 MR. ESH: Yes. I think that is a pretty  
18 good summary of the issue. Of course, the groundwater  
19 can be a shorter-term issue or it can be a much  
20 longer-term issue also, just like the radon, depending  
21 on the site characteristics, properties, geochemistry,  
22 et cetera. But you gave a pretty good summary of it.

23 FACILITATOR CAMERON: Great. Thank you.  
24 Thank you, Diane. Thanks.

25 Let's go to unique waste streams, see if

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 we can get that done. And then we will see where we  
2 are, and we will take lunch. Dave is going to tee  
3 this one up for us.

#### 4 ISSUE 2: UNIQUE WASTE STREAMS

##### 5 INTRODUCTION

6 MR. ESH: Okay. So definition of unique  
7 waste streams. I imagine this one is going to be a  
8 little bit tricky. I know we have spent a lot of time  
9 talking about depleted uranium and the technical  
10 issues associated with depleted uranium. But in my  
11 view based on what I am looking at going forward, this  
12 definition of unique waste streams and how you develop  
13 regulatory requirements for it is going to be as  
14 time-consuming as the other part for me personally  
15 because we have to try to decide, are we going to try  
16 to anticipate what these waste streams may be? And if  
17 not, what generic process or requirements are we going  
18 to put in place to capture future ones so that we are  
19 not back at this point 20 years from now?

20 So in the 10 CFR, just a little bit of  
21 background, 10 CFR 61 developmental analysis in the  
22 1980s, as I said in my introductory talk, they  
23 considered a variety of waste streams. They separated  
24 them into groups and then different types within those  
25 groups and made isotopic distributions within those

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 groups and basically did a giant summation of our  
2 groups and isotopic distributions and arrived at some  
3 inventory estimates.

4 It was a pretty detailed analysis and a  
5 pretty decent job, I would say, if I had to do that  
6 work back in the day when they did it, the 1980s, I  
7 don't know what differently they could have done.

8 I am asking you to put on your thinking  
9 caps and try to look forward or even look current and  
10 look forward and say, what is out there? What is  
11 potentially out there, number one, that could fall  
12 into this same sort of category we are now with  
13 depleted uranium?

14 Number two, if I am not that smart and I  
15 can't say what is coming down the road, what do I need  
16 to put in place to handle it when it does come down  
17 the road in the future? Those are the two things that  
18 I am going to have to try to do. And so whatever  
19 input I can get from you to help me with that task, I  
20 would appreciate it. I think that is it.

21 Oh, just a little bit. We have already  
22 been through this, the decay characteristics, a little  
23 bit different or a lot different. Quantities disposed  
24 of were much different than anticipated in the 1980s.

25 So those are a couple of ways you could

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 identify uniqueness. If it behaves differently than  
2 the other things than you thought, if the quantities  
3 or concentrations are significantly different than  
4 what you thought, there might be some other  
5 considerations to define uniqueness. And I don't  
6 necessarily know what they may be, but we have a lot  
7 of smart people here to help me do that.

8 So that's it.

9 FACILITATOR CAMERON: Okay. Thanks, Dave.

10 And I take it from that you said that there could be  
11 a number of different components to this discussion or  
12 to how the NRC deals with this in the rulemaking.

13 One would be to identify a specific waste  
14 stream now, say this is like DU. The other way to do  
15 it would be to say let's establish some  
16 characteristics, generic characteristics, that would  
17 help us to do this.

18 And I guess the other aspect is some sort  
19 of a process mechanism in the rule that would alert  
20 the NRC to do something. Is that basically it?

21 MR. ESH: Yes. And, you know, I think we  
22 need to strive for simple and crispness, if possible,  
23 in this area. If we would go in like a  
24 definition-based approach, my experience has been we  
25 run into a lot of difficulties when regulators aren't

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 specific enough in certain areas.

2 And then everybody runs off and tries to  
3 interpret. And they all interpret definitely, and  
4 they all argue with each other when it could have all  
5 have been solved if you were more crisp up front with  
6 what you intended. So I would ask to consider that.

7 One of the things that I have struggled  
8 with or talked with some people about and debated is  
9 right now you have an estimate of what was assumed for  
10 an inventory in the EIS that was developed in the  
11 1980s.

12 So it is unique defined by anything that  
13 is not in that inventory. I mean, we kind of got  
14 there with depleted uranium by that. I am saying it  
15 wasn't in that inventory. Therefore, we need to  
16 consider it.

17 But is that a practical approach to do  
18 going forward? I don't know whether that is practical  
19 or not. It seems problematic if we have to try to  
20 compare things to an inventory. If you give a  
21 snapshot of what you think inventory is and then you  
22 say anything that is not in it, you have to go into  
23 some process.

24 I don't know how workable that is. It is  
25 certainly an option, and we are open to all options.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 And maybe that is the option we would select, but this  
2 seems this is probably an unappreciated, challenging  
3 area in this process for us.

4 FACILITATOR CAMERON: Okay. Thank you.

5 Let's go to Tom.

6 MR. MAGETTE: Thanks, Chip.

7 Actually, this is a fully appreciated,  
8 challenging area. I am not quite sure how you do it.

9 I don't think not defined in the original rulemaking  
10 means unique. It may have not been defined. That  
11 doesn't make it unique. So I don't think that is the  
12 right definition.

13 Arjun has suggested that some of the  
14 things that I have proposed are better left for this  
15 next rulemaking, the reevaluating part 61 rulemaking.

16 I disagree for a couple of specific reasons in terms  
17 of what I think is best done today, but I accept that  
18 that is a very rational position.

19 I understand why he says that. I can  
20 certainly appreciate that that would be a way to go.  
21 And I see this as also something that fits better in  
22 the next rulemaking.

23 I can't find a way to get comfortable with  
24 the concept of other. I don't see how you can put  
25 into a regulation "other." I just don't see how you

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 are going to get a definition that will ever be  
2 anything but the basis for numerous long-winded  
3 arguments. I just don't think you are going to get  
4 there from here.

5 So if you suggest that this is something  
6 that fits better in the next rulemaking, then what  
7 that does is it puts it, along with everything else  
8 that you may dispose of, in the context of having to  
9 be assessed via a site-specific performance assessment  
10 for compliance with subpart C or what it may become.

11 So you would look at what is there on a  
12 site-specific basis. And that is how you assess what  
13 is suitable. The notion of risk-informing part 61  
14 would capture this.

15 Other ways to capture this I am afraid, I  
16 haven't heard a definition that works yet. So I don't  
17 have one for you. My suggestion is that you put this  
18 notion off into the risk-informing question.

19 FACILITATOR CAMERON: Okay. Thank you for  
20 that recommendation.

21 Let's do this side. Then we will go over  
22 to Bill and Christine. Felix?

23 MR. KILLAR: Yes. I endorse Tom's  
24 comments for somewhat of a different reason. When you  
25 go out and start trying to determine what is unique,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 there is no clear-cut definition of what unique is.  
2 And so by creating a definition of what is unique, you  
3 have just created another term and another group. But  
4 then you are going to have somebody come back and say,  
5 "Well, gee, I think that's over here." And you say,  
6 "No. It should be over there. It should be in this  
7 unique definition."

8 I think that you end up with more problems  
9 by creating a unique category, unique definition than  
10 you are going to solve by doing a unique definition.  
11 So I think that I am sort of in Tom's camp here to the  
12 extent that the -- you know, I don't think that we  
13 need to get into this issue right now because I don't  
14 know that we have identified anything other than  
15 depleted uranium.

16 One of the areas I work in is in  
17 recycling, what have you. And one of the things we  
18 are concerned about is waste streams that come out of  
19 recycling facilities.

20 For the most part, we have been able to  
21 classify those fairly well into the existing  
22 classification range. We haven't identified any that  
23 are unique, so to speak.

24 So, once again, I am concerned -- and that  
25 actually was my discussion yesterday -- that when you

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 start getting unique, you make sure you are talking  
2 about uniqueness of the isotopes, uniqueness of the  
3 material, not of the stream it came from, not from the  
4 facility it came from, not whether it came from a  
5 recycling plant or a fuel fabrication plant or  
6 enrichment plant. You are looking at the particular  
7 material and the characteristics of that material.

8 So stay away from uniqueness. As a result  
9 of the source of material, you are looking at the  
10 characteristics and the environmental characteristics  
11 of that material goes forward.

12 So yes, I think uniqueness is a very  
13 difficult topic to try and address. I think that it  
14 really needs to be postponed until we have some of  
15 these other things behind us.

16 FACILITATOR CAMERON: Thanks. Thanks,  
17 Felix.

18 Diane?

19 MS. D'ARRIGO: As I understand the way  
20 that 10 CFR 61.55 was developed, it was by  
21 characterizing nuclear reactor waste and then fitting  
22 everything else that was radioactive waste into this  
23 categories. And so we are continuing to do that, it  
24 seems.

25 The Sierra Club policy that was adopted

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 back in -- I don't know if it was the '80s or the '90s  
2 -- was to limit the longevity of the waste that goes  
3 into a site, into the institutional control period of  
4 the site.

5 So that if the radioactive waste facility  
6 were going to have 100 years of institutional control  
7 that nothing should go in that was going to remain  
8 hazardous longer than 100 years, then we get into the  
9 debate about what is hazardous and all of that. And  
10 then we get into that when we talk about doing  
11 risk-based categorization of waste.

12 And that has so many uncertainties and  
13 dependencies on it that it makes it very difficult for  
14 the public to know what anything is. It is a shifting  
15 ground.

16 And also there is a difference in what the  
17 risk is. The waste generators and the waste  
18 receptors, as we are called, have a different  
19 perception of the risks. And so that is not  
20 necessarily the answer.

21 So I wanted to just put that out.

22 FACILITATOR CAMERON: Okay. And anybody  
23 who wants to comment on that as we go along, please  
24 feel free to do that.

25 Michael? And then we will go to Bill and

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 Christine.

2 MR. RYAN: Thank you, Chip. I have been  
3 struggling a little bit with, how do I get to what  
4 unique is? A couple of thoughts as you gave your  
5 presentation that hit me, I will offer the list of  
6 waste that you kind of showed the picture from the  
7 draft and final EIS. Be careful because I wonder how  
8 those inventories were created. Were they created off  
9 manifests or by other kinds of data?

10 So there is a little uncertainty in those  
11 data likely. And I am going to bet they are on the  
12 conservative side. They are probably overestimated.

13 So we don't want to pile conservatism on  
14 conservatism to try and come up with some radiological  
15 definition or curie definition of unique waste. To  
16 me, the uniqueness of the circumstance we are talking  
17 about this week is large, bulk quantities of uranium  
18 that is relatively pure and then over millions of  
19 years becomes more like natural uranium. Sure, that  
20 is unique, but I struggle with, how do you get to  
21 generalizing that definition?

22 I would say things that fall out of a  
23 first pass at a performance assessment kind of  
24 approach would be the only way to try and get at it.  
25 And there are many examples where unique circumstances

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 have been evaluated and approved at disposal sites all  
2 over the country with that approach in mind.

3 So, rather than try to come up with a  
4 definition, if you came up with as licensees evaluate  
5 waste stream as appropriate or regulators evaluate  
6 waste streams as an appropriate waste and determine  
7 they are not, then they ought to go to this unique  
8 waste process perhaps. I mean, I am just trying to  
9 give a little structure to the idea of unique and what  
10 it would mean to me.

11 Steam generators, reactor vessel, other  
12 things have been disposed at the disposal sites based  
13 on a kind of a 61 analysis but specific for those  
14 issues and the special features under which those  
15 materials are disposed.

16 So I would tend to get away from trying to  
17 define unique and stick with the fact we have got a  
18 process that evaluates slightly different cases of the  
19 relatively same material, fission products activation  
20 products and source material and all of that.

21 And if you want to mine what's been done  
22 and how that has been done, that may give you some  
23 insights as to what a good way to make that process  
24 more regular might be.

25 MR. ESH: So if I just sort of can

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 summarize, you think there are existing processes that  
2 handle many of these unique situations appropriately?

3 Do you think that they are robust enough or clear  
4 enough for both the licensees and/or the state  
5 regulators -- maybe we will have the state regulators  
6 speak to it -- to know when they might be in that  
7 situation?

8 MR. RYAN: You know, from my own personal  
9 experience, I would say this is the first one, you  
10 know, the long-term large quantities of uranium where  
11 we are outside of the box that good decisions have  
12 been made in my experience. So this is in 30 years  
13 fairly unique for me or different. I shouldn't use  
14 the magic word "unique."

15 So I would say there are many, many cases  
16 where things that are by concentration greater than  
17 class C waste, like strontium-90 eye applicators can  
18 be put in the stainless steel capsule and grouted shut  
19 and averaged over that inner steel capsule. And it's  
20 class A, as it should be, because it is a teeny, tiny  
21 quantity of strontium.

22 And waste streams have evolved from large  
23 blocks of very dilute water being solidified in  
24 concrete to now very concentrated solid materials.  
25 And all of those things have evolved over this 30-year

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 period. And they have all been handled okay because  
2 ultimately it is the inventory that drives the  
3 disposal risk.

4 So I would say this is really something to  
5 put on the table until later on and rethink it a  
6 little bit more and maybe even do some specific  
7 information gathering on the history of special waste  
8 analysis to better inform what questions you could  
9 ask.

10 FACILITATOR CAMERON: Okay.

11 MR. RYAN: Thank you.

12 FACILITATOR CAMERON: Bill?

13 MR. DORNSEIFE: If your criteria for  
14 determining what a unique waste stream is, in fact,  
15 whether it was adequately analyzed in the original  
16 documentation for part 61, if that is the criteria,  
17 then I think there are three, at least three, waste  
18 streams that need to be looked at to make sure that  
19 was, in fact, done that are very similar to this  
20 depleted uranium waste stream.

21 The first one is -- well, two of them are  
22 actually source material. There is regular old source  
23 material that is not depleted. Were the assumptions  
24 in the original part 61 adequate to assess that issue?

25 The second waste stream that is very

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 similar -- and it becomes a problem even sooner -- is  
2 the thorium-232 waste stream.

3 The third one is the enriched uranium  
4 waste stream.

5 And then at the very least, you need to  
6 assure yourself that these are not unique in the same  
7 way that depleted uranium is unique. Okay? And for  
8 future purposes, I think there is another waste stream  
9 or waste streams, that you need to make the same  
10 assurance that they were adequately assessed in the  
11 original documentation. And that is those transuranic  
12 waste streams that decay through neptunium and the  
13 fact that neptunium typically is a lot more soluble  
14 than the parents.

15 FACILITATOR CAMERON: Okay. Thanks, Bill.

16 Before we go to Christine, let me just ask  
17 Tom a clarifying question. You started off when you  
18 were giving suggestions on this saying that the  
19 analysis that was done for original part 61 should not  
20 be the driver on this. Is that in conflict with what  
21 Bill is saying or not really on point?

22 MR. MAGETTE: I don't think it is  
23 necessarily in conflict with what Bill is saying. I  
24 don't mean to -- I am just saying that as a starting  
25 point for many of the same reasons that Mike listed,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 but that is not necessarily a really good starting  
2 point.

3 Are there other things that might ought to  
4 be looked at, as Bill suggested?

5 FACILITATOR CAMERON: Okay.

6 MR. MAGETTE: Those are two completely  
7 different questions in my mind.

8 FACILITATOR CAMERON: All right. Okay. I  
9 just wanted to make sure of that. Christine?

10 MR. ESH: I'm sorry. Let me jump in here  
11 real quick. I didn't want to say that those  
12 approaches that I mentioned weren't the only  
13 approaches. They were just a couple of ideas, right.

14 So there are lots of other ideas. Ultimately you  
15 want to ensure safety of what you are disposing of.

16 So there might be an approach like a  
17 screening method or something that you could put a  
18 waste stream in to say, "Does it bump me into this  
19 process?" Right? You do some sort of safety  
20 screening process, say, "Am I kicked in there? If I  
21 am kicked in there, now follow this process to ensure  
22 that it is safe."

23 MR. DORNIFE: And that is exactly my  
24 point. I mean, based on the methodology you all have  
25 come up with, the depleted uranium, you at the very

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 least need to go use the same methodology to look at  
2 these other waste streams that have in-growth and  
3 could create potential problems and assure yourselves  
4 it was adequately covered. And the uniqueness about  
5 DU is that it was not.

6 MR. MAGETTE: I think what I was  
7 suggesting actually takes what David and Bill were  
8 just saying even a step further, which is, instead of  
9 looking for something to kick you into that, so to  
10 speak, or trying to create a definition of things that  
11 if we discover them a decade from now, yes, that is  
12 one of them. And it kicks me in, that we, I believe,  
13 are on the threshold of a rulemaking that will clarify  
14 and specify that everybody is already there.

15 I mean, there is an interpretation of  
16 subpart C that says everybody should be doing that  
17 today. And what I think we are suggesting is that  
18 clarify and codify that that is the case.

19 That then captures everything. You can  
20 call it unique. You can call it rare. You can call  
21 it common. It doesn't matter.

22 FACILITATOR CAMERON: Mike?

23 MR. RYAN: You know, one way to think  
24 about this to me, David, is that there are wastes that  
25 are well-understood, well-analyzed, and well within

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 the wheelhouse of 61. And there are some wastes,  
2 uranium, depleted uranium being one, that are not.

3 So it is not unique. It just hasn't been,  
4 you know, either fit into the system or taken out of  
5 the system. So I am a little nervous about trying to  
6 come up with a definition of unique when we are really  
7 asking the question, have you done a performance  
8 assessment for this quantity of these materials at  
9 this site or not?

10 So, again, I am kind of back to the if the  
11 process of doing that performance assessment takes the  
12 next step from what was done in the '70s and '80s and  
13 gets to this more modern way to calculate stuff and  
14 can analyze a whole lot more parameters a whole lot  
15 faster and a whole lot more transparently, that is  
16 where to put the energy, rather than try to come up  
17 with a definition.

18 FACILITATOR CAMERON: Okay. Let's hear  
19 from Christine. Christine?

20 MS. GELLES: And, again, as I guess a  
21 preface, I don't think I have any new ideas here, but  
22 what I would like to just spend a few moments doing is  
23 offer DOE's experience as a validation of all of the  
24 points that I heard here.

25 We do rely on site-specific performance

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 assessments. And by virtue of that, we establish our  
2 waste acceptance criteria. But DOE doesn't enjoy  
3 homogeneity in its waste streams.

4 We have a lot of different waste streams.

5 And the difference in the waste streams has to do  
6 with the concentrations and the characteristics, not  
7 necessarily the origin, what process originated or  
8 created the waste, the waste stream or its specific  
9 form.

10 So we have decades of practice of  
11 considering whether or not "unique waste streams," new  
12 waste streams, new concentrations of old waste streams  
13 can be accepted at our existing facilities, even  
14 though they might exceed the waste acceptance criteria  
15 that were established. And what we do is we run  
16 special analyses. We rerun our performance assessment  
17 to determine if they can be an acceptable.

18 So, first off, I agree with what Mike  
19 said, that trying to define what a unique waste stream  
20 is is as problematic as trying to define what a  
21 significant quantity is. I think it misses the mark.

22 Instead, let's continue on the path of establishing a  
23 process where today we work towards creating a  
24 framework where site-specific analyses are relied  
25 upon.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1           And then in the future, as Tom suggested,  
2 perhaps for the longer-range rulemaking, you consider  
3 establishing the process for running special analyses  
4 when new or "unique" waste streams require some sort  
5 of analysis. I think it really boils down to a graded  
6 approach.

7           In terms of the experience across the  
8 nation, I think many of those experiences probably  
9 exist at DOE facilities. The strontium-90 example you  
10 gave is perfect. That is a real-life example. And we  
11 have lots of case studies of how we have done this  
12 that we would be happy to share with the NRC as they  
13 try and move forward on this.

14           FACILITATOR CAMERON: Thanks, Christine.  
15 I think we are seeing commonality of views coming out  
16 of the recommendations to the NRC here.

17           Let's hear from Diane. Then we will go to  
18 Mark and Arjun and Bill. Diane?

19           MS. D'ARRIGO: I wanted to ask Felix, when  
20 you mentioned recycling, did you mean the reprocessing  
21 definition or the processing that is going on for  
22 low-level waste, that there are new forms? I want to  
23 understand what you meant.

24           MR. KILLAR: What I was referring to, when  
25 I say, "recycling," I'm talking about closing the fuel

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 cycle. So we are taking spent fuel, partitioning the  
2 various products into recoverable materials that are  
3 reused and recycled back into power plants.

4 And then you end up with some waste  
5 products. We will end up going to both low-level  
6 waste disposal facilities as well as high-level waste  
7 disposal facilities.

8 MS. D'ARRIGO: Because you were talking  
9 about reprocessing and not the new waste forms that  
10 are coming out of the processors of low-level waste  
11 and that other level of waste. Yes. Okay.

12 MR. KILLAR: Okay.

13 MS. D'ARRIGO: I'm wondering. Actually,  
14 it made me wonder if the processors' waste, you know,  
15 how does that -- I guess they analyzed that for waste  
16 acceptance at the existing sites. And they are trying  
17 to process it so that it meets existing waste  
18 criteria.

19 MR. KILLAR: Well, the answer is similar  
20 to what the gentleman from the NRC said earlier. We  
21 will look at the characteristics that the waste has to  
22 have in order to go into existing disposal facilities.

23 We will do the processing on those materials, those  
24 waste streams to make sure that they are consistent  
25 with those characteristics that are acceptable at the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 disposal facilities.

2 FACILITATOR CAMERON: Thank you.

3 Mark and then Arjun? And then we will  
4 come back over here and get to the audience. Larry  
5 has an answer to a question before we break.

6 MR. CAMPER: I have a question for the  
7 group, too, when you are ready.

8 FACILITATOR CAMERON: Okay. Well, let's  
9 get these cards. And then the question to the group  
10 concerns this subject?

11 MR. CAMPER: Yes.

12 FACILITATOR CAMERON: Okay. Go ahead,  
13 Mark.

14 MR. YEAGER: I wanted to kind of add o to  
15 what Mike had mentioned earlier. When Richard tasked  
16 me with the questions that NRC proposed in preparation  
17 for this meeting to define unique waste streams, that  
18 is kind of the same conclusion Mike came to. It is  
19 really not much you can do to redefine the issue based  
20 on isotopes but mostly waste form.

21 One of the things that agreement states  
22 are all having to deal with now because of -- I am  
23 going to use this as an example, a unique waste  
24 stream. And luckily it is something that is currently  
25 very manageable so far is the need for drinking water.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 There are a lot of wells that used to not be used for  
2 drinking water because of the limitations of EPA on  
3 concentrations of natural uranium and radium.

4 So we have had to do a lot of  
5 site-specific analysis for disposal of residuals,  
6 filter media. And Dan Schultheisz and EPA have worked  
7 a lot on that effort as well.

8 And through our own regulations, for  
9 example, small quantities of source material, we  
10 basically have issued a general license, which is, in  
11 essence, a copy of our regulations for a generator of  
12 filter media in the upstate part of our state that is  
13 going to accrue uranium over time in filter media,  
14 very small concentrations but very unique for us  
15 because we never had to address that before.

16 Again, general license, it's perfectly  
17 fine for them to proceed. But with the water  
18 filtration, again, a site-specific model, RESRAD model  
19 is issued because when that material has to be  
20 disposed of, it usually goes to a subtitle D landfill.

21 And that justification is used.

22 One of the other things that I will bring  
23 up -- I know this is really off the wall, but it needs  
24 to be addressed -- availability through the  
25 restrictions of the compact system, Low-Level

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 Radioactive Waste Policy Amendments A.

2           There is a potential for waste streams  
3 that we can anticipate being generated by  
4 jurisdictions that don't have access to compact waste  
5 sites. And that is just the reality of the situation.

6           That affects not only states, but it  
7 affects federal agencies with sites that aren't in  
8 compacts. So what is the alternative? The  
9 alternative is disposal at DOE facilities, whether it  
10 is interim or permanent storage.

11           Now, where are most of these federal  
12 facilities located? They're located in states that  
13 currently or formerly hosted low-level waste sites.  
14 That doesn't go over well with the public in terms of  
15 here we are. We did our duty. We took it for the  
16 team. And now more stuff is coming in.

17           So we are talking regulation, and I  
18 understand that, but I just wanted to make the comment  
19 that there are policy issues involved as well.

20           Another thing that Richard and I have been  
21 kind of pulled into over the past few years has been  
22 homeland security. And this is where I am kind of  
23 stretching it, but it is a reality, although extremely  
24 remote, that if there was a deployment of an RDD, for  
25 example, you could very well have a lot of very low

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 concentrations of debris and soil that need to be  
2 managed and can't be put in an interim storage-type  
3 situation.

4 And so, again, I backtracked to what if  
5 this jurisdiction where this event happened doesn't  
6 have availability to dispose? That is an example of a  
7 unique waste stream. It has nothing to do with the  
8 constituents, but it should be something that is  
9 factored in as a contingency by NRC because if, God  
10 forbid an event like that should happen.

11 You guys are going to be the ones to ask,  
12 hey, what are we going to do with this? And you  
13 aren't going to have the option to delay that  
14 decision. It is going to have to be you're going to  
15 have to gin up the numbers quickly. I think it's  
16 manageable, but I just wanted to point out policy  
17 versus regulation and the --

18 FACILITATOR CAMERON: Yes.

19 MR. YEAGER: -- and the complications that  
20 could arise.

21 FACILITATOR CAMERON: You are giving us a  
22 different ways, different lens to look at this idea of  
23 uniqueness besides concentration, so very good  
24 comment.

25 Arjun?

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. MAKHIJANI: Yes. I think there seems  
2 to be a lot of agreement that the NRC not try to make  
3 a list of unique waste streams as part of this  
4 process. I mean, that was suggested as one possible  
5 option, but that doesn't seem to be a good course to  
6 follow.

7 Obviously a lot of unique situations,  
8 specific ad hoc situations, are being managed as they  
9 come up, as Mark just said. And you do have to deal  
10 with that.

11 The bottom line in all of those  
12 situations, I presume, is that you are confident that  
13 the requirements of subpart C are being fulfilled  
14 because if they are not being fulfilled, you are not  
15 disposing of the stuff legally. And usually you are  
16 disposing of small amounts of stuff, whether they are  
17 dispersed in large volumes or whether it is a small  
18 amount of radioactivity that you are packaging, like  
19 the strontium-90 waste source that Mike talked about.

20 So I would simply say that at this point,  
21 that if you simply reaffirm subpart C, at the risk of  
22 sounding like a broken record, this other problem  
23 would simply go away. The licensees and the agreement  
24 states and so on all have the burden of considering  
25 these ad hoc situations but with the caution that

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 certain kinds of waste streams that may be coming down  
2 the pike, you can't throw it into the existing mix.

3 The recovered uranium from reprocessing  
4 would be an example. You have got a significant  
5 quantity of uranium that is now contaminated with  
6 technetium and plutonium and neptunium. And if you  
7 throw that into the mix as waste, then you're again  
8 beyond what was considered in the original regulation.

9 The kinds of things that are being done  
10 today generally without being familiar with all of the  
11 details, what I presume pass through the subpart C  
12 screen and will generally be within the spirit of what  
13 was done in the EIS back then. So tables 1 and 2 are  
14 pretty limited, but there is a spirit of how the waste  
15 was classified that I think subpart C talks to.

16 So, with Diane's caution that if you  
17 generally kind of stay within the idea of it, you are  
18 not pushing the institutional control limit with new  
19 waste streams, I would be happy with not going there  
20 in this, bumping it to the next process, as Bill  
21 suggested, I think.

22 FACILITATOR CAMERON: Yes. And many  
23 others have suggested.

24 MR. MAKHIJANI: And Felix.

25 FACILITATOR CAMERON: Thank you, Arjun.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 Larry, do you want to? Bill, why don't  
2 you just say what you have to say? And then I want to  
3 hear from Larry, who can react to all of this and give  
4 us his ideas. Bill?

5 MR. DORNSIFE: If NRC does do this what I  
6 would call a screening process to take a look at these  
7 other waste streams that are similar to DU and make  
8 sure that there are no hidden issues, which I do think  
9 you need to do to assure yourself there are no other  
10 unique waste streams, you probably ought to also look  
11 at the exempt waste streams that have the same  
12 characteristics, just to be sure that that exemption  
13 does not create a problem for you. You know, for  
14 example, there are some pretty high concentration  
15 thorium exempt waste streams that could find their way  
16 into disposal.

17 Based on Christine's comment, since they  
18 are not encumbered by NRC, I would be curious of  
19 whether any of their site-specific analyses have  
20 determined that pure DU is an acceptable waste stream  
21 for disposal in shallow land burial and if so, how hey  
22 dealt with the issues we have been struggling with.

23 FACILITATOR CAMERON: Do you want to  
24 answer that right now or do you want to confer before  
25 you answer it and let Larry go?

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MS. GELLES: I am going to simply say that  
2 while we have disposed of some pure DU, we would have  
3 to go back and look at what the results of the  
4 performance assessment runs were.

5 MR. DORNSIFE: I think your experience  
6 there I think would be very helpful in terms of what  
7 we are discussing. You know, how did you deal with  
8 the long-term issues of in-growth and --

9 MS. GELLES: We look forward to working  
10 with Larry and his staff. And if you want to craft  
11 some very specific questions, we will be happy to  
12 provide some of our modeling history for you.

13 FACILITATOR CAMERON: Great. Thank you.

14 Larry?

15 MR. CAMPER: Thank you, Chip. Thanks,  
16 everyone. I want to thank aloud with you from a  
17 process standpoint. I have found the comments on this  
18 particular issue of a unique waste stream and trying  
19 to define a unique waste stream to be intriguing and  
20 interesting, indeed.

21 When we were wrestling with this concept  
22 of a unique waste stream when we were preparing the  
23 SECY and talking about large quantities of depleted  
24 uranium, I think it's fair to say that the staff was  
25 perhaps being clever and proactive in looking back at

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 what occurred when part 61 was put in place years ago  
2 and this issue of large quantities of depleted  
3 uranium. And depleted uranium ended up by default in  
4 class A.

5 So we are trying to be proactive at this  
6 stage of the game since we are engaged in a  
7 rulemaking. Can we prevent that from happening again,  
8 at least within the realm of knowledge that we can get  
9 our hands around?

10 I think what I am hearing is that this  
11 notion of trying to define a unique waste stream,  
12 whatever that is, is indeed problematic.

13 Now, having said that, when we go back and  
14 communicate with the Commission in the future as we  
15 proceed with this rulemaking, we are going to need to  
16 say something about this concept called unique waste  
17 stream.

18 I was listening to your comments. I was  
19 struck by something that the Commission said again  
20 during the LES proceedings. Here is what the  
21 Commission said in order CLI-05-05, blah blah blah.  
22 The Commission stated, "Indeed, when part 61 was  
23 issued, its environmental impact statement explicitly  
24 acknowledged that the NRC might receive license  
25 applications involving disposal of low-level

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 radioactive waste requiring either an enhanced  
2 near-surface disposal method or intermediate land  
3 disposal methods. It was and remains the NRC's intent  
4 to retain flexibility to be able to address these  
5 license applications in the existing framework of part  
6 61 rule. And in the end, the bottom line for disposal  
7 of low-level radioactive waste is the performance  
8 objectives of 10 CFR subpart C." I think we all know  
9 what they are.

10 "Thus, while there may not yet be detailed  
11 technical criteria established for all of the kinds of  
12 land disposal that might be proposed under Part 61,  
13 criteria can be developed on a case-by-case basis as  
14 needed.

15 "Specific disposal requirements for more  
16 stringent land disposal methods, therefore, were left  
17 to be addressed in action on a specific application,  
18 subsequent guidance, and rulemaking effort if  
19 rulemaking is warranted."

20 Does that sound like a reasonable thing to  
21 go back and say to the Commission, given what I have  
22 heard here today about how difficult it is to define a  
23 unique waste stream, I mean, Commission, on this  
24 issue, you have previously stated that this really  
25 does need to be developed on a case-by-case basis up

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 to and including rulemaking if so indicated. Is that  
2 a reasonable response?

3 FACILITATOR CAMERON: Let's start with  
4 Mike. I think that we need to ask whether some of the  
5 suggestions we have heard around the table are the  
6 same thing as what you read. Mike had a comment that  
7 he was going to make before. Mike, if you could try  
8 to answer Larry's.

9 MR. RYAN: As I said, Larry, I think this  
10 is from my recollection, the first one where we have  
11 kind of been in this unique category. So I would say  
12 it is not broken, you don't need to fix it. It is  
13 that simple to me.

14 The other part of this that is a dimension  
15 that we haven't talked about, I'm going to take you  
16 from depleted uranium all the way to the other side of  
17 the spectrum, which is stellite balls for nuclear  
18 power plants, which are very radioactive with  
19 cobalt-60. And they are much greater than class C.

20 Now, if you do a performance assessment on  
21 all of the stellite balls in the country, in just  
22 about any disposal setting, there is no risk. So I  
23 would dial out to the unique waste form that had  
24 dropped off the truck in years ago by.

25 There is no reason by stellite balls are

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 not low-level waste except operationally, in handling  
2 them, transporting them, getting them to the disposal  
3 site, offloading them and disposing them and covering  
4 them up. There are some additional issues to address  
5 because of the high external radiation dose rates dose  
6 rates.

7 From a performance assessment point of  
8 view, they are of no consequence, mainly it's a  
9 five-year half-life and the cobalt form they are in is  
10 insoluble in water.

11 So if we are going to talk about gathering  
12 in all of these odds and ends that are important to  
13 address with a methodology, let's don't forget that  
14 side of the spectrum.

15 The other dimension is that these sources  
16 are important, there is a lot more interest in sealed  
17 sources because of security issues these days. So  
18 maybe that's a thing we should dial out and look at  
19 because I know states -- Mark's comments are  
20 well-taken and others, they collect them up. And then  
21 there is a national program to collect them, but it is  
22 a big deal. Many of them, in fact, could probably  
23 qualify as low-level waste.

24 Again, I emphasize the disposal risk is  
25 not the concentration in the source. It is the total

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 amount disposed and the results of the performance  
2 assessment of that inventory.

3 FACILITATOR CAMERON: Okay.

4 MR. RYAN: I just wanted to get that in  
5 David's list of things to consider to dial it out the  
6 other way.

7 FACILITATOR CAMERON: Just for the record,  
8 you used the phrase "dropping off the truck" in a --

9 MR. RYAN: Yes, in a symbolic kind of way.

10 FACILITATOR CAMERON: -- not in a real --

11 MR. RYAN: Not a real drop off a real  
12 truck.

13 FACILITATOR CAMERON: Those things didn't  
14 drop off the truck somewhere?

15 MR. RYAN: Yes.

16 FACILITATOR CAMERON: Okay.

17 MR. RYAN: Thanks for that clarification,  
18 Chip.

19 FACILITATOR CAMERON: Yes. Tom?

20 MR. MAGETTE: I think the answer to your  
21 question, Larry, is yes, that would be a very good way  
22 to go back to the Commission. I think it was a really  
23 good idea to put it on the table to say, maybe this  
24 isn't the only one. Let's define how we might capture  
25 future cases we haven't thought of so we don't have to

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 come back to a rulemaking.

2 And upon further reflection, it's maybe  
3 not something that is feasible. That is my view. I  
4 really don't think it is, but I think you have a good  
5 answer for the Commission, notwithstanding.

6 FACILITATOR CAMERON: Okay. Thanks, Tom,  
7 very direct.

8 Mark and then Arjun and Bill.

9 MR. YEAGER: I just wanted to follow up on  
10 Mike's comment about the stellite balls, for example.

11 And we have seen this as the life of the site ended.

12 And a lot of people were trying to get -- as long as  
13 we had access to Barnwell, let's go ahead and get  
14 these sources out of here. So we had a tremendous  
15 amount of sealed sources with tremendous amounts of  
16 concentrated radioactivity in them.

17 And, just like Mike said, as far as a  
18 performance standpoint, it is moot because they are  
19 going to be decayed within an institutional control  
20 period.

21 The issue that I have as a regulator,  
22 getting it from point A to point B has been such a --  
23 I look at it from the regulator standpoint and trying  
24 to make sure that it is transported safely within  
25 those limits that DOT specifies.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1           You can't imagine how much elemental lead  
2 and depleted uranium are used to try to get it from  
3 point A to point B. And then ultimately it goes in  
4 the ground just for that one little trip for that  
5 compliance. And it adds to a different component  
6 completely in that disposal facility.

7           I don't know if it's -- maybe it is  
8 something that NRC should think about in terms of  
9 maybe packaging and maybe working in conjunction with  
10 DOT to try to come up with another generation of  
11 transport vehicles to where we can have some type of  
12 variation of a Type B cask that can provide that  
13 shielding and maybe safely protect the site workers  
14 for a transfer into the ground of this material  
15 without leaving that material behind for such a short  
16 function, you know, just such a short function.

17           It is a shame that that has to happen  
18 because I do think there are legitimate ways to  
19 engineer and work your way around this without leaving  
20 it behind. You know, we should recycle it. I mean,  
21 these shieldings can be used over and over and over  
22 again. It can be cleaned up.

23           So it is just something else to consider  
24 because it really became -- you know, we even  
25 discussed it, Richard and I. You know, we all

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 discussed it as the end of Barnwell approached and we  
2 were getting the submittals. And it was completely  
3 within the regulatory framework, perfectly acceptable.

4 But I just had a real hard time. There's just a  
5 short amount of time from point A to point B and the  
6 impact, the long-term impact.

7 FACILITATOR CAMERON: Thank you, Mark.

8 And, Christine, before we go to Arjun, did  
9 you just want to comment on it?

10 MS. GELLES: No.

11 FACILITATOR CAMERON: Okay. Let's go to  
12 Arjun.

13 MR. MAKHIJANI: A couple of quick things.

14 Just as a factual matter, the less than five-year  
15 radionuclides and cobalt-60 have no upper limit for  
16 classes B and C in part 61. So currently they are not  
17 limited. They are limited by these practical  
18 considerations that Mark talked about.

19 MR. YEAGER: Just the dose rate.

20 MR. MAKHIJANI: Yes, that's right and the  
21 transport and how you package it and so on. But there  
22 is no concentration limit for cobalt-60 in part 61,  
23 parts B and C. So that question doesn't arise.

24 MR. RYAN: There is to some of the other  
25 radionuclides in the stellite, though.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. MAKHIJANI: Yes, yes. Well, for  
2 cobalt-60, there isn't. And for tritium, there isn't.

3 The practical thing in CLI-05-05 is that  
4 the Commission affirmed in that that subpart C limits  
5 are the things that govern. Whether you are at a deep  
6 disposal for greater than class C or shallow disposal  
7 doesn't really matter because of performance  
8 objectives.

9 That is what essentially I'm saying is you  
10 have got a regulation. You are going to a process  
11 that is risk-informed. All right. We will revisit  
12 all of these things.

13 But for now if you affirm what is in  
14 subpart C in the institutional control requirements,  
15 you know, the parts of the regulation that are not on  
16 the table, it will simplify things and be in the  
17 spirit of what you just read out from CLI-05-05.

18 FACILITATOR CAMERON: Okay. Thank you,  
19 Arjun.

20 Let's go to Bill and Christine and Diane,  
21 then to the audience. And then we will break for  
22 lunch.

23 MR. DORNSIFE: First, a facetious comment.  
24 I mean, we could just put all of these problem  
25 high-activity waste streams in a DU container, which

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 is exempt form a shielding standpoint, and dispose of  
2 the whole thing.

3 FACILITATOR CAMERON: See, people don't  
4 know when you are being facetious.

5 (Laughter.)

6 FACILITATOR CAMERON: So it is good that  
7 you have sort of labeled that. You labeled it in  
8 advance.

9 MR. DORNIFE: In terms of the question  
10 that is on the table, I would have absolutely no  
11 problem with the NRC staff going back to the  
12 Commission and saying, "Hey, site-specific analysis,  
13 that's all you need to do for any waste stream."

14 My concern, though, is how you ensure  
15 there is a level playing field from a competition  
16 standpoint, meaning you are likely to get -- well,  
17 first of all, you have the issue that I mentioned  
18 earlier of do, in fact, all of the sites meet the part  
19 61 technical requirements?

20 And, secondly, you know, the way an  
21 agreement state might implement performance assessment  
22 requirements, are you going to get a widely different  
23 answer in terms of how much DU could be disposed of?

24 FACILITATOR CAMERON: Okay. Thanks, Bill.  
25 Christine?

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 MS. GELLES: Thanks. And it's really a  
2 question, a clarifying question, for Larry.

3 I don't have a copy of the SRM in front of  
4 me, but I don't recall a specific assignment from the  
5 Commission to do anything with unique waste streams  
6 that wasn't directly tied to the question of  
7 developing this limited rulemaking for a site-specific  
8 performance assessment for unique waste streams,  
9 including DU. Did they ask you? And there may well  
10 be one. I just don't recall.

11 So my question was, I just wanted to make  
12 sure if you went back with the answer that you asked  
13 the group to respond to, that doesn't obviate the  
14 planned limited rulemaking to do a site-specific  
15 performance assessment, right? I am just kind of  
16 confused about what question you are trying to answer.

17 FACILITATOR CAMERON: Okay. But, you  
18 know, the --

19 MR. CAMPER: I don't have the SRM in front  
20 of me. So I have to be cautioned how I answer your  
21 question.

22 Clearly we did talk about this unique  
23 waste stream concept in the SECY. I don't remember if  
24 they word "unique waste stream" in the SRM or not. We  
25 will have to find that. So reserve the right. Do you

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 have that? Yes. Priya, thank you. Priya is always  
2 there when we need her.

3 In the SRM, it says -- yes. Here we go.  
4 In the SRM, it says, "As an initial approach to  
5 addressing the complicated issue, the Commission has  
6 approved the staff's recommended option 2 to proceed  
7 with rulemaking in 10 CFR part 61 to specify a  
8 requirement for a site-specific analysis for the  
9 disposal of large quantities of depleted uranium and  
10 the technical requirements for such an analysis."

11 We sought clarification from the  
12 Commission staff. And they intended for that to also  
13 capture unique waste streams. But they did not choose  
14 to modify the SRM following that inquiry.

15 MS. GELLES: And they specifically asked  
16 you to identify --

17 MR. CAMPER: Well, we talked about it. We  
18 talked in the SECY about the need to address this  
19 question of unique waste stream. And, as I said a  
20 moment ago, what was on our mind, really, was if we  
21 are going to proceed with a rulemaking, let's take  
22 this opportunity to perhaps not repeat what took place  
23 in 1979-1980 and no criticism intended toward those  
24 folks. They did a very fine job. But let's learn  
25 from that.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 My point in listening to all of this was I  
2 am hearing this august group say this thing of trying  
3 to identify what is a unique waste stream raises as  
4 many problems as it does answers.

5 My point in listening to all of this was I  
6 thought, well, maybe the thing to do is go back to the  
7 Commission and repeat what the Commission said in the  
8 hearing citation that I had pointed out. And that is  
9 part C, performance objectives, case-by-case basis, up  
10 to and including rulemaking if needed.

11 And maybe that is the answer of this  
12 dilemma of trying to identify what is a unique waste  
13 stream. And I was trying to pulse you guys to see  
14 what you thought.

15 MS. GELLES: And I had the same reaction,  
16 I believe, that Tom and Bill have. I would just offer  
17 that perhaps you would consider explicitly stating  
18 that "By virtue of the limited rulemaking that will  
19 establish a site-specific performance assessment  
20 framework for evaluating DU," that same framework can  
21 be used to assess any other waste stream that hadn't  
22 previously been analyzed as being acceptable at that  
23 site.

24 So I think the answer is this limited  
25 rulemaking is going to be responsive and solve any

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 unanswerd questions about unique waste streams  
2 without you necessarily having to define what is a  
3 unique waste stream or establishing a separate process  
4 for addressing them.

5 FACILITATOR CAMERON: Thanks. Thanks for  
6 adding that, Christine.

7 Diane? And then we will go.

8 MS. D'ARRIGO: I understand that 10 CFR  
9 61.55 is not in subpart C. I just wanted to say that  
10 our position would be not to reaffirm the class A, B,  
11 C classifications as they are now. I think that that  
12 is problematic.

13 Arjun was talking about reaffirming part  
14 C. I wanted to affirm that we still have concerns  
15 with the A, B, C classification as it is. So it's  
16 maybe confusing, rather than clarifying, but that is  
17 what I am trying to share.

18 FACILITATOR CAMERON: Okay. Thanks,  
19 Diane.

20 We are going to look at the long-term  
21 classification rulemaking later on. So talk about  
22 that. Audience? John? Please introduce yourself.

23 MR. GREEVES: John Greeves, Talisman  
24 International.

25 Dave started this with looking for a

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 simple, crisp answer. I think you have found it  
2 around the table. The primary criteria are the  
3 performance objectives. They trump everything else.

4 There are a number of examples where the  
5 staff and, in fact, DOE have used those performance  
6 objectives wisely and they didn't need a rule change  
7 to do that.

8 The staff, for example -- we can go back  
9 and look at the Trojan reactor vessel. That was done  
10 without a rule change. The staff very recently has a  
11 large body of evidence having done two waste  
12 determinations without a rule change.

13 What they did do was they had to look at a  
14 period of performance. And what they did do was look  
15 at 500-millirem as a limit for an intruder.

16 The department does this regularly. As an  
17 aside, are we bold enough to suggest that maybe at a  
18 future meeting, the department should come and give a  
19 little cameo discussion of how they do the special  
20 analysis. They have performance assessments up  
21 running at all times for their disposal sites.

22 Recently I worked on a project that got a  
23 special analysis required. It took them two weeks to  
24 come up with the answer. Why were they able to get  
25 that answer in two weeks? Because they had a

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 performance assessment up running, available, and they  
2 had a process and a protocol to do that. I think it  
3 would be very helpful for a future meeting to have  
4 that process protocol presented. I just suggest that.

5 But, full circle, lots of discussion about  
6 the performance objectives. My individual view is the  
7 performance objectives already do what is needed,  
8 though. Some are not interpreting that way. They  
9 need to be maybe perfected to include a period of  
10 performance and intruder limits, which, frankly, the  
11 staff in actually implementing in waste determination  
12 analyses. If they were in there, I think you would  
13 have what you need.

14 Sorry to be windy about that, but --

15 FACILITATOR CAMERON: Thank you very much,  
16 John.

17 Anybody else in the audience?

18 (No response.)

19 FACILITATOR CAMERON: Okay. Larry, you  
20 had an answer for a question that --

21 MR. CAMPER: Well, I have an answer, but  
22 --

23 FACILITATOR CAMERON: -- or maybe not an  
24 answer.

25 MR. CAMPER: In keeping with Tom's point

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 about our natural gas behavior filling voids, in this  
2 case, it will be an information void, Tom. I have an  
3 answer, but I will tell you before I give you the  
4 answer that the answer raises as many questions as it  
5 does provide an answer.

6 I think it was Bill and/or Diane earlier  
7 this morning answering this question in so any words  
8 about a state passing a moratorium, banning a disposal  
9 of a certain waste stream.

10 We did talk with the Office of General  
11 Counsel. If a state were to pass a moratorium banning  
12 a disposal of a certain waste stream across the board,  
13 that raises the compatibility issue.

14 Now, what does that mean? I don't know.  
15 That isn't what I am saying. I am raising as many  
16 questions as it does provide answers. But a blanket  
17 moratorium of a waste class does raise a compatibility  
18 issue. However, a state can do that on a  
19 site-by-site-specific license basis and, in fact, has  
20 done that.

21 So that is an answer to the question that  
22 was raised, but, as I say, when you start talking  
23 about it raises a compatibility issue, one can  
24 envision a litany of other questions that would follow  
25 on the heels of that.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MS. D'ARRIGO: Where has it been done?

2 MR. CAMPER: I beg your pardon?

3 MS. D'ARRIGO: Where has it been done?

4 MR. CAMPER: Where has it been done?

5 State of Utah has permitted class B and class C waste,  
6 although the license was withdrawn.

7 MR. DORNSIFE: What was your reaction to  
8 our license --

9 MR. CAMPER: As I say, this raises as many  
10 questions as it does answers. We have never pursued  
11 this issue of a compatibility problem. But you asked  
12 the question about a state providing a moratorium  
13 banning a class of waste. And the Office of General  
14 Counsel's view is that raises a compatibility issue.

15 Now, what does that mean? And how would  
16 that play out? And what are the mechanics? And what  
17 other questions does it raise? I can't answer them at  
18 this moment, but that's why I said before I answer  
19 this, it raises as many questions as it answers.

20 FACILITATOR CAMERON: Thank you. And  
21 thank our colleagues from the Office of General  
22 Counsel on this.

23 We are going to go to compatibility when  
24 we come back. There has been a number of issues  
25 raised about that. So if we need to revisit this

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 issue, then we will do that.

2 How about 1:25? That is a strange time.

3 Okay. I know you need that certainty. 1:30. 1:30.

4 (Whereupon, a luncheon recess was taken at  
5 12:19 p.m.)

6 FACILITATOR CAMERON: On the record.  
7 Okay, everybody. Welcome back and if any of you who  
8 have come in have not filled out a card that's out at  
9 the desk Gregory Suber has them right here. If you  
10 could just fill that out, then that will allow us to  
11 get information to you. You don't have to fill it  
12 out, but if you do it will allow us to get information  
13 to you about this subject.

14 We're going to go to a very, I think,  
15 unique and successful part of the NRC program which is  
16 the Agreement State program and we have Duncan White  
17 with us to tee it up and it will be a little bit  
18 longer than the usual tee-up so that he can explain  
19 some of the parameters of the program and how the NRC  
20 works with the states.

21 Duncan, are you ready to do this? He's  
22 not ready, but he'll do it anyway. Okay. Thanks,  
23 Duncan.

24 MR. WHITE: Good afternoon, everybody.  
25 Again, I'm Duncan White. I'm the Branch Chief for the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 Agreement State Programs Branch in the Division of  
2 Material, Safety and State Agreements and part of  
3 FSME.

4 I'm going to talk about compatibility of  
5 agreement states and NRC regulations. As Larry  
6 pointed out before lunch, compatibility is a complex  
7 issue and just in the 10 or 15 minutes I'm going to  
8 talk I'll hopefully give you a little flavor of it and  
9 it will hopefully open the discuss up.

10 Before we talk about compatibility  
11 specifically and the role it plays with agreement  
12 states and NRC regulations, I wanted to provide some  
13 background on compatibility in the NRC's Agreement  
14 State Program. The Agreement State Program has been  
15 around for about 50 years. This is not new. Congress  
16 passed Section 274 of the Atomic Energy Act in  
17 response to the states' interest in radiation  
18 protection and provided a mechanism to return certain  
19 classes of radioactive materials back to the states.

20 So what is an agreement state? On the  
21 surface, it's just a formal agreement between the  
22 governor and the NRC chairman in which the NRC  
23 discontinues certain authorities and the state assumes  
24 the regulation of certain classes of radioactive  
25 materials within its borders. The authorities assumed

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 by the state normally include the regulation of  
2 byproduct, source and special nuclear material that's  
3 in a critical mass. It may also include the authority  
4 to regulate the evaluation of sealed sources and  
5 devices, low-level waste disposal and uranium  
6 recovery.

7 States have become agreement states for a  
8 number of reasons. Recently, the assumption of NARM  
9 authority by the NRC under the Energy Policy Act of  
10 2005 was a driving force for Virginia and New Jersey  
11 to become agreement states. Really, a motivator for  
12 nearly all states to become agreement states is to  
13 bring the various facets of radiation protection into  
14 one program under one roof.

15 State regulation allows the state to  
16 exercise regulatory oversight tailored to their  
17 regional or local conditions. Also lower fees in the  
18 NRC and maintaining the funds locally are also a  
19 strong incentive.

20 Besides the distinction feature of  
21 discontinuing certain authorities instead of the  
22 typical Federal-state relationship of a delegated  
23 program, the Congress envisioned the agreement state  
24 program to promote an orderly, regulatory pattern and  
25 encourage the states and NRC to cooperate in the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 development of radiation protection standards.  
2 Although the NRC discontinues its regulatory authority  
3 in the agreement state, it does maintain an oversight  
4 responsibility to ensure that agreement states are  
5 adequate to protect public health and safety and  
6 compatible with NRC regulations.

7 Now I understand earlier in the workshop  
8 there was a question raised about what happens if  
9 states, and again germane to here, passes a moratorium  
10 to ban certain classes of low-level waste. That's  
11 again a very hard question to answer and there's no --  
12 Really I don't really have a good answer for that  
13 because it really depends on the circumstances of what  
14 that ban or moratorium is. And, without knowing the  
15 specific case circumstances, it would be not prudent  
16 to speculate anymore on that.

17 The keys elements of an agreement state  
18 program can be summarized into four broad areas.  
19 These areas also serve as the basis for the review of  
20 an agreement state application for a prospective  
21 agreement state: a licensing inspection and incident  
22 response program designed to adequately protect public  
23 health and safety in compatibility with the NRC  
24 regulations; a program that has sufficient staff and  
25 technical training to regulate the licensees under

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 their jurisdictions. Although the NRC does pay for  
2 training for inspectors and license reviewers, the  
3 state may need to hire an individuals with more  
4 specialized disciplines required for seal source and  
5 device, low-level waste and uranium recovery.

6 With the exception of NRC money for  
7 training, the states is required to fund their  
8 program. This is done with users' fees and for most  
9 states some allocations from general funds. And to  
10 maintain compatibility with NRC regulations, each  
11 agreement state needs enabling statutes and  
12 regulations consist with their state's administrative  
13 law.

14 Agreement States play a prominent role in  
15 the rad material in the United States. There are  
16 currently 36 Agreement States which regulate 85  
17 percent of the approximate 22,000 reactor material  
18 licenses in this country. New Jersey is on schedule  
19 to become the 37th Agreement State at the end of this  
20 month. As already mentioned in the workshop, the four  
21 licensed low-level waste sites are located all in  
22 Agreement States and the major waste processors in  
23 this country are also all located in Agreement States.

24 As indicated earlier, Congress requires  
25 the NRC to maintain oversight of the Agreement States.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 This is achieved through the Integrated Materials  
2 Performance Evaluation Program or IMPEP. The IMPEP is  
3 not only used to review Agreement States, but it's  
4 also used to review the NRC's Regional Materials  
5 Inspection and Licensing Program and the Headquarter  
6 Space, Sealed Source and Device Evaluation Program.  
7 IMPEP reviews the performance base and focused on  
8 outcomes. The reviews do not look at all activities  
9 of the program, but focus on those that have  
10 particular health and safety significance. If an  
11 Agreement State's performance is lacking in a  
12 particular area, the review will examine that aspect  
13 of the program and dig deep to determine what the root  
14 cause of that performance is.

15 The IMPEP reviews are performed at least  
16 every four years by a team of three to eight NRC and  
17 Agreement State technical staff. An onsite review is  
18 normally completed in a week but may also require  
19 additional review in the office or a longer time  
20 onsite.

21 The team will accompany state or NRC  
22 inspectors during the IMPEP in actual inspections of  
23 the licensees. The team will look at five common  
24 performance indicators for the state or region's  
25 Licensing, Inspection and Incident Allegation Program.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1       Additionally, Agreement States are reviewed for  
2 compatibility and for low-level waste, uranium  
3 recovery or sealed sources device if the state  
4 conducts those activities and has the authority.

5               The team's report is reviewed by senior  
6 management at the NRC and an Agreement State program  
7 director before the report's findings are finalized.  
8 This management review board is conducted at a public  
9 meeting held about three months after the end of the  
10 review.

11               The performance criteria used by the team  
12 to evaluate the state or the region's program is  
13 detailed in Management Directive 5.6. Management  
14 directives contain the policies and procedures that  
15 govern the internal NRC functions necessary for the  
16 agency to accomplish its regulatory mission. The  
17 IMPEP program also has a number of implementing  
18 procedures issued by our office that are designed to  
19 provide specific guidance to the team on individual  
20 indicators.

21               With that setup, now we can talk about  
22 compatibility a little bit. How is compatibility  
23 related to what we're talking about in this workshop?

24       As indicated earlier, Section 274 of the Atomic  
25 Energy Act requires the NRC to ensure that an orderly

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 regulatory pattern between the 36 Agreement States and  
2 the NRC be maintained with the NRC regulations serving  
3 as the benchmark for the compatibility requirements.  
4 These require that the regulations of any agreement  
5 state contain no gaps, conflicts or duplications with  
6 the other 36 different jurisdictions.

7           Compatibility does not mean that  
8 everyone's regulations are the same. It was the  
9 intent of Congress to allow Agreement States to have  
10 some flexibility in regulating radioactive material  
11 under their jurisdiction to accommodate local and  
12 regional concerns.

13           Compatibility not only relates to  
14 regulation but also to legally binding requirements  
15 such as license conditions and to program elements  
16 such as the program's implementing procedures. The  
17 process that the NRC uses to determine the  
18 compatibility of the regulation, legally binding  
19 requirements and programs elements are found in  
20 Management Directive 5.6.

21           So how do we apply this concept of  
22 compatibility? In the Management Directive, there is  
23 an evaluation process to determine the compatibility  
24 category for each section or even subsection of the  
25 NRC regulations that are required for agreement state

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 compatibility. There are six compatibility categories  
2 that can divide our discussion here into three groups.

3 For Categories A and B, the agreement  
4 state regulations must be essentially identical to the  
5 NRC's. This means essentially word for word. The  
6 basis for each category is different, but the result  
7 is the same. An example of a regulation that is  
8 Category A would be the basic dose limit of 5 rem per  
9 year as you find in Part 20. an example of Category B  
10 would be transportation regulations in Part 71.

11 For Category C, the Agreement State  
12 regulations must contain the essential objective of  
13 the section or subsection of the regulation. For  
14 category Health and Safety, the regulations must  
15 embody the essential objectives for health and safety.

16 For these compatibility categories, the agreement  
17 state can be more restrictive than the NRC.

18 This is an example here of Compatibility  
19 Category C, the many requirements in the regulations  
20 to perform a radiation survey. The NRC regulation may  
21 specify how that survey is done and how frequently it  
22 should be done. To meet the essential objectives, the  
23 agreement state regulation will also require the  
24 performance of a radiation survey. That's the  
25 essential objective. But the agreement state may

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 choose to require the survey to be done in a different  
2 manner than the NRC and at a more frequent interval.  
3 This is acceptable and the NRC will conclude that the  
4 state is compatible with regard to this requirement.

5 For the third category, these are the last  
6 two categories, Category D is not required for  
7 compatibility, but the Agreement States may choose to  
8 adopt the particular section of the regulations.  
9 Category NRC cannot be adopted by the agreement states  
10 since that authority has not been transferred to the  
11 state. An example of the Category NRC would be review  
12 and approval of Type B shipping containers you find in  
13 Part 71.

14 Here are some examples of compatibility  
15 categories for sections of Part 61. It's not uncommon  
16 for different sections or subsections of one part of  
17 the NRC regulations to contain different compatibility  
18 requirements. As you can see, the agreement states  
19 are required to have essentially identical regulations  
20 for 61.41 and 61.55 but have some flexibility to  
21 impose more restrictive requirements in 61.56.

22 During the workshop here, we were talking  
23 about the proposed inclusion of a waste classification  
24 specific to DU. When the NRC does propose such a new  
25 classification or if the NRC proposes a classification

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 for DU under 61.55 the compatibility category proposed  
2 by the NRC will in all likelihood be the same as it is  
3 now and that's Category B. If the final rule  
4 designates the compatibility category as B, then the  
5 Agreement States would have to adopt the same waste  
6 classification as the NRC.

7 So how does a performance assessment fit  
8 into compatibility? A performance assessment is  
9 performed to meet the dose requirements under 61.41 of  
10 the current structure and how the Agreement State  
11 performs the performance assessment will be part of  
12 the Agreement State's implementing procedures. The  
13 Agreement State's implementing procedures are part of  
14 what are referred to in an earlier slide as program  
15 elements.

16 The Agreement State's implementing  
17 procedures for low-level waste are considered  
18 Compatibility C. Again, the state has some  
19 flexibility in what they can use.

20 If the Agreement State has to adopt  
21 essentially identical regulations for the new DU  
22 classification since the NRC has determined it to be  
23 Compatibility B, how can the public input into the  
24 process? Yesterday, Andrew Carrera provided an  
25 overview of the NRC rulemaking process. The figure

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 here is similar to the one he showed yesterday, but  
2 emphasizes compatibility.

3 The Rulemaking Working Group makes the  
4 initial compatibility determination. During the  
5 internal review process, the proposed rule and  
6 compatibility determination are reviewed by a  
7 compatibility committee consisting of senior NRC and  
8 Agreement State staff to ensure consistent application  
9 of Management Directive 5.9 in the implementation of  
10 the rule.

11 After the public comments are reviewed and  
12 evaluated, NRC staff prepares the final rule with the  
13 compatibility designations. Before the final rule is  
14 published, the Commission will review its  
15 compatibility designations. The Commission has the  
16 final say on the rule's compatibility.

17 Agreement State normally have three years  
18 after the date the NRC implements their final rule to  
19 adopt compatible regulations. The Commission could  
20 require a shorter period of time for the Agreement  
21 States to adopt compatible regulations. In fact, they  
22 did this with the Waste Manifest Rule back in the  
23 1990s.

24 As you can see from the figure, once the  
25 NRC adopts the rule and the regulation is final, then

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 the Agreement State has to adopt the rule. There is  
2 really not much the Agreement State can do to change  
3 the language in the rule because of the compatibility  
4 or may not be able to change the language in the rule  
5 because of compatibility. The opportunity for  
6 greatest impact and influence on input on the  
7 compatibility designation comes when the NRC is  
8 promulgating their rules.

9 The NRC reviews the draft and final  
10 versions of all Agreement State regulations to ensure  
11 that they are compatible with the NRC regulations.  
12 This process is also applicable to proposed state  
13 statute changes that impact the Agreement State  
14 program. In addition to the review by the NRC  
15 technical staff, the NRC's Office of General Counsel  
16 also reviews each draft and final rule.

17 NRC staff prepares a written response to  
18 the Agreement State that is reviewed and signed by NRC  
19 management. The NRC review for each agreement state  
20 is tracked and is publicly available on FSME public  
21 website.

22 As I said, our compatibility process as  
23 well as impact on the rest of the policy and  
24 procedures that govern the Agreement State program are  
25 publicly available on the FSME public website and that

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 website is linked from our main website at nrc.gov.  
2 The regulation toolbox has a complete breakdown of all  
3 NRC regulations required for Agreement State  
4 compatibility.

5 That concludes my opening remarks and  
6 answer questions.

7 FACILITATOR CAMERON: Thank you, Duncan,  
8 and there may be more -- it's not only going to be  
9 questions obviously, but questions and discussion.  
10 There may be more questions about this part of the  
11 program. Let me ask if there are questions first  
12 before we go to discussion.

13 Bill.

14 MR. DORNSIFE: I guess I would ask. Does  
15 NRC ever conduct any audits like you require everybody  
16 else to do of how effectively these management  
17 directives are implemented?

18 MR. WHITE: Just recently, earlier this  
19 year, the IG, the NRC's IG, finished an audit of the  
20 Agreement State program itself, looked at various  
21 aspects of it and made some recommendations on how to  
22 propose changes, effective changes, we may want to  
23 look at. So the management directives are just  
24 periodically -- Specific questions about management  
25 directives.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. DORNSIFE: Well, I'm talking  
2 specifically whether compatibility requirements are  
3 uniformly enforced by all the states.

4 MR. WHITE: Compatibility is reviewed  
5 during IMPEP and that's one of the things that we do  
6 look at.

7 MR. DORNSIFE: But I'm talking more  
8 broadly, you know, look at one state versus another  
9 state and the same rules are always being applied the  
10 same way.

11 MR. WHITE: As I said in my remarks, rules  
12 may not necessarily be -- have a compatibility  
13 designation that allows the states to have some  
14 flexibility in how they adopt them and how they  
15 implement them. Again, they're not going to be all  
16 the same. We don't have -- Everyone doesn't have --  
17 There are 36 Agreement States and the NRC. All don't  
18 have the same regulation. There are variations  
19 between them. So you could go from one state to  
20 another. The same requirement. You may see some  
21 differences in them.

22 MR. DORNSIFE: No. I understand that.  
23 You know, my question is more -- Well, I'll give you  
24 an example. Even though you say that the waste  
25 classification system is Category B and I assume the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 nomenclature has changed over the years, but the  
2 concept has been there from day one. You allowed  
3 Pennsylvania to come up with Class C limits for  
4 thorium and uranium. Now, on the surface, that would  
5 say, "Gee. That's really going beyond what you're  
6 saying is applicable to this particular category."  
7 And I'm wondering out of that is there any management  
8 program, whether it be audit or anything, that  
9 periodically assesses how well you're implementing  
10 your policy.

11 FACILITATOR CAMERON: How are issues that  
12 come up where there might be a potential inconsistency  
13 between what one state is doing and another state is  
14 doing in regard to a particular topic? How are those  
15 issues raised and considered? Is there a mechanism  
16 just in the internal management of the program where  
17 issues like that might be checked? In other words,  
18 when you go out and do an IMPEP review, pretty  
19 comprehensive review, is it on your mind that we need  
20 to take a look at how the state is implementing this  
21 program not just for purposes of comparing it to the  
22 NRC requirements but in terms of how other states  
23 might be doing that? Does the Organization of  
24 Agreement States look at these types of issues?

25 I think Bill is trying to see how these

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 issues might be raised, Duncan.

2 MR. DORNSIFE: Well, just another  
3 clarification, Chip, and even more specific, let's say  
4 a licensee felt that because of the way an agreement  
5 state has been approved to do something that they're  
6 at an unfair competitive advantage. Is there a  
7 process to get some redress for that issue?

8 FACILITATOR CAMERON: How would an unnamed  
9 licensee approach the NRC on something like that,  
10 Duncan?

11 MR. WHITE: This can be done a couple  
12 different ways. One way, sometimes the licensee has  
13 approached us directly and indicate that they believe  
14 a certain practice in a certain agreement state is not  
15 consistent with our policies and we would look into  
16 that specifically. Sometimes these things are found,  
17 sometimes they're found, during IMPEP reviews where  
18 we've found some cases where how the state is either  
19 maybe not so much in regulations but certainly how  
20 they implement their statutes and procedures. There  
21 may be some way they're being inconsistent in that and  
22 during IMPEP we would address that and point that out  
23 to them.

24 It can be something as simple if they're  
25 licensing something they shouldn't be licensing or

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 they have a -- We have not looked at a regulation in a  
2 long time and they didn't submit it to us and we have  
3 to have them change it. I mean it could take various  
4 different forms. But it's been brought to our  
5 attention in many different ways.

6 MR. DORNSIFE: But you're somewhat -- I  
7 think you're somewhat limited in how you enforce your  
8 will upon the states. I mean if they say no, your  
9 only option is to pull the agreement and we know that  
10 probably isn't going to occur for most issues unless  
11 the --

12 (Off the record comment.)

13 FACILITATOR CAMERON: And, Duncan, another  
14 question that may allow you to comment on Bill's  
15 observation is that even when there is a compatibility  
16 level that requires something of the states and the  
17 regulations you still look at their entire program of  
18 implementation to see if that objective, overall  
19 objective, is being met. In other words, there is  
20 some judgment involved and, in the example Bill gave,  
21 there are discussions with the state over what can be  
22 done to remedy the situation. Is that correct?

23 MR. WHITE: Yes. Part of the IMPEP  
24 process we do. We could very well make  
25 recommendations and again effectively we ask them to

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 take action to change it and we do track those things.

2 Again, there's been cases where we've tracked  
3 recommendations through two or three IMPEP cycles to  
4 get them to fix a particular problem.

5 We had one particular state, for example,  
6 who had dose limits, equivalent to Part 20 of our  
7 regulations who had dose limits, which were not  
8 compatible with ours and we eventually kept on them  
9 until they changed them. Again, I don't know why they  
10 did that in the first place, but the discrepancy was  
11 discovered and we told them to fix it and we kept on  
12 them about it.

13 And again, part of that, sometimes part of  
14 that pressure comes from licensees, too. Licensees  
15 would look at the -- who have to comply with those  
16 regulations were smart enough to know and said, "Gee.

17 That's different from the NRC's and I know that has  
18 to be the same." And they may bring it our attention  
19 or we would say we would follow up on that. Again, we  
20 may do it through IMPEP. We may do it -- look at it  
21 separate as a performance concern, again, because we  
22 do the IMPEP only like about every four years unless  
23 the program has a number of performance issues which  
24 we would go back even more frequently.

25 FACILITATOR CAMERON: And, Bill, I know

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 you may have more and we'll come back to you. But  
2 let's hear from Felix and Diane and Arjun. Felix.

3 MR. KILLAR: I have two questions to make  
4 sure I understand the compatibility issue particularly  
5 with the Category C since that's the only one that's  
6 allowed to be more restrictive. Under EPA's rules for  
7 more restrictive compatibility, states have the  
8 ability to do that. However, they have to justify the  
9 reason why they feel that their regulation should be  
10 more restrictive than the EPA's.

11 The first question, does the NRC have any  
12 such similar requirement that if a state was to put in  
13 something that's more restrictive than the existing  
14 NRC regulations the state has to justify why they want  
15 to provide that more restrictive requirement.

16 MR. WHITE: No, there isn't.

17 MR. KILLAR: Okay. The second one which  
18 is related because I figured that was the answer to  
19 the first one, if a state does have a more restrictive  
20 requirement, does the NRC look at the basis of the  
21 more restrictive requirement for one purpose and that  
22 is to determine if the NRC regulation is maybe  
23 inadequate in that area and so that way they felt that  
24 the regulation should be brought up to where the state  
25 has determined or if they feel that the determination

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 of the state, the models, technology, whatever they  
2 did to come to that decision has something that  
3 they've identified that the NRC hasn't recognized.

4 Because I know, we deal with, I deal with  
5 a lot of source and Part 30 materials and we have a  
6 lot of issues, a lot of those, because of the  
7 inconsistencies between states. We'd like to see the  
8 NRC kind of help get some of the inconsistencies  
9 cleared out.

10 MR. WHITE: Yes. There have been a couple  
11 of instances where the agreement state may have  
12 implemented certain regulations and after a number of  
13 years we've actually changed ours because we've found  
14 out how the state is implementing theirs. We found  
15 out that it's equally protective of the public health  
16 and safety and again it allows existing state practice  
17 to continue and we will change ours. We necessarily  
18 change our regulation. Sometimes we would have to,  
19 but sometimes we may just change the compatibility to  
20 allow a little bit more flexibility for other states  
21 to do that and again it showing that there's a  
22 national program that's kept in place. But again, we  
23 have in case reacted to it that way.

24 FACILITATOR CAMERON: Great. Diane?

25 MS. D'ARRIGO: My question has to do with

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 I think transferability. When an agreement state  
2 licenses company, be they processors or transporters -  
3 - I think those would be the two that I'm thinking of  
4 -- the way I understand it is that once they get an  
5 agreement state license they can also operate in other  
6 states.

7 MR. WHITE: Yes. One of the requirements  
8 in the agreement is that the NRC and the other  
9 agreement states will recognize another agreement  
10 state's license. But the agreement state license they  
11 have to abide by the requirements of that agreement  
12 state license, again, if it's state law -- I'll just  
13 use this for example. There's a Pennsylvania licensee  
14 and they go to work in an NRC jurisdiction. They have  
15 to comply with the Pennsylvania requirements. They  
16 have to comply with the NRC requirements.

17 Also I should point out that the  
18 Pennsylvania license has to authorized licensees to  
19 work outside Pennsylvania. Usually it has temporary -  
20 - A license like that would have something called  
21 temporary job sites. It allows them, authorizes them,  
22 to work outside their home state.

23 MS. D'ARRIGO: Does the state then --  
24 Isn't the licensing the company, but the company is  
25 working in their -- Let's say you've got a Tennessee

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 company that's working in Maryland. Does Maryland  
2 need to be notified?

3 MR. WHITE: In almost all cases, yes.

4 MS. D'ARRIGO: That's required by NRC? I  
5 was trying to figure out where that --

6 MR. WHITE: Most states require that.

7 MS. D'ARRIGO: So Maryland would require  
8 notification of --

9 MR. WHITE: Maryland would require --

10 MS. D'ARRIGO: But it's -- Okay. It's up  
11 to the state in which the activity is taking place.

12 MR. WHITE: Yeah.

13 MS. D'ARRIGO: So let's say it's not even  
14 an agreement state. Let's say they were going into  
15 Indiana or -- I don't know. Who is not an agreement  
16 state?

17 MR. WHITE: That's NRC's jurisdiction.  
18 They would have to notify the NRC.

19 MS. D'ARRIGO: And they would have to let  
20 you know that I'm cleaning up this facility.

21 MR. WHITE: Yes.

22 MS. D'ARRIGO: Okay.

23 MR. WHITE: That's correct.

24 FACILITATOR CAMERON: And Arjun?

25 MR. MAKHIJANI: A question at this stage.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 Did the IG's audit find major deficiencies and, if  
2 so, what were they?

3 MR. WHITE: What audit found, the audit  
4 recommended doing another lessons -- We had done  
5 lessons learned in our program in about 2002. It  
6 recommended doing another one of those lessons learned  
7 which we're planning to do. It also recommended some  
8 changes to some of our procedures to make them more --  
9 to adapt them to some of the issues that have more  
10 recently come up.

11 Specifically, one of them was the pandemic  
12 and continued operations. Again, both of the NRC and  
13 all the states have pandemic-type plans or COOP-type  
14 plans and again IG was looking to see if there was  
15 more inaction and more cooperation between the two of  
16 them and that was another one of the major findings on  
17 that.

18 FACILITATOR CAMERON: And Tom?

19 MR. MAGETTE: Duncan, during your  
20 presentation, you discussed briefly the notion of a  
21 moratorium and how that's a challenging question and  
22 it would depend upon the specifics of the case as to  
23 what your interpretation would be. Could you give me  
24 some examples of either a real or for that matter just  
25 a hypothetical case where you would come in and say,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 "No, you can't do that" or where you conversing might  
2 come in and say -- I don't know what else you would  
3 say. If they're not consistent with the regs I'm not  
4 sure how you would say, "That's okay."

5 MR. WHITE: I mean that's a hard one, but  
6 one example I guess hypothetically would be that if  
7 the licensing authority required the operator of a  
8 site to do a performance assessment and they found  
9 they can't take any more of a particular type of waste  
10 in that site there because the performance dictated  
11 that the dose limits would, you know, raise to a  
12 certain level that would exceed the regulations. They  
13 may require them to and they may stop them from taking  
14 in that type of waste. That would be a reasonable  
15 thing to do. It effectively shuts off them bringing  
16 material in, but that's one possible thing where it  
17 might be acceptable.

18 MR. MAGETTE: But wouldn't you do the same  
19 thing? I don't see how that would be inconsistent  
20 with how the NRC rule in a similar case if you looked  
21 at a performance assessment and said, "Gee, you  
22 clearly exceed the dose limits in Subpart C." I mean,  
23 I'm looking for a case where you've got -- you're  
24 allowing something and an agreement state says, "Well,  
25 I'm going to do something different" which in theory

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 in accordance with the regulations would not be  
2 permissible. They would be at risk of losing their  
3 agreement state status one would presume and yet you  
4 said that it might not always be that end result. It  
5 would depend on the specifics. I'm having a hard time  
6 understanding what specific case would lead to it  
7 being okay if, in fact, it's not consistent with, for  
8 example, compatibility Category B. How do you get  
9 there from here?

10 MR. WHITE: Again, I showed the chart on  
11 my presentation where the 61.41, the requirements, is  
12 Category A. It has to be the same as the NRC. That  
13 again -- And under our current system to meet that you  
14 would easily do a performance assessment to show that  
15 you would not exceed that limit. You know, you would  
16 use certain modeling and certain of the site and it's  
17 very site-specific information to come up with that  
18 determination and that may be the basis for them to  
19 say, "No, we can't take anymore of this type of waste  
20 on the site" for example. That may be their basis for  
21 doing that.

22 MR. DORNSIFE: Just quickly, Tom, I think  
23 you have a very good example in the fact that Utah  
24 says you can't take B and C and your question will be  
25 authorized under the Waste Classification System and

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 NRC has found that okay.

2 FACILITATOR CAMERON: Is that a helpful  
3 example?

4 MR. MAGETTE: No.

5 (Laughter.)

6 No, I don't think it's necessarily  
7 relevant.

8 (Laughter.)

9 It's not like we have a license. We  
10 didn't apply for a license to take B and C waste, get  
11 one and then have Utah say, "We don't want you to take  
12 it after all."

13 MR. DORNSIFE: If you would apply, maybe  
14 they would give you one.

15 MR. MAGETTE: No, we applied and we  
16 withdrew it.

17 FACILITATOR CAMERON: Go ahead, Tom.  
18 Finish.

19 MR. MAGETTE: We withdrew that  
20 application. There was no application ever rejected  
21 and frankly we think if we were to submit it and it  
22 were to be reviewed that it would be found to be  
23 technically acceptable. But we haven't gone through  
24 that. We haven't done that. So that's why I don't  
25 think it's applicable. If they had said, "No, you

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 can't take B and C after all" and we're sitting there  
2 holding a license, I would think that would in fact be  
3 an example of something that wouldn't be allowed.

4 MR. WHITE: I think that's a good example.

5 I mean if you submit an application for B and C waste  
6 and that application was technically acceptable and  
7 the state decided not to accept it for nontechnical  
8 reasons, I mean one could argue possibly that creates  
9 a compatibility issue. Likewise, if there was a  
10 technical reason for not accepting it, that's a very  
11 different reason.

12 And they should put it out to people when  
13 they apply for -- As you pointed out, people apply for  
14 licenses. They apply to do certain activities and  
15 they will be authorized for certain activities. They  
16 don't get the whole kit and caboodle when they apply  
17 for a license. "Oh, we'll give you all this extra  
18 stuff, too." That doesn't happen that way and your  
19 example is a very good demonstration of that. You  
20 asked for Class A and they gave you Class A.

21 MR. MAGETTE: Right.

22 FACILITATOR CAMERON: Go ahead, Tom.

23 MR. MAGETTE: I was just also going to  
24 make a comment. I mean if you have a follow-on.

25 FACILITATOR CAMERON: Well, I just was

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 wondering, Duncan, if there's anything that could be  
2 helpful to Tom with that question, for example, from  
3 the two-person radiography rule where some states were  
4 implementing it differently than the NRC which they  
5 might not have had the discretion to do that. But  
6 they were achieving the objective, health and safety  
7 objective, of the regulation and the NRC because the  
8 NRC works with the agreement states as co-regulators  
9 basically that there's a lot of room for discussion  
10 and trying to understand what states are trying to do  
11 and eventually I think the NRC changed its rules to  
12 recognize that particular practice.

13 MR. WHITE: Right.

14 FACILITATOR CAMERON: Do you want to offer  
15 anything on that? I don't know if that's going to --  
16 It's a stark example for Tom.

17 MR. WHITE: Yes. But also I think points  
18 out the complexity of dealing with this. Again, when  
19 you talk about compatibility, it's easy to say, "It's  
20 Compatibility B and these are the rules." That's not  
21 necessarily the case.

22 Again, as I said, it's a partly -- This is  
23 why we get lawyers. This is why everything we do is  
24 reviewed by lawyers because we want to make sure that  
25 we, you know -- We do sometimes get cases where states

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 come in with something that's not black and white and  
2 we have to look at it carefully and decide that. And  
3 again in the case of Chip was talking about and that  
4 was the State of Texas, Texas in fact we had a  
5 different interpretation of the two-man rule than the  
6 State of Texas did and we had to come to some -- Once  
7 we decided that the Texas interpretation was equally  
8 as safe, then we accepted their approach to do that.

9 Again, the bottom line at the end of the  
10 day we're worried about health and safety and  
11 protecting people and, you know, we want to make sure  
12 that's what we're doing.

13 FACILITATOR CAMERON: Okay. Tom, do you  
14 have some more or should we go to Felix and Diane and  
15 come back?

16 MR. MAGETTE: I just want to make a  
17 comment.

18 FACILITATOR CAMERON: Go ahead.

19 MR. MAGETTE: And whatever order you want  
20 to go in is fine.

21 FACILITATOR CAMERON: Yes. Go ahead. No,  
22 do it please.

23 MR. MAGETTE: I mean I would like to  
24 comment on this topic in general that Bill's raised  
25 the question "Should there be a limit of some sort of

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 acceptable floor?"

2 "An oakey-dokey level" I think was the  
3 technical term he used or you used.

4 FACILITATOR CAMERON: No, he did. Please.

5 MR. MAGETTE: Okay. The ODL -- I'm not  
6 using the DM (de minimus) word. No Latin here. And  
7 without that that we have a complication that we have  
8 a problem that there will be some sort of interim  
9 state action over the course of this rulemaking.

10 My suggestion in response to that is I  
11 think that we might have that anyway. But my comment  
12 is that as I read your current regulations you're  
13 talking about a modification of 61.55 in this  
14 rulemaking which is compatibility Category B. I  
15 presume that a new 61.55(a)(9) would also be a  
16 compatibility Category B which is consistent with what  
17 you said about changing a portion of your regulations.

18 I've also suggested that an amendment to  
19 subpart C or 61.41 as a part of this process would be  
20 in order. That's a compatibility Category A and so  
21 that would not be a new section under a new paragraph.

22 So I think it would still clearly all be  
23 compatibility Category A.

24 It seems to me that there's not a lot of  
25 latitude for a state to do something different in a

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 case like this where the NRC is going through a  
2 rulemaking that is extensive where you've developed a  
3 lot of information, where you've created technical  
4 basis, where you're clearly looked at the existing  
5 Table 61.55 and said, "We're not changing the  
6 classification of depleted uranium." So there seems  
7 to be no basis for some other action by an agreement  
8 state in the interim and I think that's what I heard  
9 Larry say words to the effect of this morning that  
10 that classification has not changed.

11 And so if this is not a case where it  
12 would be clear that a state is not allowed any  
13 latitude to do something. I don't know what would be.

14 So that's my comment. If there certainly should be  
15 such a case where the continuation of current practice  
16 should be continued in the interim, the NRC clearly  
17 had the opportunity to suggest that that's not  
18 appropriate. But we have multiple documents, whether  
19 they be orders from the LES licensing case or the  
20 SECY-08-0147 or the SRM in this specific proceeding  
21 that the NRC has not taken that opportunity.

22 So I don't think it's reading too much  
23 into that to suggest that that's a proper  
24 interpretation. And that's my comment.

25 FACILITATOR CAMERON: And I think that

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 that's very clearly stated, too, Tom. And, Duncan, I  
2 guess one final question for you as maybe one  
3 observation is that the NRC has not too often been  
4 presented with a case like that.

5 MR. WHITE: I can't recall anything. One  
6 thing I wanted to comment on just because the  
7 compatibility designation for a section is as it is  
8 doesn't mean it always is that. It can change. If we  
9 do add stuff, we will look at the new addition fresh  
10 and determine if the compatibility category for that  
11 subsection is appropriate or not. If it isn't, we'll  
12 decide with something else.

13 And again we have numerous examples in our  
14 regulations where we have subsections of a particular  
15 part of the regulations have been different  
16 compatibility designations. So we would have to look  
17 at it again. It all depends on how the rule is  
18 written. Again, we can predetermine what that is  
19 until we see it, until we actually have language to  
20 look at.

21 FACILITATOR CAMERON: And one issue for  
22 all of you, I mean, when this proposed rule goes out  
23 there's going to be a proposed compatibility  
24 determination in there and people can comment on  
25 whether they think that's the correct determination.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 But it's also fair for people to comment that if this  
2 is the determination that it should be pretty black  
3 and white and should be enforced.

4 And you're giving us a comment on it now  
5 which is helpful. We haven't heard too many comments  
6 on in terms of this site-specific performance  
7 assessment, what people's opinions are on what level  
8 of compatibility and I guess that we don't need to get  
9 stuck trying to decipher A, B, public health and  
10 safety.

11 The question is really how much  
12 flexibility should a state have in deciding how the  
13 performance assessment is done or is it going to be  
14 more rigid than that in that it has to be uniform?

15 Let's go to Diane and Felix and Arjun.  
16 Diane.

17 MS. D'ARRIGO: This is a question about  
18 whether, let's see, an agreement state will, let's  
19 say, license facilities that can do things that the  
20 NRC wouldn't necessarily allow and I'm concerned. The  
21 thing I'm thinking about is Tennessee licensing  
22 processors that have the authority themselves to  
23 determine whether certain radioactive waste can then  
24 go into unregulated facilities.

25 And I know NRC does that on a case-by-case

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 basis and it seems to be more generic in Tennessee and  
2 we've been told that there are other states that are  
3 also doing this and I wanted to -- On the surface, it  
4 looks like the state is doing something that's more  
5 lax than what the NRC would do. I wanted to hear how  
6 that jives.

7 MR. WHITE: That's something we will  
8 certainly look at during an impact review. We look at  
9 how they were doing that and what their basis for  
10 doing it is. I can't say without knowing specifically  
11 what Tennessee does. I really can't say anything more  
12 right now about that aside for we would approach doing  
13 it.

14 FACILITATOR CAMERON: And it may be I know  
15 that Diane has a lot of questions about the Agreement  
16 State Program works that don't necessarily come into  
17 play in this particular rulemaking. But it may be  
18 helpful --

19 MS. D'ARRIGO: Will this rulemaking be a  
20 change in 10 CFR 61 perhaps or what do you -- what  
21 were the constraints of my questions here?

22 FACILITATOR CAMERON: No, I was just  
23 suggesting that obviously there's going to be a change  
24 in Part 61 somewhere. I just was thinking about your  
25 particular example about how that might apply to this

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 site-specific performance assessment and I'm not  
2 saying it's not a legitimate question. I was going to  
3 suggest that maybe some of the things that are outside  
4 of this site-specific performance assessment category  
5 --

6 MS. D'ARRIGO: The site-specific  
7 performance assessment for depleted uranium and unique  
8 waste going into a 10 CFR 61 facility?

9 FACILITATOR CAMERON: Basically. I'm just  
10 suggesting that Duncan may want to talk to you offline  
11 about perhaps a broad range of questions that you have  
12 about agreement states --

13 MS. D'ARRIGO: I thought other people here  
14 might also have some input on how that works on  
15 whether other states are doing similar things.

16 FACILITATOR CAMERON: Okay. Well, Duncan,  
17 I guess you've basically said that you didn't have --  
18 Do you want to repeat what you said?

19 MR. WHITE: Yes. Sure. That's easy. I  
20 think something like that we would look at during an  
21 impact review of the State of Tennessee, I mean, how  
22 they are doing that. Is this consistent with their  
23 procedures and with what the regulations are? That's  
24 what we would look at.

25 MS. D'ARRIGO: Well, I mean, with depleted

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 uranium, does NRC allow incineration of depleted  
2 uranium? I mean, we're talking about DU. So I'm just  
3 trying to figure out how the fact that they license  
4 the burning of depleted uranium and how that jives  
5 with NRC regs. Is that considered more restrictive or  
6 less restrictive?

7 FACILITATOR CAMERON: Did we -- Does the  
8 NRC allow the burning of depleted uranium?

9 MR. WHITE: I don't know.

10 MS. D'ARRIGO: What was it?

11 MR. WHITE: I don't know.

12 MR. ESH: I don't know yet.

13 MS. D'ARRIGO: You don't know if NRC would  
14 allow it.

15 FACILITATOR CAMERON: Because, yes, I mean  
16 certainly we must have an answer for that. Is the  
17 incineration of depleted uranium?

18 MR. ESH: I have no idea. Sorry.

19 FACILITATOR CAMERON: Dave, we're not  
20 getting this on the -- You're going to have to come to  
21 the microphone.

22 Diane, is this based on --

23 MS. D'ARRIGO: Well, this is the depleted  
24 uranium meeting. I have some knowledge of depleted  
25 uranium issues in that state which I've questioned

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 whether they are more lax, less lax, how that  
2 particular amendment that the state gives, how that --  
3 Is that stricter than Federal? Is it consistent with  
4 Federal?

5 FACILITATOR CAMERON: So is Tennessee  
6 allowing the incineration of depleted uranium?

7 MS. D'ARRIGO: Yes, at Aerojet.

8 FACILITATOR CAMERON: Okay. Larry.

9 MR. CAMPER: I would suggest that what we  
10 do, Diane, is talk with you separately about this and  
11 get the facts and examine it and so forth to be able  
12 to give you a more thorough answer at the moment. I'm  
13 not sure we're prepared to answer the question at the  
14 moment.

15 FACILITATOR CAMERON: Okay.

16 MS. D'ARRIGO: Okay. Well, it fits into -  
17 - it's sort of blurry as to when you've got  
18 compatibility whether a state is doing something that  
19 is stricter than Federal, less strict than Federal,  
20 and I guess I've sat in on IMPEP reviews and they  
21 don't always cover the things that I would cover. So  
22 I'm not sure how to intersect with that.

23 FACILITATOR CAMERON: I think maybe the  
24 description of blurry is probably a good description  
25 unfortunately or as the case may be.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 Felix and then we'll go to Arjun and,  
2 Michael, you have a comment down there, too.

3 MR. RYAN: Yes, sure. When you're ready.

4 FACILITATOR CAMERON: Okay. Then Felix,  
5 Arjun and Michael.

6 MR. KILLAR: Okay. I want to go back a  
7 little bit to part of the questioning and  
8 clarification that Tom and Bill were talking about and  
9 that is that when a state's decisions on low-level  
10 waste disposal start changing the playing fields for  
11 disposal of low-level waste, does that then become a  
12 compatibility issue or not?

13 MR. WHITE: It may, but again I don't know  
14 the specific circumstances. Again, one of the -- I  
15 mean things that I'm not very knowledgeable of. I  
16 know it what effects it is, you know, compacts. I  
17 mean that is an invasion at the time. You know,  
18 agreement states were -- The Congress passed a law. I  
19 really don't -- So it's a hard question to answer.

20 MR. KILLAR: Okay. Let me give you two  
21 things to think about. In the DOT rates, for  
22 instance, interstate transportation of radioactive  
23 materials is generally allowed across state borders  
24 provided that the regulations are uniformly applied.  
25 However, if the state implements some regulations that

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 are more restrictive such that the transportation ends  
2 up having to go around the state rather than trying to  
3 abide by that regulation then there is an ability to  
4 challenge that regulation as being adverse to  
5 interstate commerce and DOT will step in and they'll  
6 make a determination of what the intent was for that  
7 regulation. Is it not in the spirit of the interstate  
8 commerce provisions and is it doing a frivolous thing  
9 for the purpose of protecting that state from  
10 transportation of radioactive materials through that  
11 state?

12 I would think that we're looking at  
13 something similar here and the example I like to give  
14 is the example from a number of years ago. In the  
15 Central States Compact Commission, Nebraska was  
16 elected to be the disposal site for the Compact  
17 Commission. Nebraska initially indicated that they  
18 would accept that opportunity and a number of  
19 activities were ongoing and licensing and  
20 characterization and licensing of the site as well as  
21 a way to be a final site for final license for --  
22 There was a change of administration of the state and  
23 the governor decided that he didn't want that in his  
24 state and as a result of that change in the  
25 requirement, what have you, to make it basically stop

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 the whole process and stopped the development of that  
2 disposal facility in that state.

3 Now what's he done is he actually is going  
4 beyond the capability requirements which you  
5 authorized him to do. But as a result of that,  
6 basically took away a low-level waste disposal  
7 facility.

8 FACILITATOR CAMERON: But there's no -- Go  
9 ahead, Duncan.

10 MR. WHITE: It sounds like a Compact issue  
11 and I know that in the case of Nebraska the other  
12 members of the Compact sued Nebraska and they won in  
13 court for them to --

14 MR. KILLAR: I agree. They won in court.  
15 We got compensation from the State of Nebraska, the  
16 developer. The site got compensation for the costs  
17 that they expended in the development of the license.  
18 But it did not resolve the problem of having a low-  
19 level waste disposal facility in the Compact.

20 FACILITATOR CAMERON: But even though NRC  
21 has regulations governing low-level waste disposal  
22 that doesn't obligate any state including an agreement  
23 state to site to license a low-level waste disposal  
24 site.

25 MR. KILLAR: At the same time, it doesn't

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 obligate them to accept it. The way it's written  
2 right now it gives them the opportunity to keep it  
3 from being in there in the NRC at this point and the  
4 way the regulations are written will not prevent that  
5 from occurring. So therefore you are impeding  
6 interstate commerce.

7 FACILITATOR CAMERON: No. I don't know if  
8 the NRC would agree with that particular example.

9 (Off the microphone comments.)

10 Richard, do you want to say something on  
11 that?

12 MR. HAYNES: I don't think that that's an  
13 NRC issue. That's strictly a Compact issue. The  
14 Compact has authority over that, not NRC.

15 (Off the microphone comments.)

16 FACILITATOR CAMERON: All right.

17 MR. YEAGER: Well, no. They're using the  
18 Compact system as an out. If the state joins the  
19 Compact, then the host state has been chosen to be  
20 that host state for that site. No other state can  
21 have a site imposed on them. That's the protection  
22 they're afforded by being a member of a compact. It  
23 has nothing to do with compatibility through the NRC.

24 FACILITATOR CAMERON: That's right. Yes.  
25 It's not like the fact that NRC has regulations to

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 regulate the licensing and operation of a low-level  
2 waste disposal site. That doesn't mean that a state  
3 is obligated to have the site.

4 MR. KILLAR: The point that I was trying  
5 to make is that the state was a host state. It was  
6 going through the process, but as a result of a change  
7 in administration they changed their policy and  
8 therefore imposed such requirements that it was not  
9 practical for that site to be the site.

10 Now they paid for it dearly. Yes. But it  
11 did not resolve in having a disposal facility. So it  
12 did impede interstate commerce from that perspective.

13 FACILITATOR CAMERON: I see where you're  
14 going with it. Strict regulations.

15 Arjun?

16 MR. MAKHIJANI: I have some concerns in  
17 this specific context about site-specific performance  
18 and what are the NRC's oversight responsibilities and  
19 whether it has been fulfilling them. In the specific  
20 instance of DU, my institute so far as I know is the  
21 only that has done an independent analysis of the two  
22 specific sites at which DU has proposed to be  
23 disposed, the one in Texas and the one in Utah.

24 And in both cases now this is a site-  
25 specific analysis, not generic, not what was done in

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 the SECY paper. Use the standard model. We  
2 presented it as expert testimony. We found in all  
3 scenarios in a number of different cases, humid, dry,  
4 whatever, that the Subpart C limits were violated by  
5 orders of magnitude. I mean you're not talking a  
6 factor of two. You're talking orders of magnitude,  
7 rem or hundreds of rem dose. In most cases, the dose  
8 limits were violated around 10,000 years give or take  
9 a few thousand years.

10 We also showed that in one case the  
11 license application document contained absurd numbers,  
12 more uranium than was ever mined to be disposed of at  
13 the site, and in the other case also contained even  
14 more absurd numbers, more uranium than the weight of  
15 the earth proposed to be disposed of per gram of soil.

16 FACILITATOR CAMERON: And in Part --

17 MR. MAKHIJANI: Let me come to the  
18 question.

19 FACILITATOR CAMERON: Arjun, you can use -  
20 - It's okay to talk about specific sites as examples  
21 for things that are relevant to this rulemaking, but I  
22 think that it gets a little bit uncomfortable when we  
23 move into the area about allegations about a  
24 particular site.

25 MR. MAKHIJANI: This is not an allegation.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 This is -- What I'm about to say is the NRC has these  
2 documents. We're happy to supply them to everyone. I  
3 just offered them to Dr. Burns. You know, if there is  
4 a mistake we will publish a correction. These are not  
5 allegations. They're scientific facts.  $10^7$  picocuries  
6 per gram has a certain amount of weight. If it's in  
7 your paper, that means something and you can translate  
8 it into a bunch of kilograms. That's not an  
9 allegation. That's simply a fact.

10 FACILITATOR CAMERON: I'm not saying that  
11 it's not true. I'm not saying that it's not false.  
12 I'm just saying that if there is a generic issue for  
13 this --

14 MR. MAKHIJANI: Yes, there is a generic  
15 issue.

16 FACILITATOR CAMERON: Then let's get to  
17 the generic issue.

18 MR. MAKHIJANI: But it requires a little  
19 preface because it has some history. The specific  
20 question is all of these facts are known and have been  
21 repeatedly been pointed out in various ways to the  
22 NRC. I've also explicitly said -- This is not an  
23 issue about the sites. It's an issue about NRC  
24 oversight and whether the NRC is actually fulfilling  
25 its responsibilities and that the Agreement States

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 happen to sanction things that are unscientific and  
2 technically unsupported whether the NRC actually does  
3 anything, whether its IG does anything, whether its  
4 Commissioners take any action and we have not seen any  
5 action for four years despite personally bringing this  
6 up with NRC Commissioners, despite presenting it in  
7 expert testimony, with the result that even though the  
8 only independent calculations that were not challenged  
9 by either LES or the NRC or the State of Utah showed  
10 that the dose limits would be greatly violated. This  
11 proceeding is now looking at shallow land burial as if  
12 arid disposal would be okay without ever having  
13 properly reviewed the site-specific analysis that were  
14 presented and available to the NRC.

15 I consider this a pretty gross failure of  
16 NRC oversight and I would like to know what is the  
17 assurance that we have that the NRC's actually going  
18 to exercise some oversight over the actual site-  
19 specific analyses that are done because I feel in the  
20 present instance in both cases it has not done so.  
21 I'd like to know what is the process by which the NRC  
22 is actually going to regulate Agreement States in  
23 these documents that are produce because in the past  
24 it has not done it.

25 FACILITATOR CAMERON: To bring Arjun's

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 concern into this rulemaking, compatibility level is  
2 set for the site-specific performance assessment and  
3 it could be a wide range. It could be whatever. How  
4 is a member of the public going to be assured that of  
5 the NRC oversight of what the state is doing, at  
6 least, in terms of those areas where there may not be  
7 flexibility for the state to ask? I think that's the  
8 question and, Duncan, it's an Agreement State  
9 question, oversight of Agreement States. Can you  
10 speak to anything there?

11 MR. WHITE: I guess in the current  
12 regulatory regime we have a dose limit that they  
13 require to meet for a waste disposal facility and  
14 again, as I said, that's the same for everybody.  
15 Compatibility A. Again, the state has to demonstrate  
16 -- the licensing authority has to demonstrate that the  
17 site operator is meeting that and they will use, I  
18 guess, appropriate models, appropriate performance  
19 assessment tools, to show that. Again, they have some  
20 flexibility in how they do that.

21 Will they do the same stuff as the NRC? I  
22 don't know that. I mean maybe some of the other  
23 technical people could answer that question. That's  
24 certainly the case. What we would review for the  
25 Agreement State is that they have their own internal

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 procedures and protocols and we would see are they  
2 following them and are they appropriate.

3 FACILITATOR CAMERON: You had told Tom  
4 beginning of this conversation that if a licensee had  
5 a problem with what the agreement state was doing vis-  
6 à-vis compatibility, they could bring that to the  
7 attention of the NRC. In this case if a member of the  
8 public had a concern about what an Agreement State was  
9 doing or not doing, is the remedy to contact the NRC  
10 Agreement State Program to inquire about this?

11 MR. WHITE: I mean again they are the  
12 licensing authority. They would be best equipped to  
13 answer that question.

14 MR. ESH: So I think the question is when  
15 you do an audit of one of these reviews by the  
16 Agreement State, do we in any instance do the review  
17 in order to do the audit of the review is your  
18 question. You could review the process. That's one  
19 way to do the audit or you could do an independent  
20 review or assessment or essentially do the review  
21 yourself in order to do the audit of the review that  
22 the Agreement State did.

23 That's the question that you're asking.  
24 To what detail do you need to do that? Do we in this  
25 Agreement State what do we need to do to ensure that

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 the compatibility requirements are being met? Right?

2 MR. MAKHIJANI: No, Dr. Esh. Actually, it  
3 is a much lower bar. In this particular case, the  
4 items in question, the material in question, was not  
5 just introduced as a member of the public and it  
6 wasn't introduced to the Agreement States. It was  
7 introduced in the context of a license that the NRC  
8 was considering granting and in which the disposal of  
9 DU from enrichment plants was a very material and  
10 central issue.

11 And the NRC staff lawyer asserted that the  
12 reported question that contained the numbers that I've  
13 just cited was scientifically sound. And I testified  
14 that it contained this information that said it would  
15 dispose of more uranium than the weight of the earth.

16 I also pointed this out to an NRC Commissioner and  
17 the entire thing was ignored.

18 My testimony was never rebutted. It was  
19 never said that I was wrong. And if I am wrong I will  
20 publish a correction. My website has errata on the  
21 home page. But even though it was formally presented  
22 four years ago, this problem has neither been  
23 corrected by the State of Utah and I have presented  
24 this to the State of Utah as well nor has it been  
25 corrected by the NRC nor am I aware that even a pencil

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 has been lifted to try to correct it nor have I ever  
2 received a phone call to say what was my problem.

3 FACILITATOR CAMERON: Okay. Arjun, all I  
4 can suggest to you is that just because an issue is  
5 raised in a licensing processing doesn't mean that  
6 it's going to get into the channel of the NRC that is  
7 going to review the issue in terms of the Agreement  
8 State Program and you can raise that issue with the  
9 Agreement State Program. You can sit in on the public  
10 meeting IMPEP review of the particular state. Those  
11 issues can be raised. I don't know how they're going  
12 to be resolved, but those issues can be raised.

13 And I want to close this off by going to  
14 Mike and then Tom, hear quickly from Diane and go to  
15 the audience.

16 Michael.

17 MR. RYAN: (Inaudible).

18 FACILITATOR CAMERON: Use the mike.

19 MR. RYAN: There we go. I apologize,  
20 Charles. In thinking about the Agreement States, a  
21 couple of facts strike me. There's something like  
22 17,000 Agreement State licensees and something like --  
23 is it 9,000 or 7,000 NRC licensees?

24 MR. WHITE: It's going closer to 3,000 NRC  
25 licensees now.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. RYAN: Three thousand.

2 MR. WHITE: And 19,000 Agreement States.

3 MR. RYAN: Okay. So it's a big difference  
4 between NRC licensees and Agreement States. My point  
5 is the actions in the Agreement States. So part of  
6 the audience for your work products and all the things  
7 we've talked about over the two days of guidance and  
8 what ought to be in that and all of that is really  
9 aimed at Agreement States.

10 So I would put on your thinking cap and  
11 try and think about how you can engage them at this  
12 earlier stage of planning and what they might like to  
13 see or get in some way. Maybe it's to go to the  
14 Conference of Radiation Control Program Directors or  
15 other resources like that to get their input and maybe  
16 having a workshop like this with them and make sure  
17 that you feel comfortable that you have alignment with  
18 what their needs might be if when they should or are  
19 dealing with low-level waste issues.

20 I think if you do that early in the  
21 process and come up with products that reflect that  
22 input the likelihood of being aligned with the review  
23 process through the IMPEP program in the Agreement  
24 States is a lot higher. So that's my suggestion is to  
25 take that very large body of licensees who might be

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 the ultimate users of a disposal site in an Agreement  
2 State and have an Agreement State license themselves  
3 and get that constituency's input at an early stage in  
4 your process now.

5 Thank you.

6 FACILITATOR CAMERON: Okay. Thanks, Mike,  
7 and obviously during this initial stage we're trying  
8 to get Agreement State input from their presence at  
9 the table.

10 MR. RYAN: Again, I should have  
11 immediately added and, of course, with the South  
12 Carolina representatives that's one important  
13 Agreement State that has a long history on this issue.

14 But there are 34 others now or 33 plus one soon to be  
15 added. Thirty-six, okay.

16 FACILITATOR CAMERON: And Larry wants to  
17 say something about this, but I can tell you just from  
18 doing the convening for the workshop that the  
19 Organization of Agreement States and CRCPD know about  
20 the workshop and the issues and Mark actually  
21 referenced that when he did his introduction.

22 Larry.

23 MR. CAMPER: Mike, I want to make sure a  
24 question for clarification, a comment and  
25 clarification. When we were developing the SECY, we

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 did confer with the Agreement States of Texas, South  
2 Carolina, Washington, Utah and shared with them the  
3 options we were considering and where we were heading  
4 toward in what was ultimately Option No. 2. There was  
5 a strong and uniform alignment behind that amongst  
6 those Agreement States. They favored the idea of  
7 imposing a performance assessment for a number of  
8 different reasons.

9 But having said that I think I hear you  
10 saying "Well, go talk to all the Agreement States"  
11 because they have the users of this material or  
12 generators of this material and try to gain a greater  
13 insight from the Agreement State perspective.

14 MR. RYAN: I think that's one aspect of  
15 it. The other is keep going with what you started on  
16 the SECY process on the technical process. David is  
17 developing technical tools. So if the Agreement  
18 States are familiar with them, have had input into  
19 them, and you've adjusted based on that input whether  
20 they're currently a sited state or whether they  
21 eventually become a sited state, they'll be more  
22 familiar with the tools and techniques that they're  
23 going to use to get a license and then ultimately the  
24 Agreement State Program will be evaluated against. Do  
25 you follow me?

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. CAMPER: I do, and I think that's why  
2 I asked the question. Because if we looked at the  
3 probability of additional states becoming hosts for  
4 low-level waste disposal sites I mean we don't see  
5 much potential out there.

6 MR. RYAN: Well, if I told you 25 years  
7 ago there were going to be so many sited states and  
8 low-level waste compacts and three sites left, you  
9 probably would have said, "I don't think that." I'm  
10 just saying if we lay the groundwork and the technical  
11 work products to get input from the Agreement States  
12 now they're going to be a lot better later on.

13 FACILITATOR CAMERON: Okay. Thank you.  
14 We're going to go to Tom, Diane, check in with the  
15 audience. Go to the next short subject.

16 MR. DORNSIFE: While you're going through,  
17 can I just have one very quick one?

18 FACILITATOR CAMERON: Sure, but let's go  
19 to Tom and Diane first.

20 MR. DORNSIFE: All right.

21 FACILITATOR CAMERON: Tom.

22 MR. MAGETTE: I just want to correct what  
23 I think is pretty serious misrepresentation since  
24 we're keeping a record here. The notion that there  
25 have been two independent and therefore more accurate

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 assessments of the disposal of the depleted uranium at  
2 the Clive site and the WCS site that they've somehow  
3 been overlooked or ignored is not true. The  
4 conclusions and the expert testimony were, in fact,  
5 part of a proceeding and they were rejected by the  
6 Atomic Safety and Licensing Board in that hearing.

7 That decision was appealed to the  
8 Commission and the Commission ratified the conclusion  
9 of the Atomic Safety and Licensing Board which  
10 included technical experts and also rejected those  
11 conclusions. So this notion that there's some  
12 extraordinarily valid work floating around out there  
13 that's been ignored is simply not the case.

14 FACILITATOR CAMERON: Okay. Thank you.

15 Diane.

16 MS. D'ARRIGO: There is not a disposition  
17 pathway now for depleted uranium and in the proceeding  
18 for the LES facility we're making the case that  
19 there's not a place for that waste to go and that  
20 didn't stop the licensing. So there will be a lot  
21 more depleted uranium to be dealt with and now we are  
22 trying to increase allowed doses or change regulations  
23 or find a place to put this stuff and we're talking  
24 about a lot more of it than we already have to deal  
25 with.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 I just think we have to have that  
2 perspective on it that the industry does not deserve a  
3 blank check to continue to generate waste for which  
4 there's no disposal and tweaking regulations here and  
5 there and millirems and rems and different criteria in  
6 the performance assessments is a fine technical  
7 exercise. But the reality is it's probably going to  
8 leak wherever it goes. So we're deciding how much is  
9 okay to leak and that's a real frustrating perspective  
10 when we have a world that has a lot of pollutants that  
11 are in there and we're not even beginning to look at  
12 the larger picture of the possibility of maybe going  
13 forth without producing more known poisons, known  
14 toxins, known carcinogens.

15 That at least needs to be considered and  
16 it doesn't seem to be able to be considered in any of  
17 these frameworks. We're always looking at where we  
18 can allow more allowable contamination, higher levels,  
19 itty-bitty little levels but more and more everywhere  
20 and I'm just representing the perspective that a lot  
21 of people don't want more at all.

22 FACILITATOR CAMERON: Okay. I think  
23 people understand that perspective.

24 MS. D'ARRIGO: Yes. That's why I'm here.

25 FACILITATOR CAMERON: And obviously some

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 people would think that site-specific performance  
2 assessment is going to help in terms of preventing  
3 release from these sites. Certainly the long-term  
4 rulemaking that Larry is going to talk about very  
5 shortly will go to that.

6 Bill.

7 MR. DORNSIFE: I guess I, unfortunately,  
8 started this discussion with I thought was a simple  
9 question. Let me rephrase that question to make --  
10 Hopefully, I can get a simple answer. Obviously, when  
11 NRC regulates reactors, they are not going to  
12 implement their regulations in any way that would  
13 create an unfair competitive advantage between one  
14 reactor or another.

15 Does NRC feel they have any obligation  
16 either under Atomic Energy Act authority or any other  
17 Federal authority that if indeed implementation of  
18 their regulations even through an Agreement State  
19 Program is creating an unfair advantage that they have  
20 any obligation to correct that?

21 FACILITATOR CAMERON: Duncan, do you have  
22 an answer to that? I mean, you've talked about the  
23 fact that the NRC in setting compatibility levels  
24 looks at perhaps interference with interstate commerce  
25 and things like that but that may be --

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. CAMPER: The Nuclear Regulatory  
2 Commission's regulations are designed to protect  
3 public health and safety. One of the criteria that we  
4 do not consider when reviewing an application for  
5 license is whether it does or does not provide an  
6 unfair or fair competitive advantage. Simple.

7 FACILITATOR CAMERON: Okay. Thank you.

8 And, Arjun, I just have to ask you not to  
9 -- I mean you had a statement. Tom responded and I  
10 just have to stop it on this point. So did you have -  
11 -

12 MR. MAKHIJANI: A sixty second factual  
13 matter.

14 FACILITATOR CAMERON: Go ahead.

15 MR. MAKHIJANI: As a factual matter, there  
16 was no rebuttal of our technical work that was ever  
17 given either by LES or NRC or NRC staff.

18 As a second point, the license was not  
19 based on the rejection of our work or even based on  
20 disposal of DU or WCS or Clive, Utah. Ultimately the  
21 Commission took refuge in the law that said DOE has to  
22 accept DU and the DU estimate of disposal cost would  
23 be accepted and that was the end of it. We were not  
24 even given an appropriate opportunity to examine all  
25 of the details of that. That's how the license was

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 granted.

2 FACILITATOR CAMERON: Okay. I would just  
3 commend people to read the licensing board and the  
4 Commission decision on this case and arrive at their  
5 own conclusions on it.

6 Does anybody have anything in the audience  
7 on Agreement State issues? Yes, sir. And please  
8 introduce yourself to us.

9 MR. JAMES: My name is David James. I'm  
10 with DW James Consulting. I do some consulting work  
11 for EPRI.

12 I just want to make a point. This goes  
13 back to the Atomic Energy Commission, but I think it  
14 was in 1972 or '73 the State of Minnesota applied  
15 higher discharge/low discharge limits than what the  
16 NRC licensed and the NRC took issue with it and went  
17 to the Supreme Court I believe and the State of  
18 Minnesota won the case. So the reality is that any  
19 time the state wants to apply higher limits they  
20 probably can. That's the main thing.

21 The other thing was every atom of U<sub>238</sub> that  
22 is being disposed here has always been on this earth.

23 FACILITATOR CAMERON: Has always been  
24 what?

25 MR. JAMES: Has always been on this earth.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 FACILITATOR CAMERON: Okay. Thank you.

2 Okay. Larry, long-term rulemaking, waste  
3 classification.

4 MR. CAMPER: Thank you, Chip.

5 Yesterday during my opening comments I  
6 pointed out that this is a two-step process. What  
7 I'll talk about now is the second step which we refer  
8 to as "The Long-term Rulemaking on Waste  
9 Classification."

10 The second part of this rulemaking effort  
11 as I said is what we're calling a longer-term  
12 rulemaking. The text from the SRM says specifically  
13 the Commission directed the staff to propose the  
14 necessary resources for a comprehensive revision to  
15 risk inform the 10 CFR 61 Waste Classification  
16 Framework with conforming changes to the regulations  
17 as needed using updated assumptions and referencing  
18 the latest International Committee on Radiation  
19 Protection Methodology (ICRP). As part of this  
20 effort, staff will identify any corollary or  
21 conforming legislative changes necessary to support  
22 this rulemaking, if any, as well as recommendations on  
23 how to proceed absent such legislation being enacted  
24 and other agencies that may be impacted by any  
25 changes.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1           This effort should explicitly address the  
2 waste classification of depleted uranium. In  
3 addition, this effort should include the performance  
4 of a technical analysis for public comment concerning  
5 the disposal in a near surface facility for any long-  
6 lived radionuclides, including uranium. This analysis  
7 and the resulting comments should inform the staff's  
8 eventual recommendation to the Commission on an  
9 appropriate generic requirement addressing such  
10 disposals.

11           This revision would likely involve  
12 different, updated methodologies and assumptions in  
13 the Part 61 methodology for key variables such as  
14 disposal configurations, performance periods,  
15 institutional control periods, waste forms, site  
16 conditions, exposure pathways and receptor scenarios.  
17 This effort would explicitly address the waste  
18 classification for depleted uranium as I mentioned and  
19 it would reflect current knowledge of the performance  
20 of low-level waste disposal facilities and would  
21 present risk-informed concentration limitations for  
22 all radionuclides, not just selectively for depleted  
23 uranium. This revision would accurately represent our  
24 increased understanding today rather than relying on  
25 the Part 61 analysis conducted approximately 30 years

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 ago.

2 An update of the methodology used to  
3 develop the concentration limits could result in  
4 higher or lower concentration limits than currently  
5 used which could actually increase or decrease  
6 disposal options for some types of waste. For  
7 example, current Class B/C waste could become Class A  
8 waste perhaps.

9 As part of the staff's evaluation, we  
10 would consider the International Waste Classification  
11 System as well and see if it is applicable to our low-  
12 level waste environment here. Internationally, they  
13 have a different classification scheme with six  
14 classes of waste as depicted on the slide.  
15 Internationally, countries have stressed the role for  
16 site-specific performance assessment. The IAEA  
17 published a Safety Guide No. 111-G-1.1 that is about  
18 to be updated for the 1994 edition.

19 The updated version distinguishes between  
20 LLW and Intermediate Level Waste (ILW) for long-lived  
21 alpha emitters like  $U_{238}$ . The guide says that  
22 "national authorities should establish limitations fo  
23 the disposal of long-lived radionuclides for near-  
24 surface disposal based on safety assessment of a site-  
25 specific disposal facility." The guide also states

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 that "a very definitive boundary between ILW  
2 (Intermediate Level Waste) and LLW cannot be provided.

3 Waste acceptance criteria for a particular facility  
4 will be dependent upon the actual design of and  
5 planning for a near-surface disposal facility, for  
6 example, engineered barriers, duration of  
7 institutional controls, site-specific factors and so  
8 forth."

9 It is important to note that overseas most  
10 countries have not disposed of significant quantities  
11 of DU. According to a 2001 NEA report, "Management of  
12 Depleted Uranium," all of the major nuclear fuel  
13 producing countries are storing depleted uranium with  
14 expectations that an eventual use will be found for  
15 it. In the U.S., NRC's policy is that the generator  
16 can determine if there is a use for their depleted  
17 uranium or when in fact it becomes waste.

18 As we proceed into this longer-term  
19 rulemaking and I mentioned yesterday that it's  
20 currently in budgeting place planned for FY 2011 to  
21 start it, FY 2011, we would certainly plan to have  
22 additional workshops to collect your input throughout  
23 the course of that particular rulemaking and hold a  
24 number of technical and legally oriented workshops to  
25 consider all the various viewpoints.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1           Because of the scope of this long-term  
2 rulemaking is large, there would certainly be  
3 significant opportunities for public comment. I do  
4 think it is fair to say that when we move into this  
5 longer term rulemaking to risk inform the waste  
6 classification scheme of Part 61 that that would  
7 generate a tremendous amount of interest and I would  
8 envision, for example, that that rulemaking would  
9 probably take minimally three to four years.

10           I think I'll stop right there and see if  
11 you have any questions or discussion.

12           FACILITATOR CAMERON:       Okay.       Thanks,  
13 Larry. I would just note that from the parking lot  
14 that yesterday morning Arjun raised the issues that  
15 all options should be considered in this rulemaking  
16 including the change in waste classifications. And,  
17 Arjun, am I representing that correctly what you said?

18           MR. MAKHIJANI:       Well, yes.       If you're  
19 going to have a risk-informed rule. I'm not endorsing  
20 that we should revisit this regulation, but since the  
21 NRC has decided to revisit it I think we should  
22 revisit it fully. And just to clarify since the  
23 question has come up, I will simply say that we are  
24 now investigating the whole framework of all  
25 environmental health protection and it's our view at

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 the Institute that so far all this regulation takes  
2 the point of view of the polluter because it follows a  
3 single pollutant and does not take the point of view  
4 of the public which receives all pollutants or a  
5 number of pollutants at the same time and therefore is  
6 not concerned with health protection.

7 I would ask that any risk-informed process  
8 take the point -- I recognize that we need to follow  
9 pollutants in order to regulate them, but that doesn't  
10 mean that we can ignore the public just because we  
11 can't understand synergies, for example, and that any  
12 new process especially as it will set a precedent for  
13 lots of other processes consider the point of view of  
14 the public, specifically, that they are exposed to  
15 chemicals and radiation at the same time.

16 And we will be publishing a report on  
17 synergisms in the coming months and I would be happy  
18 to send it to you. I've already mentioned it to  
19 people in the NRC and the EPA.

20 FACILITATOR CAMERON: Thank you, Arjun,  
21 and I think it would also be useful to send it to Dan  
22 at the EPA.

23 MR. MAKHIJANI: We are in communication  
24 with the Office of Radiation and Indoor Air about this  
25 and I've already committed to send it to them. The

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 report is not yet complete and has not yet been  
2 reviewed. So in the coming months when it's done, we  
3 will send it.

4 FACILITATOR CAMERON: Okay.

5 Questions? Comments on the long-term  
6 classification? Bill.

7 MR. DORNSIFE: I guess I'm troubled if the  
8 decision on whether this material is suitable for  
9 shallow land disposal is going to be made after a  
10 decision on what to do. In terms of disposing it as  
11 shallow land burial, what happens if we determine it's  
12 not suitable for shallow land burial after we've  
13 disposed of it?

14 MR. CAMPER: Well, Bill, the material that  
15 we're talking about, of course, now near-surface  
16 disposal I mean as I mentioned yesterday and I had a  
17 graphic that showed that and I don't know if Patty  
18 will use that slide -- no, I guess you're not -- but I  
19 had a graphic yesterday that pointed out under the  
20 long-term rulemaking DU that gets disposed of between  
21 now and then will need to be specifically addressed in  
22 the long-term rulemaking.

23 Now what will that say? I don't want sit  
24 here and try to prophesize. What I do know is that  
25 it's not uncommon at all when rules are created that

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 things are not retroactively addressed. They're  
2 grandfathered if you will. That is a possible outcome  
3 of this. No one has said directly or implied that  
4 there would be a requirement to go and dig this  
5 depleted uranium up. I didn't say that yesterday and  
6 we're not suggesting that now. What I am saying is  
7 that the long-term rulemaking clearly in the  
8 statements of consideration would need to specifically  
9 address that DU which has been disposed.

10 FACILITATOR CAMERON: And is it possible  
11 that one result could be, one option is, that the  
12 site-specific performance requirement would take care  
13 of the issue?

14 MR. CAMPER: That's a -- Yes, I was going  
15 to say that next. I think that's a very good point.  
16 I think what you have to bear in mind when you ponder  
17 this question is that whether it be depleted uranium  
18 which has been disposed of today presumably has been  
19 disposed of safely. There has been a performance  
20 assessment conducted. Depleted uranium which would be  
21 disposed of between now and then, we yesterday pointed  
22 out, for example, that we think it would be prudent to  
23 reexamine performance assessments.

24 I mean the material that would be disposed  
25 of between now and the time this revision of Part 61

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 would occur would presumably have been disposed of  
2 safely in a manner that protects public health and  
3 safety.

4 FACILITATOR CAMERON: Let's go to Tom and  
5 then to Christine and then we'll go across the way.

6 MR. MAGETTE: I have a question, Larry.

7 MR. CAMPER: Sure.

8 MR. MAGETTE: You made reference to DU  
9 disposed of between now and then. What about DU  
10 disposed of prior to now? I mean if you start looking  
11 at what's already in a site it's not just the  
12 currently operating sites that might be in that  
13 dataset, Maxie Flatts, Beatty, West Valley, Sheffield.  
14 Are you going to require something of them possibly?

15 MR. CAMPER: Again, I want to sit here and  
16 preordain what the final rule would say about  
17 previously disposed of material. What I do know as I  
18 said before is it's no uncommon that this type of  
19 activity is grandfathered under the assumption and  
20 verification that it was, in fact, disposed of safely  
21 previously.

22 But clearly the long-term rulemaking would  
23 need to address this particular question straight on  
24 in the statements of consideration. I just don't want  
25 to prophesize as to what I would say.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 FACILITATOR CAMERON: Christine.

2 MS. GELLES: I would offer once again that  
3 perhaps the Department of Energy has some experience  
4 on these sorts of matters. I'm thinking of the change  
5 in the definition of transuranic waste and given that  
6 this rulemaking would be a risk-informed rulemaking I  
7 think one way in which it could address not just  
8 previously disposed of DU between today and five or  
9 six years from now or any DU or any waste stream where  
10 it's impacted by a revised classification scheme would  
11 factor in the risk associated with exhuming previously  
12 disposed of wastes. So again we have that experience  
13 in terms of dealing with pre-1970 transuranic waste if  
14 such a waste classification actually exists. We look  
15 forward to being in dialogue with you on that as well.

16 FACILITATOR CAMERON: Thank you.

17 Do you have anything on that?

18 MR. CAMPER: When you have any more  
19 questions, I have one more final comment I wanted to  
20 make whenever you're ready.

21 FACILITATOR CAMERON: Diane.

22 MS. D'ARRIGO: You probably know, but we  
23 will continue to oppose exempting radioactive waste  
24 and declaring very low-level waste not radioactive  
25 enough to regulate. Just a reminder.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 FACILITATOR CAMERON: Okay. And Felix.

2 MR. KILLAR: So on the other side of the  
3 coin we assume that as you go forward and start  
4 looking at this material as previously been disposed  
5 you'll take into consideration backfit provisions for  
6 the material that came from a Part 50 site and a Part  
7 70 site and a Part 76 site. I realize Parts 30 and 40  
8 right now do not have backfit provisions, but they are  
9 moving in that direction. So I think you need to  
10 think about the impact and include that in your  
11 analysis.

12 MR. CAMPER: You are absolutely right.  
13 Backfit types of considerations go into reaching a  
14 position as to what has been disposed of previously.  
15 I mean, you're right.

16 FACILITATOR CAMERON: And, Bill, and we're  
17 going to take a break after this.

18 MR. DORNSIFE: I guess I didn't catch  
19 that, but in this extended rulemaking are you  
20 considering the issue of very low-level waste and  
21 alternate disposal?

22 MR. CAMPER: In this particular  
23 rulemaking?

24 MR. DORNSIFE: Yes.

25 MR. CAMPER: That's a very interesting

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 question as I said a moment ago. I mean the  
2 Commission gave us a particular direction at this  
3 moment in time to budget for risk informing the waste  
4 classification scheme. That was the direction. We  
5 assumed as we said yesterday that to budget for it is  
6 to proceed unless the Commission would direct us  
7 somewhere along the line not to proceed.

8 I think what's interesting is when you  
9 start to examine Part 61 with the idea of risk  
10 informing the waste classification scheme it's going  
11 to raise a litany of questions not unlike the ones  
12 that you're alluding to here, Bill. I think, I've  
13 always thought, that once you went into Part 61 unless  
14 you had a very specific narrow focus in the rulemaking  
15 like this limited rulemaking is, but once you go  
16 beyond that and I think once you start to open up Part  
17 61, it will raise a lot of questions.

18 And I think, therefore, for a myriad of  
19 reasons, some of which are purely economic, some of  
20 which are public concerns, various stakeholders'  
21 views, it will become I believe in my personal view a  
22 very complicated regulation that will open up a lot of  
23 questions. And maybe that's not a bad thing. I mean  
24 maybe that's the way it should be. But we shall see.

25 And, of course, what we'll try to do as we

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 proceed down this path and we begin to see those kinds  
2 of issues emerging we'll make it a point to  
3 communicate with the Commission on a regular basis to  
4 make sure they understand how this is starting to  
5 shape up and what the implications are and what would  
6 you like for the staff to do about it.

7 MR. DORNSIFE: Just another question  
8 quickly.

9 MR. CAMPER: Yes.

10 MR. DORNSIFE: In the international  
11 community, how do they typically deal with these waste  
12 streams that are lower than low level?

13 MR. CAMPER: In the international  
14 classification process, there is an exemption. There  
15 is a clearance level if you will.

16 MR. DORNSIFE: Right.

17 MR. CAMPER: An exemption. That's  
18 actually one of the categories, exempt waste. We  
19 don't have exempt waste as a waste category. What  
20 Diane was referring to I think is the fact that under  
21 our 20.2002 process which is a pathway in Part 20 that  
22 says you may seek approval to dispose waste by some  
23 means not otherwise authorized in the regulations.  
24 Very low levels of waste with very minimal dose limits  
25 typically on the order of a few millirem.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 MR. DORNSIFE: You have obviously --

2 FACILITATOR CAMERON: Bill, you have to  
3 talk into the mike.

4 MR. DORNSIFE: Some concentrations.

5 MR. CAMPER: We do.

6 FACILITATOR CAMERON: You need to talk  
7 into the mike.

8 MR. DORNSIFE: You have exempt  
9 concentrations.

10 MR. CAMPER: Yes, we do.

11 MR. DORNSIFE: That are then related to  
12 waste.

13 MR. CAMPER: That is true. We do. But in  
14 the case she was referring to we do grant exemptions  
15 of certain cases when the 20.2002 process is followed.  
16 I think that's what she was referring to.

17 FACILITATOR CAMERON: Okay. Christine.

18 MS. GELLES: I think this is a quick  
19 question, Larry. I agree with you that as you start  
20 to look at Part 61 it opens up a lot of issues ranging  
21 from the very low activity waste as well as up to  
22 where does it end. Does it end at intermediate level  
23 waste or does it start to creep into Part 60?

24 MR. CAMPER: Well, again, a great  
25 question. At the moment what the Commission has

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 directed us to do is to proceed with a rulemaking that  
2 would risk inform the waste classification scheme and  
3 I read you the specific directions to the staff. That  
4 is the charge to the staff at the moment.

5 Now what will happen is as a practical  
6 matter once you head into that particular rulemaking  
7 we're going to start to have workshops, have public  
8 discussions and the very kinds of questions that  
9 you're raising and that Bill is raising will be  
10 raised. And I suspect what will happen as a practical  
11 matter is the staff will be communicating with the  
12 Commission along the way and we will making some  
13 adjustments or seeking permission to make certain  
14 adjustments in the assignment and it will be a  
15 dynamic.

16 But at the moment the SRM says to do what  
17 I said to do awhile ago. But might that change along  
18 the way? I suspect that's certainly possible.

19 FACILITATOR CAMERON: And Arjun.

20 MR. MAKHIJANI: Just a couple of things  
21 quickly. In one case in Idaho, the DOE is actually  
22 exhuming some varied transuranic waste currently in  
23 Pit 9 I think if I'm not mistaken.

24 The second thing is to the best of my  
25 understanding in the European or some of the European,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 British and French I think, the intermediate level  
2 waste which is required to be disposed of at non  
3 service and deep disposal some of our Class B would  
4 fall into that category and certainly Class C waste,  
5 long-lived Class B and Class C waste.

6 And in the final comment and then followed  
7 by a question is the current regulations, many of  
8 them, 25 millirem per year if you take it as whole  
9 body does not correspond to our risk level of  $10^{-4}$  to  
10  $10^{-6}$  over a life time. In fact, it's considerably more  
11 than that as you know and if we're going to go to  
12 something risk informed, we would expect that the  
13 lifetime cancer incidence risk would stay within what  
14 the government has been telling the public but not  
15 actually implementing. My question is do you have a  
16 range of lifetime cancer risk that you are targeting  
17 that you can tell the public.

18 MR. CAMPER: Our current dose-based  
19 approach is different than the risk-assigned approach  
20 that the EPA uses in the  $10^{-4}$  to  $10^{-6}$  that you're  
21 referring to. They use a different approach.

22 Now I think for the moment the best I  
23 could answer your question would be as we look at a  
24 risk-informed examination of the waste classification  
25 scheme the mindset that we go into that particular

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 rulemaking undertaking and I just gave one example  
2 here of looking at the international approach is we  
3 have to go into a risk-informed revision of Part 61  
4 Waste Classification Scheme with an open mind. I  
5 think we have to explore all those kinds of options  
6 and form views and communicate with the Commission  
7 along the way as to how it would like to go.

8 Otherwise, I think we would be sort of  
9 preordaining or prejudging the outcome. I think the  
10 staff will be looking at all possible options.

11 FACILITATOR CAMERON: Okay. Thanks.  
12 We're going to go to the audience now. But just for  
13 information, the SRM you mentioned was SRM SECY-08-  
14 0147 and it is on the website that was posted for  
15 this.

16 Any questions on here on long-term  
17 classification rulemaking? Anybody?

18 (No verbal response.)

19 Okay. We don't have a whole lot left to  
20 do, but why don't we take a break for 15 minutes and  
21 then we'll come back and we'll try to finish up with  
22 alacrity. Off the record.

23 (Whereupon, a short recess was taken.)

24 FACILITATOR CAMERON: On the record.  
25 Okay. We're going -- I don't know if we're going to

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 close out fairly quickly. We have some issues to  
2 discuss. But we had this topic, Other Considerations,  
3 on the table and the three issues that were going to  
4 be discussed there have already been discussed. One  
5 was the thing we started off with this morning on what  
6 happens in the interim and we got lots of input on  
7 that.

8 The second issue was what do you do with  
9 the existing inventory at a site where there's a  
10 proposal to dispose of more DU and I think that was  
11 covered in terms of source terms a lot of other times  
12 during the meeting where you have to consider that in  
13 your performance assessment.

14 The third one was something that we  
15 originally weren't going to which was the Maxie Flatts  
16 situation which is sites that are not anticipating to  
17 have DU there. What's the impact of this particular  
18 rule? Tom asked that question and I believe we had an  
19 answer for it. I don't know if it was a satisfactory  
20 answer or not, but basically we've done all the other  
21 considerations. Although if anybody wants to speak  
22 some more on those, we can do that.

23 But, if not, I was just going to go to  
24 some parking lot issues to make sure we covered them  
25 and then ask for any final comments around the table

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 and have Larry close the meeting for us. Arjun, I was  
2 just saying that I think our other considerations have  
3 been handled. What happens in the interim before this  
4 rule is final? We talked about that and other issues.

5 MR. MAKHIJANI: Just one minor point. I  
6 have the French regulation.

7 FACILITATOR CAMERON: Oh good.

8 MR. MAKHIJANI: I will give a copy to Dr.  
9 Esh and do an informal translation for him. But I  
10 have a few other copies for whoever might want it.

11 FACILITATOR CAMERON: Thank you, Arjun.  
12 And please see Arjun on that.

13 And Patty.

14 MS. BUBAR: I just wanted to clarify. We  
15 did put this agenda item on the agenda, Other  
16 Considerations, anticipating that we would want to  
17 have some discussion on all these topics that Chip  
18 just reviewed and we didn't see them fitting so nicely  
19 into the items that we had put on the agenda, the  
20 technical items based on the questions or the items  
21 that were in the *Federal Register* notice.

22 For consistency purposes, we've got the  
23 same agenda proposed for Salt Lake City. So we'll  
24 keep this Other Considerations on the agenda for Salt  
25 Lake City, but I think it was good the way it happened

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 at this workshop where these items really got  
2 discussed when it was appropriate based on what the  
3 members of the roundtable wanted to talk about or when  
4 they wanted to talk about it.

5 But for Salt Lake City we will keep the  
6 agenda as it is and it may end up being just like this  
7 where we address those items throughout the two days  
8 and then don't really have any other considerations.  
9 It will be our time for getting to the parking lot  
10 issues.

11 FACILITATOR CAMERON: Okay. Thank you,  
12 Patty, for explaining that. Christine.

13 MS. GELLES: Thank you. Patty, the one  
14 thing I just wanted to ask was a clarifying question  
15 in terms of the NRC's expectations. I mean I know I  
16 heard Larry talk about or maybe it was Dave talk about  
17 mining the transcript to get the input. But I also  
18 heard a request for some written information and I  
19 just wanted to be clear about your expectations  
20 because the Department of Energy will evaluate whether  
21 or not we'll provide some written input, but we do not  
22 intend it to be a line-by-line response to the  
23 questions that were in the *Federal Register* because we  
24 felt the flow of the discussion here in the meeting  
25 according to the agenda was at the appropriate level

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 to get at the core issues rather than those more  
2 detailed questions that were in the *Federal Register*.

3 I just wanted to be up front about our considerations  
4 and potential plans and get your reaction to that if  
5 you wanted to offer one.

6 MS. BUBAR: Okay. Thank you.

7 MR. ESH: Yes, that's helpful. If people  
8 want to submit written information, we will certainly  
9 take it and we will use it. Basically, we'll use  
10 whatever information we have available whether it's  
11 the transcript, whether it's our meeting notes,  
12 whether it's written information. And certainly if  
13 you want to submit something in writing to us you  
14 don't have to address all the questions. You can  
15 address whatever the issue is you want to including  
16 your own issues that were maybe not on the agenda. So  
17 you're free. You have a lot of flexibility here.  
18 We'll just the information the best we can.

19 FACILITATOR CAMERON: And for the comment  
20 period, it closes when? October 30th. We will be  
21 having the meeting in Utah September 23rd and 24th.  
22 The participant list for the Utah meeting is on the  
23 website and I hope everybody has the URL for that.

24 And let me just go through some parking  
25 lot issues that remain. I think we've addressed a lot

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 of these issues. One of them was brought up very  
2 early by Arjun which is a response from the NRC to  
3 issues raised and from my discussions with the staff  
4 on this issue and I'm going to have them correct me if  
5 any part of this is incorrect and this ties into  
6 another issue which is what is the Commission going to  
7 hear about this meeting. I think the staff is going  
8 to summarize notable issues from this meeting  
9 including people who might have expressed disagreement  
10 with this is the right route to go in terms of the  
11 rulemaking and is going to submit that to the  
12 Commission and, Larry, Patty, is that something you  
13 think will be able to find its way onto the public  
14 website at this point or are you still debating about  
15 that about whether that's feasible?

16 MS. BUBAR: Larry can correct me if he  
17 disagrees with how I'm describing this. But you're  
18 right. We will get ourselves together and share our  
19 observations as well as maybe look at the transcript  
20 if we can get it in time and in between now and the  
21 Salt Lake City meeting we will have a summary, a quick  
22 summary, prepared of what we heard just so that we  
23 want to make sure we're as prepared or better prepared  
24 for Salt Lake City to address some of these issues  
25 that we anticipate coming up.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1           As far as what we will tell or if we will  
2 tell anything to the Commissioners, I think we're  
3 still deliberating that internally as to whether we'll  
4 do that in between now and the Salt Lake City  
5 workshop. Certainly, we'll give them a note tomorrow  
6 morning that will say that we had the workshop. You  
7 know, participants were here and really good issues  
8 were raised, things like that.

9           But we'll deliberately get ourselves  
10 together, all the staff that were here, and make sure  
11 that we clearly understand what are some of the issues  
12 that we have to be prepared to continue to discuss for  
13 the Salt Lake City workshop. But I don't know that we  
14 have any answers to when we will communicate with the  
15 Commissioners.

16           FACILITATOR CAMERON: All right. Thank  
17 you, Patty.

18           This issue was answered by Larry, but I  
19 just wanted to make sure that everybody understood  
20 this, the issue of whether an environmental impact  
21 statement should be done for this rulemaking. And  
22 NEPA, National Environmental Policy Act, does apply to  
23 major Federal actions including rulemaking.

24           Larry noted that the first step is to do  
25 an environmental assessment and in that environmental

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 assessment is a determination of whether there should  
2 be a full-blown EIS. Questions came up about the  
3 timing of that. In some cases, that EIS/EA is done  
4 when the proposed rule is published, but because of  
5 the amount of preparation involved I think the staff  
6 is going to have to think about what's feasible, when  
7 that is to be done. And, Larry, do you want to say  
8 anything else about that?

9 MR. CAMPER: No, I think that's a pretty  
10 good summary, Chip. I mean when you step through the  
11 environmental assessment process you trip to at some  
12 point either a, FONSI, a finding of no significant  
13 impact, or the need to, in fact, conduct an  
14 environmental impact statement. The staff would step  
15 through that process.

16 You have a regulatory basis to develop.  
17 You have the rule to develop. And you have the  
18 environmental assessment to do. Those are generally  
19 done in parallel for the obvious reasons because one  
20 of those affects the other.

21 But you're right. I think we'll just have  
22 to wait and see as we progress further down the road  
23 and actually get into the development of the rule just  
24 how that will come together. But clearly we will be  
25 doing an environmental assessment. It may or may not

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 result in a full-blown EIS and that's a function of  
2 the process.

3 FACILITATOR CAMERON: Thanks, Larry.

4 The one issue that was in the parking lot  
5 that I'm not sure that we gave a clear answer to and I  
6 see Duncan is gone, right? Okay. Well, did you all  
7 get a clear answer? I mean a clear question was  
8 raised. Is NRC guidance an element of the Agreement  
9 State capability? Did we answer that? It was a  
10 parking lot item and I thought it would be taken care  
11 of during Duncan's but I'm not sure we got there.

12 MR. CAMPER: Well, I actually did discuss  
13 it with Duncan when he was here. He just didn't bring  
14 it up. I made the point yesterday that when developer  
15 may rule and Duncan did have some information in a  
16 slide that talked about the various types of  
17 compatibility that are assigned and so forth.

18 The rule itself carries with it a level of  
19 compatibility. A particular guidance document, a  
20 NUREG, if you will for example, is not assigned a  
21 level of compatibility. But what does happen is the  
22 NRC staff and Agreement State representatives work  
23 together in a working group in formulating that rule  
24 and, of course, there's a great deal of coordination  
25 that goes on with the Agreement States in the course

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 of doing that. And similarly when guidance is  
2 created, that working group or a working group  
3 consisting of NRC and Agreement State regulators work  
4 together to develop that guidance.

5 Then the question becomes one of the IMPEP  
6 process and there's the state. There's a review of  
7 the rule itself that the state will develop to address  
8 the question of compatibility that is reviewed and  
9 then in the course of conducting of the IMPEP and  
10 looking at a vertical slice of how the state is  
11 implementing a particular regulation. That level of  
12 compatibility is reviewed and how is that going. But  
13 a guidance document itself is not assigned a level of  
14 compatibility.

15 FACILITATOR CAMERON: Okay. Thank you,  
16 Larry.

17 I'm just going to go around and start with  
18 Mike to see if you have any final observations for us  
19 on anything that has been discussed and let's go to  
20 Mike. Dr. Michael Ryan.

21 MR. RYAN: Thanks, Chip. I guess what I'd  
22 like to offer is a thanks to the staff for preparing a  
23 really thorough two-day workshop. You know, I think  
24 we've covered a large number and all the significant  
25 ones from my perspective on considering how to move

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 forward on the DU question.

2 I think we've had robust discussion on how  
3 some of the things that might come as work products  
4 from this effort could apply to other aspects of low-  
5 level waste and the connection that some of these  
6 things have to other issues in low-level waste. I  
7 really appreciate everybody's presentations and  
8 responsiveness in the dialogue of all the panel  
9 members. I think it's a success from my point of  
10 view.

11 FACILITATOR CAMERON: Thank you.

12 Greg?

13 MR. KOMP: Yes, I would also second that  
14 thought by Mike. It's been a very good workshop, very  
15 informative and I thought we got to the meat of a lot  
16 of the questions that are germane to this process.

17 I would like to leave a final thought that  
18 just a reminder that we are concerned with the variety  
19 of waste streams, DU, everything from like we talked  
20 about from the enrichment process. We do have some of  
21 that we are left sometimes liable for as with -- a  
22 couple years ago all the way through pure DU metal and  
23 everything in between probably.

24 Thank you.

25 MR. MAKHIJANI: Yes, I really think this

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 was a very productive workshop. I really appreciate  
2 how you moderated it and I think I want to thank  
3 especially Dr. Pinkston and Dr. Esh for the clarity of  
4 their presentation. I know it must have been a little  
5 stressful sometime with the exchanges, but I really  
6 think they couldn't have been the way they were if  
7 your presentations weren't technically thorough and I  
8 really appreciate that and I want to say that for the  
9 record. I appreciate that a record was made.

10 And I think I would appreciate if an EIS  
11 were done in this process. I think an EIS is required  
12 by how huge these issues are. The alternatives need  
13 to be properly considered.

14 And the one big concern I leave with is  
15 that the present process has set us on a course that  
16 is really leaning toward shallow land disposal in a  
17 way that our research over many years, a decade and a  
18 half about, on this subject indicates not appropriate  
19 for depleted uranium in large amounts. And I'm very  
20 concerned about that and I think the option of deep  
21 disposal in a WIPP-like repository ought to be part of  
22 this process and a consideration of the alternatives  
23 or I would find it disconcerting if it were not  
24 included.

25 Thank you.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MS. D'ARRIGO: I am coming away with an  
2 even greater concern about depleted uranium than I had  
3 before. Also as usual I'm very concerned when  
4 proposed rules are going to come out that allow for  
5 clearance or deregulation on the low end and do  
6 appreciate the opportunity to meet people and talk  
7 about that.

8 I also feel like in reflecting to the  
9 Commission the responses from the meeting there aren't  
10 as many critics as there are and I just think the  
11 stakeholder balance is as usual a little skewed. So  
12 keep that in mind.

13 MR. KILLAR: I'd like to certainly thank  
14 the NRC for conducting the workshop. I believe that  
15 throughout the workshop the NRC did a commendable job  
16 of explaining the issue and providing clarity on the  
17 topics that were presented. I certainly like their  
18 openness to take into consideration the various  
19 aspects that were presented particularly as we talked  
20 about the issues which should be a rule versus which  
21 should in the guidance documents and I think that was  
22 very effective.

23 One of my major concerns with this is  
24 coming up with a definition of a unique and I think  
25 that was very well handled and I think that the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 potential path forward looks fairly positive from my  
2 perspective at least. So I think from my perspective  
3 it's been a very successful workshop.

4 MR. YEAGER: I appreciate the opportunity  
5 to attend the meeting. I'll defer the comments on  
6 behalf of South Carolina to Richard, but I do look  
7 forward to facilitating contact between the  
8 appropriate folks to get CRCPD and most of those folks  
9 are also members of the OAS. So hopefully we can get  
10 further interaction between states that have  
11 experience and can bring that to bear as far as  
12 assisting in the process.

13 MR. HAYNES: I would say thank you to NRC  
14 for providing the conference. I also want to make  
15 sure that Chip and Priya get praise for setting this  
16 up and handling it, too.

17 Just to go on the record for South  
18 Carolina, we still support the site-specific PA and  
19 also would strongly encourage the time period that is  
20 the performance assessment be clearly outlined whether  
21 it's rule or in the guidance.

22 Thanks.

23 MS. GELLES: Thank you. I was waiting to  
24 be called upon.

25 (Off the record comments.)

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 I first want to say that I very much  
2 enjoyed being a part of this workshop. So thank you  
3 very much for the invitation. I'm honored to  
4 represent the Department of Energy and hopefully it is  
5 obvious now after two days of me beating this horse  
6 that the Department of Energy applauds the NRC's  
7 efforts to move towards a risk-informed, graded  
8 approach, one that relies on site-specific performance  
9 assessments and establishing a system that maintains  
10 those and revisits them in an iterative process.

11 And to that end we look forward to  
12 continuing to participate in this dialogue. I was  
13 very impressed by the other members here on this  
14 roundtable. I learned a lot and as a generator of DU  
15 waste forms and I do use the plural it's important to  
16 us that the ambiguities that exist right now do get  
17 addressed. I do think there are a diversity of  
18 perspectives on the matter, but I want to emphasize  
19 the point that my colleague Greg made and that's that  
20 there are waste forms that exist today that require  
21 disposal and I think that that's an important reality  
22 that we have to keep in mind as we move forward.

23 Again, I want to thank Chip for an  
24 excellent facilitation and Priya and Patty and the  
25 rest of your staff, Larry, for the help and the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 information that they've prepared so that this could  
2 be a successful workshop. Thank you.

3 I don't think Bill has anything to say.

4 (Laughter.)

5 FACILITATOR CAMERON: Or you could have  
6 said, "Here's one person who doesn't need an  
7 invitation."

8 MR. DORNSIFE: Well, I guess I can say I  
9 appreciate your indulgence of my comments as part of  
10 the meeting and I, too, express my appreciations for  
11 NRC putting this together. I think it was extremely  
12 useful.

13 I do have a substantive comment and  
14 question though. Coming to this meeting, my biggest  
15 concern with this whole concept was period of  
16 performance and I'd like to know what the NRC staff  
17 has taken away from this discussion regarding period  
18 of performance and what are their thoughts of how  
19 they're going to deal with it based on that  
20 discussion.

21 FACILITATOR CAMERON: Do you want to  
22 handle that?

23 MR. CAMPER: Yes, that's a great question,  
24 a fair question, and then, Dave, please follow. I'll  
25 give you my perspective.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 First of all, at the moment, we are open  
2 on this topic. I mean we have to go back and do a lot  
3 of review of what we've heard here. Obviously, we  
4 need to go have the meeting in Utah and get their  
5 perspectives out there. So, at the moment, we've not  
6 reached a conclusion.

7 From my vantage point, I made it a point  
8 yesterday to ask a specific question because I was  
9 looking for something we could take away. I mean we  
10 got into what I thought was an extremely interesting  
11 discussion about period of performance. There was a  
12 great deal of dialogue about the complexity of a  
13 period of performance, the variables to be considered,  
14 and so forth and so on.

15 It was at what I thought at an appropriate  
16 point in our discussion I asked two questions. One  
17 was should the period of performance be specified in  
18 the regulation as opposed to guidance. Generally, the  
19 impression that I came away from the panel was yes.

20 And the second question I cited our NUREG-  
21 1573 which talks about 10,000 years as a period of  
22 performance for our regulatory decision making with  
23 evaluation of consequences of long-lived isotopes in  
24 the environmental impact statement. Generally, the  
25 sense I got from the panel was that that was a

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 reasonable thing to do.

2 So from my vantage point again with the  
3 qualifier that we've not reached any conclusions nor  
4 will we until such time as we finish the workshops and  
5 communicate further to the Commission and so forth, my  
6 sense was they gave the staff something good to work  
7 with to think more diligently about. I was pleased.

8 And what I always look for are these kinds  
9 of things because there's always a great deal of  
10 intellectualism and dialogue that goes on. I'm always  
11 looking for a critical junction from a process  
12 standpoint. Does the staff have something that it can  
13 work with? Is there something that we can now go back  
14 further and put our hands around? I certainly felt  
15 that way at that point in the discussion.

16 Dave, would you add to that? Do you have  
17 any other views?

18 MR. ESH: No, I think I came into it being  
19 pretty open and I'm leaving being pretty open. I  
20 heard a lot of different ideas, a lot of different  
21 considerations, and it is an immense challenge and I  
22 think the best we can do is assess collective opinion  
23 of this group as well as the international community,  
24 consider our other regulatory precedence and programs  
25 and put all that together and see what we come up

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 with.

2 I think at a minimum what comes out of  
3 that it's going to be clear. You're going to  
4 understand it. Some of you may not agree with it.  
5 But I can't make everyone happy when there's different  
6 opinions. But that will at a minimum it's going to be  
7 clear. You'll understand it and it will be well  
8 thought out and it will reflect all the opinions that  
9 I heard in this workshop.

10 FACILITATOR CAMERON: Tom.

11 MR. MAGETTE: I, too, would like to thank  
12 the NRC for hosting the workshop. I think you did a  
13 good job. I think it was well planned, well managed.

14 I applaud Chip for his incredible patience and  
15 diligence. Thank you very much. I appreciate the  
16 input from all the panelists. I think the exchanges  
17 were very helpful, too. All and all I think it was  
18 very productive.

19 I would like to just reiterate my view. I  
20 think the proposed process is the right way to go. I  
21 like what's happening. I think the rule should be  
22 kept as simple as possible and I think it really  
23 should do little besides state the requirement for the  
24 performance assessment and state the period of  
25 performance and I think also the notion of an intruder

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 dose that's in guidance belongs in the regulations.

2 So I think everything else that we've  
3 discussed is a matter for guidance and I'm glad to  
4 hear what David has to say about his expectation that  
5 it's going to be simple and straightforward. That's  
6 kind of what I expect because I don't really see that  
7 there's a need for anything else. But I would just  
8 like to emphasize that that would be what I would  
9 expect to see and would want to see. Thank you for the  
10 opportunity to be a part of this.

11 FACILITATOR CAMERON: And thank you, Tom.

12 Larry is going to close us out, but I just wanted to  
13 thank all of you for your enthusiastic participation.

14 It makes the meeting really fun and -- well, I don't  
15 know really fun but -- I'm sorry.

16 (Laughter.)

17 Makes the meeting worthwhile. So I thank  
18 you for that and thank all the NRC staff who did a lot  
19 of preparation for this meeting and you've met a lot  
20 of them through the presentations. But people like  
21 Leah and Brooke back there did a lot to help and Priya  
22 was just amazing to pull all this together for us.

23 (Applause.)

24 And we now have two mascots from the  
25 Montgomery County Police. We love you guys.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 (Applause.)

2 Thank you for being here and thank you for  
3 being interested in what this was all about, too.  
4 That was great. That was fantastic.

5 And thank you to the attorneys. We should  
6 not leave them out of this. They've been with them  
7 all the way.

8 Larry.

9 MR. DORNSIFE: Can I have a quick  
10 question?

11 FACILITATOR CAMERON: Sure. Are we  
12 surprised?

13 MR. DORNSIFE: Some of us are going to be  
14 also involved in the Salt Lake meeting. Is the NRC  
15 planning on making any kind of comments at that  
16 meeting about this meeting and how do you feel about  
17 us relating discussions from this meeting to those  
18 folks?

19 MR. CAMPER: Yes, we would certainly  
20 provide some summary overview of what transpired here.  
21 Yes, we do need to -- I mean I don't know if the  
22 transcripts of the meeting will be available by then.  
23 I don't know.

24 FACILITATOR CAMERON: It will be.

25 MR. CAMPER: They will be. So the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 transcripts will be out there. We'll probably do  
2 something between now and then to make people aware  
3 that those transcripts exist and how to get to them  
4 and that type of thing. We certainly will provide  
5 some feedback on what transpired here. Yes, we would  
6 do that.

7 FACILITATOR CAMERON: And I don't think  
8 that we're going to be able to constrain you from  
9 doing whatever you want to do.

10 MR. DORNSIFE: You're in Utah again.

11 FACILITATOR CAMERON: And Tom is never  
12 going to get the last word on this. But I don't want  
13 to make the people who are coming to this Salt Lake  
14 City workshop feel like this has all been discussed  
15 and this is stale. So whatever we can do to maintain  
16 that freshness and vitality out there is important.

17 Christine.

18 MS. GELLES: I certainly appreciate that  
19 there is a need to leave open the possibility of a  
20 good fruitful discussion in Utah and maybe some new  
21 ideas and perspectives. But to the extent that we  
22 reached very quick consensus on some of the key issues  
23 -- and I'm thinking of things like defining  
24 significant quantities, defining unique waste streams  
25 -- I would hate to see us particularly since some of

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 the same people will be at the table spend another  
2 hour and a half having the same conversation over  
3 again.

4 So to the extent that you could summarize  
5 where there was a very strong sense of consensus but  
6 present it in a way that does not constrain continued  
7 discussion I would encourage you to think about  
8 whether or not that's possible.

9 MR. CAMPER: Yes, that's a good thing.

10 FACILITATOR CAMERON: I think that's a  
11 good suggestion. It can be done in a way that  
12 wouldn't cut out discussion of it, but we may be able  
13 to give more time to other parts of the agenda by  
14 indicating that. So that's something that we have to  
15 talk about, Priya.

16 Thanks, Christine.

17 Tom, did you --

18 MR. MAGETTE: I agree with Christine.

19 FACILITATOR CAMERON: Okay. That sounded  
20 like the last word in the Dornsife-Magette -- I don't  
21 know what to characterize it as. And thank all of you  
22 in the audience.

23 Larry.

24 MR. CAMPER: All right. Thank you, Chip.

25 Let me continue the thanks that I've

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 heard. I want to thank the staff not only for the  
2 work that went into preparing for this workshop, but  
3 this is an issue that the staff has wrestled with,  
4 worked on, now for two years or so. I must tell you  
5 that looking back to all the many, many discussions  
6 that I had with the staff on this issue along the way  
7 the open dialogue that we had, the airing of strongly  
8 held views and in-depth discussions of the technical  
9 analysis throughout the process, the staff worked hard  
10 on this issue.

11 It was a pleasure frankly for me to be in  
12 these numerous meetings with them and recognize the  
13 talent that I was surrounded by as we dealt with this  
14 issue. It was at all times animated and lively and  
15 intellectual and frankly gratifying. So long before  
16 this meeting, the staff put a tremendous amount of  
17 work into this issue and I thank them for it.

18 In terms of the meeting itself, Priya and  
19 Dave and Karen and everyone on the staff that touched  
20 this issue, a tremendous amount of work goes into  
21 preparing for a workshop like this and I am very  
22 grateful to the staff for this effort all along the  
23 way and in preparing for this workshop.

24 The panelists, I mean, what can I say?  
25 How would I begin to compliment you for your input,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 your varied views, your challenging commentary, your  
2 suggestions at how to procedure? All of it has just  
3 been an extremely valuable part of this process. Your  
4 expertise. Your experience. And, yes, the diversity  
5 of your views. You can't overstate that. A terribly  
6 important part of the process. And this rulemaking  
7 effort will be better for it because of this workshop.

8 I want to thank the audience. There were  
9 a number of interesting comments and questions raised  
10 by the audience. It's not easy to sit out there for a  
11 couple of days and you have thoughts and views on  
12 things, too, and you've been very, very patient and at  
13 times you offered commentaries. We appreciate that.

14 Chip, as always, you're masterful. You're  
15 just very good at what you do. I've heard a number of  
16 the panelists commend you on the way in which you've  
17 handled this forum and I would only echo that. It's  
18 really been a pleasure to work with you in that  
19 regard.

20 Along the way, I mean this question of an  
21 EA or EIS and what it should be. If one turns and  
22 looks at NUREG-1748 which is our guidance document on  
23 conducting environmental assessments, you'll find some  
24 criteria listed there. If any one of those criteria  
25 are tripped, it moves you toward environmental impact

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 statement. This is a very complex issue. I just  
2 don't want to prejudge where we go. The process will  
3 dictate where we go. But look at the criteria in  
4 1748. It's pretty self-explanatory.

5 This is a challenging issue. There are  
6 today approximately 700,000 metric tons of depleted  
7 uranium that need to be disposed of. There will be  
8 more depleted uranium coming down the pike in the  
9 future presuming that these facilities are in fact  
10 licensed. This is a challenging national issue. This  
11 is a terribly important and complex topic that we're  
12 wrestling with here.

13 This is the beginning of a regulatory  
14 effort to address that. The Commission has directed  
15 that we do this rulemaking as well as a risk informing  
16 of the waste classification scheme.

17 And I think on that note I would probably  
18 leave you with what I'll call one final basic message.

19 It goes like this. The NRC realizes the initial  
20 assumption made during the development of the Part 61  
21 waste classification table that all radionuclides not  
22 listed on the tables by default or Class A could be  
23 viewed as a faulty approach.

24 It was arguably erroneous to consider that  
25 the waste streams considered in the Part 61 Draft

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 Environmental Impact Statement were sufficiently  
2 comprehensive such that a new waste stream, i.e.,  
3 large quantities of depleted uranium, would not arise  
4 in the future and be subject to this default  
5 classification. In order to correct this problem, the  
6 NRC plans and is undertaking its normal stakeholder  
7 process and do a formal rulemaking addressing  
8 stakeholder concerns and evaluating technical and  
9 legislative factors associated with its safe disposal  
10 of large quantities of depleted uranium. The NRC  
11 believes this is the most prudent course to address  
12 the existing waste classification issues associated  
13 with depleted uranium and ensure that there is  
14 adequate protection to the public health and safety.

15 The Commission has directed the staff to  
16 do that in two parts, with limited rulemaking which  
17 has been the subject of this particular workshop and  
18 later look at the risk-informing waste classification  
19 in Part 61. So we've embarked on a long journey, but  
20 that's why we're doing it.

21 Let's subject this question of large  
22 quantities of depleted uranium to a process. I thank  
23 you for being a very important part of that.

24 FACILITATOR CAMERON: And when I talked to  
25 Larry about the closing I said, "Just don't be

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 provocative" and he said, "What does that mean?" And  
2 I said, "Well, don't say anything that causes someone  
3 to put their name tent up."

4 (Laughter.)

5 Okay. But Mike has something different.  
6 So you succeeded there.

7 MR. RYAN: Actually, it's a different  
8 item, Larry. You did a great job at closing.

9 Mr. Morrison who has transcribed many,  
10 many meetings that I've been at at the ACRS and the  
11 ACNW is getting married this weekend. So I think we  
12 owe him a round of applause for a great job and for  
13 his upcoming wedding.

14 (Applause.)

15 PARTICIPANT: Take the rest of the day off.

16 (Laughter.)

17 FACILITATOR CAMERON: And we want to see a  
18 transcript of the wedding.

19 MR. MAGETTE: And he's got a honeymoon in  
20 Salt Lake City.

21 (Laughter.)

22 FACILITATOR CAMERON: Off the record.

23 (Whereupon, at 5:14 p.m., the above-  
24 entitled matter was concluded.)

25

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701