Official Transcript of Proceedings

NUCLEAR REGULATORY COMMISSION

Title: 10 CFR Part 61: Site-Specific Analysis for Demonstrating Compliance with Subpart C Performance Objectives

Docket Number: (n/a)

Location: Rockville, Maryland

Date: Wednesday, May 18, 2011

Work Order No.: NRC-896 Pages 1-200

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

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

+ + + + +

PUBLIC MEETING ON PROPOSED RULEMAKING

+ + + + +

10 CFR PART 61: SITE-SPECIFIC ANALYSIS FOR DEMONSTRATING COMPLIANCE WITH SUBPART C PERFORMANCE OBJECTIVES

+ + + + +

WEDNESDAY, MAY 18, 2011

+ + + + +

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

SPEAKERS:

GEORGE SMITH, NRC/Region I, Co-Facilitator

BRETT LESLIE, NRC/NMSS, Co-Facilitator

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

ANDREW CARRERA, NRC/DILR

DAVID ESH, NRC/FSME, Division of Waste Management and Environmental Protection

PRIYA YADAV, NRC/FSME, Project Manager, Division of Waste Management and Environmental Protection

ATTENDEES:

MICHELLE ALBERT, NRC/OGC

SARAH ANDERSON, FM Pubs

JERRY BONANNO, NEI*

ANNA BRADFORD, NRC

WARD BRUNKOW, URENCO

TISON CAMPBELL, NRC/OGC

JAMES DANNA, NRC/DILR

GINGER DICKERT, Savannah River Remediation

WILLIAM DORNSIFE, Waste Control Specialists

LISA EDWARDS, EPRI

THOMAS ENGLAND, DOE Savannah River

ELIZABETH FORNASH, DOE*

JOHN GREEVES, JTG Associates

CHRIS GROSSMAN, NRC/FSME*

DEBBIE JACKSON, NRC/DILR

RICH JAVATI, Pennsylvania Department of Environmental Protection*

SUSAN JENKINS, State of South Carolina*

JIM KENNEDY, NRC/FSME

MICHAEL KLEBE, State of Illinois*

MICHAEL LEE, NRC/FSME

LISA LONDON, NRC/OGC

RUSTY LUNDBERG, Utah Division of Radiation Control*

THOMAS MAGETTE, Energy Solutions

ATTENDEES: (cont.)

ANDREW MAUER, NEI

SEAN McCANDLESS, Energy Solutions

DAVID McINTYRE, NRC/PAO

CHRIS McKENNEY, NRC/FSME

JUAN MONTESINOS, NRC/DILR

COREY MYERS, Studsvik Inc.

MAUREEN O'DELL, DOE*

DREW PERSINKO/ NRC/FSME

LISA PHILLIPS, DOE

EDWARD REGNIER, DOE

MARTIN SCHNEIDER, FM Pubs

DAN SCHULTHEISZ, EPA*

ROGER SEITZ, Savannah River National Laboratory*

DAN SHRUM, Energy Solutions

DANNY SMITH, DOE*

GREGORY SUBER, NRC/FSME*

LINDA SUTTORA, DOE

REBECCA TADESSE, NRC

JEAN TREHAFAEL, NRC/FSME

LIZ WOODRUFF, Snake River Alliance*

*Present via telephone

A G E N D A

P R O C E E D I N G S

(8:35 a.m.)

MR. SMITH: Good morning, everyone. I'm George Smith from US NRC in King of Prussia Region I. I'd like to welcome everyone to the 10 CFR Part 61 public meeting for the proposed rule text revision.

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

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

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

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

MR. SMITH: Okay. Thank you very much.

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

actually hear us.

(Telephone introductions off-mic.)

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

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

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

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

So, before we go on, we do have some

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

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

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

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

MR. SMITH: Okay.

DR. LESLIE: Okay. Good enough.

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

(Whereupon, the proceedings went off the

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

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

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

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

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

Again, the ground rules are mainly to aid in the meeting in order -- we hope to enhance the meeting. The first rule, respect for our participants. And, basically, we like for all participants in a meeting to be able to get their point out, allow the

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

We have five initiatives going on today in the low-level waste arena that touch Part 61. We have an assignment before us now from the Commission to risk-inform the waste classification tables in Section 61.55. This is an assignment that came out of the Staff Requirement Memorandum that was associated with SECY-08-0147, which was what we refer to as the Depleted Uranium Paper. That initiative is currently underway. I'll touch upon it just a little bit later in some of my remarks.

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

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

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

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

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

In terms of the meeting today, it's an

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

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

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

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

changes that result from this meeting today.

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

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

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

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

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

But these are the opportunities that you see regarding the site-specific rulemaking analysis, excuse me, the rulemaking requiring a site-specific analysis, the subject of today's discussion, the concentration averaging Branch Technical Position (BTP), the Volume Reduction Policy Statement, and the SECY-10-0165 which is looking at possible revisions to Part 61.

For those of you who are listening in, you can't see the dates. We apologize for that. We certainly will put this information out there and make it publicly available. But identify several dates, seven different times when there's opportunities for public input.

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

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

So, with that, I'll stop and do you want me to entertain any clarification questions, or do you

want to proceed? Any questions of clarification? Lovely. Welcome.

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

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

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

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

As Larry touched on, the landscape for low-level waste today is significantly different than it was when the initial Part 61 was developed. These are two of the major changes.

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

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

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

The Commission recognized that the landscape is significantly changing, so they issued a couple of directions for us to really look at existing

regulations, and evaluate what we need to do. So, during the Louisiana Energy Services (LES) hearings for the National Enrichment Facility, they directed staff to look at the depleted uranium issue, and just consider whether these large quantities warrant amending Part 61. Next slide.

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

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

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

The Commission directed us through Staff Requirements Memorandums how to proceed on these two

issues. On the DU front, they directed us to proceed with a rulemaking to require a site-specific analysis to demonstrate meeting performance objectives prior to disposal of large quantities of DU. They directed the staff to specify the criteria for the site-specific analysis, and also to issue supporting guidance that will assist licensees and Agreement State regulators in both performing these performance assessments, and reviewing these performance assessments.

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

To implement the direction in the Staff Requirements Memorandums (SRMs), we've had some recent activities. I think a lot of you participated in some of these activities. In 2009, we had two workshops, one in Bethesda, and one in Salt Lake City. And we had roundtable discussions at each workshop that had a variety of stakeholders. We had viewpoints from generators like DOE and LES, from disposal facility operators like Energy Solutions and Waste Control

Specialists (or WCS). We had Agreement State regulators from Texas, and Washington, and South Carolina. We had professors from universities, and we had public interest groups that participated, and we really got a range of good discussion on a variety of technical topics. Period of performance was one of them. We also talked about radon generation. And that was really our first input from all of you guys that gave us a lot of feedback that helped us kick off these rulemaking efforts that you'll see today.

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

We heard one or two requests at the 2009 workshops, and these kind of drove our next two recent activities. We had a request to issue some guidance before we could issue our complete draft guidance document, so we issued interim guidance in April 2010, which was a letter, in the form of a letter to Agreement States summarizing existing guidance that is

relevant in reviewing performance assessments.

And then a second request that we got at the workshops was to have more information on the screening model that we included in our DU SECY Paper, so Dave Esh and Chris Grossman led a public workshop in June 2010 where participants got to ask more questions on how to use the Goldsim computer code, and details of the screening model that we used. Next slide, please.

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

So, the regulatory -- sorry, next slide. The Regulatory Basis has a few proposed changes, I'm just going to quickly go over. The first two are to revise the performance objectives. So, the first change to the performance objective is to fix -- amend

Section 61.41 to require licensees to conduct a site-specific performance assessment prior to disposal of all waste streams. And the analysis would be used to identify if certain waste streams need to be restricted or prohibited at specific sites.

The second change of the Regulatory Basis identified is to modify Section 61.42 to specifically require conducting an intruder assessment at the end of a period of active institutional controls.

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

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

The last thing I want to touch on is the guidance document that we're working on in conjunction with this proposed rule language. We plan -- we're working on a document right now. We plan to be

finished around mid-October to November time frame, so sometime this fall we'll have it approved for public comment.

We will issue it in the Federal Register, in a different Federal Register than the proposed rule, and it will have its own comment period. And we see this guidance document as supplementing existing guidance, so currently we have guidance in NUREG-1573, which are the recommendations of the Performance Assessment Working Group. And then, also, we have NUREG-1854, which provides guidance for performance assessment related to waste determinations.

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

So, that's kind of just my summary of how

we got to where we are today. And then I can turn it over to Andy now.

MR. SMITH: I just want to announce that the webinar is up. And I'll provide the participation code again. It's 546376344. And for those who have just joined the call, just called in, I'm George Smith. I'm one of the Co-Facilitators for the meeting today. And, again, someone else just called in. The webinar information is 546376344. And we ask those who called in to make sure that your local bridge is on mute.

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

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

Today, we'll be providing you an overview of the Part 61 preliminary proposed rule language. As previously mentioned, the purpose of today's meeting is to inform the stakeholders of the current status of

the proposed rulemaking, and to invite stakeholders' comments, or ask clarifying questions to formulate your written comments on the preliminary proposed rule language.

I'd like to reiterate that the NRC will review and consider any comments received today. However, the NRC will not formally respond or commit to any comments. The Statements of Consideration of the proposed rule may briefly discuss any substantial changes made to the proposed rule language as a result of comments received on this preliminary version today. Next slide, please.

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

So, the rulemaking team proceeded to move forward in developing the objective and purposes of

the rule to specify site-specific analysis requirements to demonstrate compliance with performance objectives in Part 61; and to strengthen and clarify existing regulation to facilitate implementation and to better align requirements with the current health and safety standards. Next slide, please.

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

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

But numbers of these waste stream have become candidates, as Priya has mentioned before, for disposal at low-level waste disposal facilities. And

the amendment proposed in this rulemaking will require licensees to consider this new waste stream, and will continue to insure that Part 61 performance objectives are met.

The rulemaking team considered a number of options in developing this proposed rule. In the end, the rulemaking team decided that an amendment that requires additional site-specific analysis for all of the radionuclides that were not considered in the development of Part 61 would be the most comprehensive approach; and, hence, it's a waste stream neutral approach.

The site-specific analysis, the NRC also proposed amendment to Part 61 that would require low-level waste disposal facilities to conduct site-specific analysis to demonstrate compliance with performance objectives in Part 61, which would enhance safe disposal of low-level waste. And these analyses will also identify any additional measures that would be prudent to implement. And the site-specific analysis performance assessment would be added to Section 61.41, Intruder Assessment, which will be added to Section 61.42, a new long-term analysis requirement which would be added to a new proposed Section 61.13(e), an updated analysis at facility

closure which would be revised and added to Sections 61.28 and 61.52.

In addition, the NRC proposed other amendments to current Part 61 regulations to reduce ambiguity, facilitate implementation, and to better align requirements for the current health and safety standards. These include new definition and concepts, as well as the use of total effective dose equivalent or TEDE. Next slide, please.

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

In site-specific analysis performance assessment, Part 61 currently requires the licensee and license applicants to prepare an analysis to demonstrate that low-level waste disposal facility

meets the requirement in Section 61.41, which insures the protection of general population from the releases of radioactivity.

This analysis is called Technical Analysis instead of a performance assessment, and does not contain period of performance associated with the analysis. And the current Section 61.41 exists as a single paragraph, and the proposed rule would split the section into two subparagraphs, A and B. Specific requirements for performance assessment would be added to Subparagraph A, and specification for period of performance to estimate peak annual dose up to 20,000 years would be added to Subparagraph B. This Subparagraph B are new text, and 25 millirem total effective dose would be new text in this case, as well. Next slide, please.

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

Unlike requirements in Section 61.41, which addresses protection of general population from releases of radioactivity, no specific dose limit is set in the performance objectives for technical

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

The current Section 61.42, also it's a single paragraph, and the proposed rule would split the paragraph into two subsections, A and B. And specific requirement for a license refer intruder assessment with annual dose limit of 500 millirem TEDE would be added to Subparagraph A. And this would be new language right here. And specification for a period of performance to estimate peak annual dose up to 20,000 years would be added to Subparagraph B. And Subparagraph B are all new text. Next slide, please.

Also, intruder assessment, we also are recommending that the proposed rule would require intruder assessments for Section 61.55(a)(6) waste, as well. And the last sentence of this Section 61.55(a)(6) waste paragraph are new text. Next slide, please.

Site-specific analysis and long-term analysis. The NRC has determined that it would be prudent to require additional long-term analysis to insure that the waste streams significantly different from those considered in Part 61 Technical Basis can

be disposed of while still meeting the Subpart C performance objectives.

The proposed long-term analysis, which will be added to an all new Section 61.13(e)(1) and (e)(2), will consider uncertainties associated with the disposal of long-lived low-level waste streams, and is needed to determine whether limitation on the disposal of the waste streams at certain sites may be needed to properly manage the disposal.

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

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

In the current, Sections 61.28 and 61.52 do not have requirement for updated site-specific

analysis. The updated site-specific analysis requirement is needed to provide greater assurance of compliance with performance objectives of Subpart C, and to enhance the safe disposal of low-level waste.

The updated site-specific analysis would allow a regulatory agency to determine whether site and design meets Subpart C performance objectives. And the new text in 61.28(a)(2) would be the last -- part of the last sentence. And 61.52(a)(12) would be an all new subparagraph. Next slide, please.

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

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

Section 61.7 - Concepts. Other supporting changes also include providing clarification to the current concept of disposal facility. New language to Section 61.7(a)(1) was added to affirm the alternative methods of disposal can be approved on a case-by-case

basis, and meet it. And that's conveyed in the last sentence of the proposed Section 61.7(a). Next slide, please.

Also in Section 61.7 Concepts, new section, Section 61.7(b) was added to convey the concept of performance assessment. Subparagraph 1 captures the features, events, and processes that can improve the function of the waste disposal facility. And Subparagraph 2 captures key technical parameters to be evaluated in a performance assessment. And these are new proposed text. Next slide, please.

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

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

Section 61.7(c)(7), this is a new

paragraph, and it was added to convey the concept of intruder assessment, and captures key technical parameters to be evaluated in this assessment. And, like I mentioned, it's all new text, as well. Next slide, please.

Other supporting changes to Section 61.13 would include additional information to Paragraph A on the technical analysis of performance assessment that captures key technical parameters to be evaluated in a performance assessment. And previously, we do have 61.13(a); however, these new text were added to that section, and the old text would be started from here. Next slide, please.

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

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

The stakeholders will also have another opportunity to comment on this proposed rule language

when it's formally published as a proposed rule in accordance with the provisions of the Administrative Procedure Act. And the NRC will formally respond to any of those comments in a Statement of Consideration in the final rule. And the next step would be the final rule, which would take about a year after publication of a proposed rule.

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

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

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

The terminology, there's different terminology that's been used, the period of

performance, time of compliance, compliance period, performance period, it's all kind of used interchangeably in the literature. I'm going to use period of performance, but in the end when we get to our recommendation I'll explain what we mean by different phases of the approach we're recommending. Next slide, please.

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

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

In the U.S., different approaches are used, and also internationally. Right now, all of our

commercial low-level waste disposal occurs in Agreement States. The regulation does not specify a period of performance, so there's flexibility in interpreting what period of performance, or compliance period you should assign in the analysis.

We have very diverse views among stakeholders, both within NRC and external to NRC. I went back to the transcripts that we had from the meetings in 2009, and tried to classify the views that were expressed in there, and they truly are very diverse. They span a very broad range.

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

Some background from NRC. We have talked about this subject within NRC, and some of our stakeholders since as early as 1994. Originally, most of that discussion was done in the context of our high-level waste program. Our Advisory Committee on

Nuclear Waste discussed the period of performance on numerous occasions for what you may do for high-level waste.

Remember around that time, the National Academy of Sciences was looking at the issue, and they -- a report from them came out, so there was kind of a heightened period of activity around period of performance. And they, basically, said for geologic disposal, you don't have a strong reason for cutting off the period of performance at some period of time, such as 10,000 years that was proposed at the time. There's no reason why for a geologic system that has some inherent stability to it you can't evaluate longer periods of time.

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

The Commission has given us direction, as far as I can tell, only in SRM-96-103, where at the

time we had a Performance Assessment Working Group referenced in the bottom bullet that was looking at this issue, and also providing overall guidance on how to do performance assessment for low-level waste disposal. And they had discussed a 10,000-year period for period of performance, or a 10,000-year compliance period.

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

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

They did note that there are some things that would stress that position, and one of those

things was something like large quantities of uranium, or depleted uranium, because it has characteristics that are a little different, or a lot different than traditional low-level waste.

So, what they ended up recommending for that type of a material was to consider those long-term impacts, but to put them in something like a Site Environmental Assessment, where they can be better judged in the overall context of the problem. Next slide, please.

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

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

It's one thing to say well, we're going to evaluate our low-level waste, and we have a compliance period, but if there are things that extend out beyond that compliance period, I think it's important to communicate what those impacts may be to the best of your ability to your stakeholders. And there's no reason why this decision making process has to be easy. You know, the decision makers might have uncertain information, and they might have information that's a little challenging to communicate to their stakeholders, but there's no reason it has to be easy.

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

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

And I think the IAEA (international Atomic Energy Agency) takes this approach in their definition

of a safety case. The safety case has many elements to it, of which one of it is this technical analysis that you perform. So, don't get lost in the weeds that the performance assessment is telling me to do X, Y, and Z, and the criteria, especially the period of compliance, is the bottom line to whether I can do this or not. It's not. It's information that you're generating for the process that the decision makers should use. Next slide, please.

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

The characteristics of the waste, which in the case of low-level waste, and I'll show on the next slide, is very diverse. And that creates a challenge. The analysis framework is an important component, so in low-level waste disposal it's not just how you've selected and defined the period of performance, but how that fits into your overall framework for insuring

safety. And there are many elements to that framework for insuring safety, from site characterization, to monitoring, to institutional control of the facility. It has many elements, not just a technical analysis of the projected future impacts.

Uncertainties, I think, are very important to talk about. In performance assessment space, or technical analysis space, we generally focus on the middle two here, natural and engineering. But there are also over long periods of time these other two sources of uncertainty, societal and technology. And I have a conceptual figure I'll talk about in a few slides here that just tries to get you thinking about all these sources of uncertainty, and how they may affect your problem.

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

One thing that we hear when we've discussed this with stakeholders is, some stakeholders will express the opinion well, uncertainties are so large you should pick a short compliance period. And, for me, that argument doesn't fly. I mean, if you

think about in your life and risks that you may have in your life, I doubt that you're saying I'm going to take Action X because I have large uncertainty, or I'm going to take a risk because I have uncertainty.

In most cases, you want to reduce the uncertainty, and make sure that you can manage that risk. And, in this case, we also have to remember where we are. Low-level waste is at the top of the waste management pyramid or spectrum. Material that can't safely be disposed of as low-level waste has other options. They can be disposed of in a facility that would take greater-than-Class C waste, or high-level waste if those facilities, hopefully, get developed some day.

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

So, some waste characteristics. It's important, but it's only one element to the problem. If we look at the figure on the left, we have activity

ratio of traditional commercial low-level waste, and this was using some data from Barnwell. And then we have the activity ratio of, in this case, depleted uranium, or one type of waste that may stress the system.

Commercial low-level waste, the activity drops off very rapidly, and by 1,000 years, you maybe have a few tenths of a percent of the activity remaining. For something like depleted uranium, concentrated depleted uranium, the activity ratio stays pretty flat with what you put in, and then you get the daughters coming in at much later times, and activity doesn't peak until after a million years.

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

very later times?

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

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

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

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

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

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

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

Once you get over that, okay, we have built what we intended to, over the short time of tens to maybe a few hundreds, depending on the engineered system, we have an experience-base, and I'd say

relatively well understood degradation mechanisms that our uncertainty, or relative uncertainty, I think, goes down to some extent. But as you extend out into longer time frames, we maybe have some analogs for some engineered systems, but we're really getting into limited to no experience-base when you extend beyond 1,000 years, or many thousand years for how the engineered systems may behave.

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

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

But as you move out beyond 1,000 years, especially tens of thousands of years, now you're

talking about natural cycling of climate, landform evolution, surface geological processes, uncertainties start increasing, and may become very large at some sites. And then when you go out to very long periods of time, you're talking about extreme natural events, mountain uplift, and volcanic activity, and all the things of building continents, and even something like say meteorite impact. That becomes a real risk, and a real uncertainty when you go out to -- when you're starting to talk about hundreds of thousands of years.

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

That, if you are trying to say well,

what's the impact of radon to a future generation? Well, it wasn't even identified 100 years ago, and how big of a risk is it to people 200 years from now? If you look at how the technology has changed over just 100 years with identifying it, mitigating it, it's been a dramatic effect.

I think that you can't rely on how technology is going to evolve, but this technology -- the impact of technology, and how that impacts life is real. So, if you say well, technology may evolve -- technology may become stagnant, or we may go through a period where society decays, and technology decreases. Well, then you're in a situation where the relative impact from waste disposal starts being affected by, or when you consider it to the magnitude of the other things that are going on, it decreases in significance. And I'll talk about that in a slide or two here. Next slide, please.

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

NRC hasn't formally adopted these

variables, but in the Period of Performance paper, we modified them slightly, and stated something that we think is reasonable to consider for low-level waste.

These principles, some of them may seem straightforward, but when you go to implement and develop, say regulatory criteria, they're not at all straightforward. So, take like Item 3. "Each generation has a primary obligation to provide for the needs of the living and succeeding generations, and near-term concrete hazards have priority over long-term hypothetical hazards."

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

And then there's also the Law of Unintended Consequences can apply for these types of

problems. So, some things that you may do in the near term that benefit the near term, or that you may do to try to mitigate something over the long term can have an unintended consequence on a different or succeeding generation.

So, the bottom line is that I think when you take these principles, and you try to extrapolate them, or interpolate them into a policy, it is not straightforward, and there are complicated considerations that come into play.

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

If you include -- if you consider discounting over very long periods of time for, say, waste disposal, what that would mean is that you should spend very little today to protect the future generations. The opportunity cost of those resources that you spend today, they're taken away from some other action that can have a direct impact on society. So, money is not free, and it's not unlimited, and when you're talking about long-term impacts, you have to think about well, how does this cost or burden that

I'm imposing today translate into how a future generation may want to use those resources?

We do acknowledge that discounting is based on some unstated economic assumptions that may not apply over very long periods of time. But, as I talked about earlier, when you're in that situation and you say well, we can have a period of time where the discount rate goes negative for a long period of time; well, society is having big problems if that happens. And the risk that they're faced with -- a risk that we're faced with today, saying trying to manage low-level waste disposal can get swamped by some of the other risks that society will be faced with in that situation. So, there's kind of a natural negative feedback built into a consideration of discounting for waste disposal. Next slide, please.

So, options that we considered. We considered four options, or five options, I'm sorry. We started with no change from the current approach, so that would be the period of performance is undefined in the regulation. The second option we considered was peak dose, whenever that may occur. The third option that we had was a regulatory precedent, and I'll describe that as two tiers. And what that means is, two different parts to the

evaluation that have different expectations or criteria applied to them.

Now, I think you could maybe say that both number one and number two are a one-tier approach, so no change. You do a compliance period. You stop, don't worry about what happens after the compliance period. I'd say that's a one-tier analyses. You just have one tier to it. Peak dose, same thing. It's just the tier is a lot longer. The tier is, you include everything in the evaluation.

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

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

Now, selection of period of performance is fairly or very subjective, but we wanted to try to, at least, be a little more objective about how we would evaluate these options, and what we would recommend. So, we developed some rating factors to try to rank

the various options, and recommend one of them.

The rating factors that we developed were protectiveness of public health and safety, consistency with inter-generational principles, consistency with current NRC policy, treatment of uncertainty, and then facilitate regulatory decision making. And those are -- the order of them is somewhat significant. The protectiveness of public health and safety is given higher weight than, say facilitate regulatory decision making. Like I said earlier, there's no reason that the decision has to be easy, but we do need to make sure that we believe public health and safety is provided. Next slide, please.

So, the rating factors for the various options, and how we assigned a value to them, or range of values. Some of them we felt we couldn't justify just a single value. So, if we take like the current approach, Option 1, facilitate regulatory decision making, that could be low to high depending on how you define your compliance period. Some compliance periods, if you set it very short, you could say well, that facilitates my regulatory decision making, because it may make the problems seem to be easier. Or if I set it very, very long, I could introduce a

lot of technical challenges that people may not have information to deal with, and that could make regulatory decision making more difficult.

(Background noise.)

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

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

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

We felt it provided the best balance considering all the factors, and the stakeholders views at the current time. We also talked about what -- Option 4, the compliance assessment and performance approach, or a three-tiered approach. And if we say

right now we're completely flexible, and the period of performance is undefined, and then we go to something like an Option 4, which has three tiers, and you'd have to specify the boundary of each tier, and the limit for each tier, that's a big change. That's a lot of detail that maybe we aren't ready for. But we'll get your feedback on it, and hear from our stakeholders.

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

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

The first tier is a compliance period of no less than 20,000 years with a peak annual dose of 25 millirem TEDE. The second tier is okay, what do you do with this after 20,000 year effects, if there are

any? Well, what we recommend is a requirement to perform a calculation of the peak annual dose that occurs after 20,000 years as an indicator of long-term performance, but no dose limit would apply to this analyses. We also recommend a requirement to provide analyses that demonstrate how the facility was designed to mitigate long-term impacts.

This approach is in very strong agreement with what was recommended by the ACNW (Advisory Committee on Nuclear Waste) that expressed principles of how you would go about setting a time of compliance, or period of performance for low-level waste disposal. And they were very concerned that you were -- for the long-term impacts, and say things that we're including in tier two, that it doesn't become a de facto compliance period, because you're maybe kidding yourself, and you're maybe -- could be considered to be misleading for some of your stakeholders if you're trying to argue that you have proof of what the number is at those very long times. The best you can probably do is say, here's what I expect to happen, here are some alternatives, here are the range of impacts that I can expect over those times.

Decision maker gets that information, and

decides okay, is this a good decision to make, or not? And I think what we've expressed with our two-tier approach, a second tier would provide transparency of information. And, ultimately, we really want to insure that stakeholders are given transparency of the information if the long-term impacts apply in a particular application.

As I said, most sites and most facilities aren't going to be in this boat, but some of them may. The ones that are in this boat, we want transparency of information. And as I'll show on the next, let's see, three, four slides from now, we're still providing some flexibility.

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

The performance assessment should be used to identify both, can I dispose of certain material, and what are my limitations? So, the performance assessment can identify what I can't take, and that's an important input to the decision makers and the stakeholders. And it may be that your performance

assessment can be used to identify, I need to set some limitations on what I can take. That would be an appropriate use of a performance assessment, especially for the long-term impacts. Next slide, please.

So, what is the basis for our 20,000 years? Well, we looked at a number of different things. One of the primary things we looked at is stability. So, in Part 61, it says, "A cornerstone of disposal is stability," and we agree with that totally. Near-surface disposal, as you go out in time, you start running into some very strong stability issues. And they're much more challenging than, say, for geologic disposal.

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

Well, in both of those cases, they looked at geologic disposal, and they made the argument that if those sites are stable for 10,000 years, they're likely to be stable for much longer. So, a 10,000-year period, if it's consistent with the waste

characteristics, is sufficient for the geologic disposal system.

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

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

A big part of that cycling of climate is determined by planetary motion, so precession of the earth, and rotation, and movement of the planets around the sun, and there's a pretty strong like 100,000-year period that changes our climate, and then a shorter period within that also affects the climate. And right now, we're in the middle of the warm stage. It started anywhere from 10,000 to 12,000 to 14,000 years ago, something like that.

One of our concerns was that if we specified a 10,000-year period of performance for low-level waste, we'd be right in this transition period. And that doesn't seem to make much sense. Either you should go shorter, or you should go longer, but it doesn't make much sense to be in this period -- that you could be in this period of significant transition.

So, what we ultimately decided was to include this climate cycling within the compliance period, because that will encourage disposal of long-lived waste at more stable sites. And, for us, the regulation states very clearly stability is a cornerstone of disposal.

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

You can, potentially, make the argument, or you can make the argument that when you're at 20,000 years, you're at least within an order of magnitude of the waste characteristics for uranium.

You have to consider loss from the system. It's not just a matter of radiological accounting of where the isotopes are, it's more complicated than that. But you can argue that you're within an order of magnitude for depleted uranium.

And what I would submit for you to think about is, what are the order of magnitude effects that you're going to be dealing with at tens or hundreds of thousands of years? A one order of magnitude effect maybe in the noise of some of the other things that you have to consider. So, should you base your decision for low-level waste disposal overall on one type of waste that's going to go into that system with one particular set of characteristics?

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

So, a value of 20,000 years better captures radionuclide transport characteristics, too, compared to 10,000 years. And there is some diminishing returns for longer periods. You start getting into this increasing uncertainty, and although I said uncertainty is not a reason to take action, what I think that people are trying to convey when they say the uncertainties are so large, are not that the uncertainty of waste disposal is so large, but the uncertainty of everything else that's going to happen is enormous. So, how do you spend present dollars today to try to manage that risk and uncertainty given that context?

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

These risks that we're talking about over

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

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

So, when we looked at radionuclide transport characteristics in the period of performance, this chart looked at a range of depths for sites, shallow, moderate, deep, and some different climate conditions, and probably classified, okay, if I wanted to change between, say, 10,000 and 20,000 years, or 20,000 and 50,000 years, how does it impact my results? And what you see is that for strongly absorbing radionuclides, they may be affected at one

type of site, so the zirconium, thorium, cesium, only at shallow human sites, or those where you would have the highest transport would you expect that they're going to be impacted by changing between 10,000, 20,000, and 50,000 years. Otherwise, they show up after that period of time.

At the other end of the spectrum, you have things that are more mobile, especially like technetium, tritium, and chlorine. And I apologize, in the Period of Performance paper I noticed when I was preparing this presentation, these were put in the wrong box of the table. They're down here in humid deep, but I looked at it, and that was you test. If you didn't catch that, you failed the test. So, I looked at it and I was like that can't be right. Right? Because you look at the other radionuclides, and they're all in bands here, so you have plutonium, actinium, cobalt, I forget what Pa is. You have a group of radionuclides here that are generally affected under more mobile conditions, so humid, semi-arid, shallow, or maybe moderate and humid. And then you have some that are affected at, say, shallow arid, or humid deep, or semi-arid moderate, and then you have a class of radionuclides that are affected by moderate arid, and so forth, and so on. But it didn't

make sense that these were down in this box. If they were down in the deep humid box, they should have been the whole way across the diagonal, and they weren't. So, we'll correct that in the paper.

But the transport characteristics said, okay, there is a benefit for us going longer, but that benefit diminishes, and we described that. When we go to 20,000 years, we have more confidence that we're going to capture some of these moderately transporting radionuclides. When we go to 50,000 years, you capture a few more, but not a lot more. So, there's a benefit, a big benefit to going -- or a moderate benefit to going to 20,000 years, but limited additional benefit to going to 50. Next slide, please.

Now, something that I've spent a lot of energy on, and tried to convey to people is this no dose limit for the second-tier. And I think this is a more important consideration, in my professional opinion, than the boundary for the compliance period. So, what do you do with these impacts over the long term, and how you consider them?

We believe that this approach of not specifying a dose limit for the second tier can better place those in the proper context. So, when I was

talking about your risk of things happening to you in the context that this problem is in, it's a real world context. It's not a hypothetical radiation-only context, but it's a real world context.

You can place them in the proper context. How we would do that, NRC, if we had a facility that we were licensing, and it wasn't in an Agreement State, is we would complete an environmental analysis of the impacts for disposal, the disposal licensing actions taking place, and we would evaluate those longer term impacts in that context. In the Agreement States, they would have to use their own processes.

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

I saw some papers by different researchers that, basically, did intruder assessments of some of those facilities at some later time, and they argued that the risks approach one, not some fraction of 1E

to the minus 4, or 1E to the minus 3, but those risks can become very large. So, why are we treating nuclear things different than non-nuclear things?

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

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

So, important for some of you, and maybe most important is our guidance on the period of performance, which you don't have yet, but you will have in the fall. And what we've done in this area is, we have developed what we would call risk-informed, performance-based guidance on the period of performance. And this would allow some flexibility, because we're sensitive to okay, if I'm not taking long-lived waste, or I'm only taking a little bit of long-lived waste, why should I be considered with climate change, and all the other things that might affect my facility? That doesn't make much sense. Is that a good use of resources? Is it gaining any protection of people?

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

And now the other thing that we've done is, we would allow to go longer for high concentrations of long-lived waste. We've heard this

from our Agreement States during our rulemaking process. So, the compatibility class of the compliance period is C, is that right, Andy? Yes, C, which allows somebody to go longer if they choose for the compliance period in an Agreement State. But it says up to 20,000 years, so you'd have this flexibility for the short-lived waste, or low concentrations of long-lived waste, but if you have high concentrations of long-lived waste, you have to do at least up to 20,000 years, and your Agreement State could make that longer.

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

I think that's it. We'll have time to discuss these this afternoon. There are some backup slides that have a number of excerpts from various ACNW letters and things. I think they're very illuminating of where we started, and where we are now. So, I tried to give you those so that you'd know

the context of what we are working on. Thank you.

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

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

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

We're going to go over a couple sort of administrative ground rule issues that we talked about earlier. First of all, those on the line, the meeting is getting transcribed.

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

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

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

MR. SMITH: Thank you, Elizabeth.

Who else is on the line?

MR. LUNDBERG: Rusty Lundberg, with the

Utah Division of Radiation Control.

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

MR. SMITH: One moment, please.

Okay, thank you, Rusty, thank you.

MR. JANATI: Rich Janati, Pennsylvania DEP.

MR. SMITH: Thank you.

Is there anyone else?

MR. KLEBE: Michael Klebe, State of Illinois.

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

MR. SMITH: Michael Klebe, State of Illinois.

MR. SMITH: Thank you, Michael.

Is there anyone else who dialed in?

(Pause.)

Going once --

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

MR. SMITH: Yes, please.

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

MR. SMITH: Thank you, Roger.

MS. WOODRUFF: And this is Liz Woodruff

from the Snake River Alliance in Boise, Idaho.

MR. SMITH: Thank you, Liz.

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

MR. SMITH: Thank you, Maureen.

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

MR. SMITH: Thank you, Danny.

Is there anyone else who's dialed in? We'd like to get your name to get it transcribed.

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

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

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

We have those who have dialed in, and I also have the webinar. We want to give everyone an

opportunity to be heard by providing their comments, and to get those comments captured.

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

Cell phones, again, thank you, I didn't hear any cell phones, though, but please keep them in courtesy mode. If you went during the break and used your cell phone, make sure it's in a courtesy mode, i.e. either on vibrate or silent mode. We do have a parking lot here that will capture information that we may need to go back and address.

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

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

The first comment will be from John Greeves.

Oh, I'm sorry, John.

(Inaudible off-the-record comments.)

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

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

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

So, since I only have five minutes, let me quickly say, you did a good job. 85 percent of what you've done is really good, it's consistent with comments that Jim Liebermann (phonetic), so I congratulate you.

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

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

The rule language in about three spots could be improved if it would recognize that

reasonably foreseeable, site-specific scenarios, they aren't mentioned, and it's, having done this for over 30 years, it's very important to have this concept of reasonable foreseeable scenarios. The Commission has done in a number of places, I can't give you the citations now. Maybe I will on the written format.

But there's three different --

(Inaudible off-the-record comments.)

PARTICIPANT: This is better. We can hear now, thanks.

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

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

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

And there was a third spot. They're going to humor me. Other concepts, it talks about engages

in activities that unknowingly expose the intruder -- well, again, reasonable foreseeable activities.

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

The second point is a concept of, you're requiring -- a number of places to do with performance assessment, intruder analysis, it doesn't matter what you call it, but I think that the concept of when you do that, and demonstrate those performance objectives are satisfied, that the disposal requirements that are tied to the generic, non-site-specific classification tables, they should be deferred to waste acceptance criteria generated from this new performance assessment.

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

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

MR. GREEVES: That the rule requires, and I agree, site-specific performance assessment and intruder analysis, and if you demonstrate those

performance objectives are satisfied, that the disposal requirements tied to the tables, those tables are generic. They're not site-specific. There's a lot of debate about the tables, and you're going to do further work on them.

In the meantime, if an Applicant and a regulator review that performance assessment and find it acceptable, then the resulting waste acceptance criteria should be allowed to override those tables. It's effectively what DOE does.

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

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

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

The number you indicate in your paper, it's a policy call. Truly, it really is a policy call, and you give very good -- five options to consider, how to make the call on what the number is, and protectiveness, two of which are consistency, treatment of uncertainty, facilitation of decision-

making. These are the -- I align with those principles.

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

Well, it's created more than confusion, it's created a lot of consternation in some quadrants. I'm not sure you're going to hear about it all here today, maybe later, but you selected these evaluation criteria, two which are consistency, and then somehow, you selected 20,000 years, which is inconsistent with what the Commission has done for decades.

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

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

I'll tell you which one is my preference. Maybe I'll decide that by June 18th, but being consistent with the past practice is what I individually would recommend, not coming up with some new number that nobody else has used and is going to

create -- it can undermine some of the credibility out there, coming up with these new numbers. So that's my input, and we can talk more about that this afternoon.

MR. SMITH: Good. Thank you, John.

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

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

DR. LESLIE: Hey George, as you're picking out the next person to speak, John brought up a good point.

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

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

Go ahead.

MR. SMITH: Okay, good. Thank you.

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

We'll go to Thomas Magette.

MR. MAGETTE: Thank you. I'm Tom Magette. I'm with Energy Solutions. It's a little difficult to separate out the period of performance question and comments on that from some of the other aspects of the proposed rule, because I would presume that they drive one another.

So I'll make a brief comment there, but I'll try to reserve some of it for this afternoon, because I certainly wouldn't want to pass up another opportunity to comment.

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

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

However, when we start boxing in what that

information has to be and calculating numbers and comparing them to dose standards, then we take discretion away from the decision-maker.

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

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

Another comment I would make in regards to the language regarding the inadvertent intruder, I believe that you have taken a deterministic rule and suggested changes under the umbrella of making it more risk-informed, but my comment about the intruder would be that it's even more deterministic and not at all risk-informed.

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

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

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

And ASLB (Atomic Safety Licensing Board) accepted that, and the Commission accepted that and wrote an order where they explicitly accepted that, not just glossed over it. So the Commission itself has said that that is an okay conclusion.

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

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

(Inaudible off-the-record comments.)

Okay, well, I would like to make another general comment about this, which is that I believe

that this has become a uranium rule.

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

I appreciate your comment that you made about guidance regarding the POP, and if someone chooses not to deal with some of these wastes, then they will have the -- well, the opportunity not to have to do the performance assessment and the intruder analysis that are described in here.

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

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

MR. SMITH: Thank you, Tom.

Dan Shrum?

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

(Laughter.)

I'm just kidding.

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

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

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

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

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

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

MR. SHRUM: Again, I see that in there, but the "up to" is still going to be problematic,

because the people who don't want to do the work that we do are just going to say, it says 20,000 years. So, that's just -- that's one of the issues.

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

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

And the last issue is on the last page of the rule, under Section 61.55, 55, I believe it was Section 61.55 (a)(6). I'm not quite sure if some of those got cut off.

And it just states that any waste classified under the subparagraph must be analyzed in the intruder assessment required by Section 61.42. We're wondering, these are wastes that are not in the table, and do we not have to do a performance assessment also, or just an intruder assessment, if

that's required?

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

MR. SMITH: Okay, thank you.

William Dornsife? Is it Dornsife? Thank you.

MR. DORNSIFE: I'm Bill Dornsife with Waste Control Specialists, and my most burning comment was the last thing that was mentioned, that this thing was going to be compatibility C.

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

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

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

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

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

In protection of inadvertent intruders, I don't see any justification of the 500 millirem. What is the reason for choosing 500 millirem, other than it's a carryover from the earlier Part 61 EIS?

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

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

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

But if you start varying some of the

parameters, you, in fact, get some huge doses, right outside of 20,000 years from the water pathway at certain sites.

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

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

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

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

PARTICIPANT: I can't hear anything.

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

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

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

(Pause.)

Okay. That's just inconsistent.

MR. SMITH: Thank you.

MR. MCKENNEY: Hi. I'm Chris McKenney. One point that I think we didn't clarify well enough as far as this meeting was, a lot of the information that, well, one that Bill has just talked about, along with -- usually, when you normally see rule text or a proposed rule, you see the statement --

PARTICIPANT: Will the commenter please speak up?

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

PARTICIPANT: We can't hear anything.

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

MR. MCKENNEY: Okay, this is Chris McKenney from NRC. Is it, in this stage of a draft proposed rule text, we don't have the statements of

consideration that go with it which would define a lot of the discussion on some of where some of these other numbers came from, and some of the other discussions of the basis.

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

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

DR. LESLIE: Larry, did you have something to add?

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

You talked about the 500 millirem number. You're right that there's a historical basis, of course, going back to the original environmental impact statement for Part 61.

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

Are you suggesting that the number is too

high, or too low?

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

MR. CAMPER: Thanks.

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

DR. LESLIE: I'd just like to remind everyone that this microphone, for the people on the bridge line, has to be like this close, an inch away or less.

Sorry, Lisa.

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

I'm just kidding. Never mind.

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

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

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

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

And if you already foresee the need to include kind of points of consideration or maybe there could be additional language added that said something along the lines of the performance assessment would be required for those waste streams, dominated by nuclides that have a half-life exceeding – et cetera.

But for typical waste streams that are not dominated by such nuclides, it would not be required. It could be performed, but it wouldn't necessarily be required.

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

To do a dose calculation, you need two really important components to be known. The first is, the activity, and the second is the dose pathway,

which implies a receptor.

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

Your ability to produce a defensible dose pathway, however, comes into question. If you resort to what I call the fencepost dose calculation, which means your intruder or receptor is right there on the site, 24/7, 365 days a year, and subject to the very most restrictive or worst case scenario for exposure. That is bounding.

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

So I would challenge the group, what the credibility in a risk-informed regulation are requiring a dose calculation where you cannot

reasonably identify a receptor is.

Am I already past five minutes?

MR. SMITH: You have about a minute left.

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

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

I am confused by a regulation that introduces a probability of intrusion of one and the probability of the worst-case intrusion of one being used in a regulation that needs to be risk-informed.

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

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

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

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

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

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

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

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

MR. SMITH: Okay. Thank you, Liz.

MS. WOODRUFF: First, thank you to the NRC for providing this opportunity for stakeholders in affected areas like Idaho to comment on this ruling, which we appreciate the opportunity to have our voice heard.

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

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

That's not to say that there hasn't been a

very clear attempt to deal with some of those inadequacies in the language, and I'll address that below, but we believe that deep geological repository is the best location for these waste streams, and that especially in relation to depleted uranium, this rule is simply inadequate in addressing the characteristics, the long-lived characteristics of that waste stream, and that that results in a rule that is pretty confusing, and ends up giving some vague language for pretty serious issues, and it just kind of leaves us confused.

In the definitions in the Section 61.2 definitions, I think that there's a disconnect between the long-lived aspects of the waste stream and the conversation in number one about institutional controls.

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

Then, moving on to the concept section, in number 2, excuse me, let's see, yes, number 1, numeral -- or excuse me, letter A, we don't believe that near-surface is good enough. Again, we believe that a deep

geological repository should be looked at.

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

This also applies to the paragraph mentioned earlier by another gentleman about the effective life of an intruder barrier. So why is the 500-year time frame used?

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

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

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

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

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

I think that that is really good language, and I appreciate that it's there, although I think it needs to be clearer what that means.

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

And in number seven, "the intruder assessment must identify the intruder barriers and examine the performance barriers. The intruder assessment must also address the affects of uncertainty on the performance of the barriers," again, I think that's good, but that's an

impossibility at the sites that are being looked at for near-surface disposal, and again, what I'm talking about in terms of vague language.

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

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

Real quickly, on Section 61.12, specific technical information and the technical analyses below, I think that this language about the performance assessment of the site, identifying characteristics of, I guess, in numeral A, I think this explicitly should and will ultimately exclude energy solutions, and that was talked about the DU working group in Utah, the characteristics of that site and the longer time frames.

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

MR. SMITH: Okay. Thank you, Liz.

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

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

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

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

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

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

MS. EDWARDS: This is kind of a new concept that I'm going to put out for brainstorming for your group to consider, and it's a follow-on to what Bill Dornsife recently commented on just a few minutes ago.

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

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

The first one is EPA 400, which relates to

the dose limits associated with the need to evacuate people in a radiological emergency or under radiological release conditions.

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

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

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

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

I think if we adopted a concept of -- or a recognition that this is an accident, a possible accident and not an actual accident, and tried to help

weigh the limit associated with that with a higher dose limit, it takes into account or maybe helps balance a little bit some of the probability assumptions that you've made, or that we've made historically.

MR. SMITH: Is there anyone else?

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

The first one is in the new Section 61.7(c)(6), which is on the screen.

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

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

But in all that section, it seems -- this is, I think, similar to what John was saying, John Greeves, the section seems to imply that there's the use of a performance assessment and an intruder analysis to make up for shortcomings that are inherent in the tables as a result of having done a generic evaluation.

So, there's a, if you will, a way for there to be a higher standard to be met by something that's not specified in the table, because by virtue

of not having specified it, the components were not sufficiently restrictive.

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

If the generic tables have shortcomings that make them insufficiently protective, in some cases, it's equally true that they have shortcomings that make them overly conservative inc certain cases. So I would suggest that there are two sides to the question that is introduced in Section 61.7(c)(6).

The other comment I would make that the definition of -- the addition of the term "long-lived isotopes," which I think is part of the "uranium-ification" of the rule, if you will, has possibly led, or could lead, to an unintended consequence in that there are other waste packages that we get that have isotopes not listed in the tables that are long-lived, for example, transuranics, actinides.

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

There's nothing that suggests that there's

some sort of concentration, just a 10 percent activity reduction of less than 10 percent, is not sufficient, I don't think, to require an increased stability requirement for the large majority of existing waste that we accept.

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

The question I have has to do with the language at the end of Section 61.7(a), this, "alternate methods of disposal can be accepted." That's kind of Section 61.58-ish.

Is that your intention, that this is adding the flexibility that's currently invoked by Section 61.58, now under Section 61.7? And if not, what does it mean?

Thank you.

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

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

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

Any further comments? John?

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

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

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

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

Thank you, John.

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

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

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

So, again, I'm free to express mine and

another to hold me back.

DR. LESLIE: John Greeves, thanks for your comment.

MR. SMITH: Are there any more comments here?

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

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

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

It appears to me to be an attempt to deal somehow with the unique waste streams in one rule, rather than maybe separate out how you do performance assessments for, you know, the unique waste compared to the normal waste. It seems like a lot of the comments are kind of hitting at that issue.

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

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

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

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

MR. SMITH: Thank you for your comment.

Lisa?

MS. EDWARDS: I think of some of what Bill talked about gets at the crux of the matter. We know what's being generated in the United States, and presumably around the world. So it's out there, and it's being stored someplace.

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

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

If it is suitable for near-surface

disposal, then let's create a regulation that will clearly outline the objectives so that they can be met and demonstrated and not open the door to endless objections that, in effect, result in non-implementation of the rule.

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

If we haven't reached that conclusion, then I think we need to respond to some of the comments in the rule that I think what people are seeing here is that this type of rule, you'll never be able to get to the end point and successfully use the rule for disposal of the waste in near-surface disposal.

DR. LESLIE: Thank you, Lisa.

And Larry, you had a comment?

MR. CAMPER: Yes. Larry Camper.

Lisa, let me try to address your comment. Very good comment, thank you.

When the staff was given the initial assignment to address this question, there is a large quantity of depleted uranium coming out of the LES

here, the first question that the staff challenged itself with was whether or not large quantities of depleted uranium were suitable for near-surface disposal.

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

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

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

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

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

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

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

DR. LESLIE: Thank you, Larry.

MR. SMITH: Are there any -- we have one more comment. One more comment?

MR. DORNSIFE: Bill Dornsife, Waste Control Systems.

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

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

issue.

MR. SMITH: Thank you.

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

Lisa?

MS. EDWARDS: Lisa Edwards with EPRI.

Larry, kind of in response to the comments -- the information you provided, so what I see, what I'm a little concerned about is we have this unique waste steam and depleted uranium where activity builds in over time, which is different than most of the commercial low-level waste that is generated, which is really, per the vast majority of the waste, is at peak activity at the post of disposal. It only decays, more or less, with the majority of the radionuclides from thereon.

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

And those burdens aren't free. You know, it costs a lot of money to dispose of low-level waste. It affects the cost of our electricity, and people out there care about that.

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

DR. LESLIE: Thank you, Lisa.

I think Dave had a comment.

DR. ESH: Yes. This is Dave Esh from NRC. And I just want to add a clarification that -- as Larry's exactly right.

It's not just concentration, but it's quantity that can drive the risk. So, I find it hard to say, categorically deny or ban a certain class of material without bringing that idea into the conversation, because a disposal site may, through the analysis and decision-making process, you may determine it can take some quantity of material, and just because it's named a certain type of waste doesn't mean that it can't safely be taken.

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

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

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

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

Now, it's not the only waste stream that's different than anticipated. Right now, we're undergoing a reprocessing rulemaking that may generate materials that may be different in quantity and concentration than was anticipated back in the early `80s.

Likewise, blended wastes are different than what was envisioned when the Part 61 was done, because it was assumed in the waste classification tables that not all waste would be at the waste classification limits.

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

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

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

MR. SMITH: Thank you.

MR. MAGETTE: I think -- this is Tom Magette with Energy Solutions.

I think that's a good point, David, and I think within the NRC and outside the agency, a lot of people looked at the generic notion of a unique waste stream rule making as something that was an improvement rather than a one-off constantly, I'm beginning to wonder if maybe that is the case, because two of the three that you mentioned, the blended waste and the potential waste stream from reprocessing likely are not going to pose the kind of challenges -- well, certainly, in one case, doesn't, and in the

second case, could easily be limited so that it doesn't.

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

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

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

So it looks to me like we are looking at least one unique stream that requires some level of differentiation. And the more I read, the more I listen, the more I think about this, the more I see unintended consequences, potentially rising to the level of a problem like what Lisa just addressed, without repeating what she said.

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

Go ahead.

MR. DORNSIFE: This is Bill Dornsife, Waste Control Specialists.

You know, on the DU issue, one of the

analogies that you may want to look at is the amount of DU that's exempt from licensing.

Has NRC ever, you know, I mean, people can literally do whatever they want with exempt material. Now, luckily, most of the people that have counterweights that are used in aircraft at least send them to a RCRA facility for disposal of exempt materials.

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

MR. SMITH: Thank you.

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

Are there any more comments in the room?

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

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

(Whereupon, the above-entitled matter went

off the record at 11;43 a.m. and resumed at 1:02 p.m.)

DR. LESLIE: Good afternoon. This is Brett Leslie, the current facilitator for the meeting you've been attending. I want to welcome everyone back and I understand that the people on the line are really having difficultly hearing the commenters and so not only are you going to have more time but we're going to give you two options. You can come up and sit exactly where Priya is sitting and speak into that mic so long as you don't mind a hand on the shoulder when you get to your 10-minute limit, or you can come up and use the standing mic. Again we'll give you 10 minutes and if you don't mind us coming up and you'll - we'll have more than enough time I think this afternoon for everyone to do 10 minutes, go to the phone line and then come back for more comments. But these handheld mics, they literally almost have to be on your lips and that's not the most hygienic and certainly I don't think John Greeves appreciated me trying to stuff this microphone in his mouth. So kind of with that as a background, so even though we have the ground rules saying that we're using microphones, we're not going to try to use these handheld mics except for me, I'll use one and you've got the whole thing.

A couple of things. I would appreciate everyone's thoughtful input in the morning session. And George is not taking the afternoon off but he's going to be in the back helping me ensure people get up here and identify who's going to be commenting. Again, I'm going to go through the ground rules because I can't stress it enough. There are people on the bridge lines who are shuffling papers and having conversations and we can hear them, everyone can hear them. So if you're on a phone that doesn't have mute stop working unfortunately, stop shuffling papers. It's really distracting for us. And we'd like to have respect for all participants both on the phone line and here, and so we're trying to accommodate the people on the phone by requesting the people here to use better mics and so I'd just like to ask people on the phone to kind of respect the people here who are also trying to listen.

Stakeholder feedback. One of the things that we did talk about at the very beginning is we have meeting feedback forms. And so if you didn't pick one up earlier and you want to comment they're still out on the table. I have some here. We're also using the speaker comment cards and I'll - the way we'll run this afternoon's meeting is, again, we're

going to be focused not so much on the rule language but on the period of performance. And I'll start with the people here in the room and then we'll go to the people on the bridge. Before we get into the comment period I want to ask the people on the bridge to one by one identify themselves so I'm going to turn to the bridge and ask who's on the line.

MS. O'DELL: Maureen O'Dell.

DR. LESLIE: Thank you, Maureen. Who else? Is anyone else on the line?

MR. SEITZ: Roger Seitz.

MS. FORNASH: Elizabeth Fornash from DOE EM.

DR. LESLIE: So I heard Roger Seitz and someone from DOE.

MS. FORNASH: Elizabeth Fornash.

DR. LESLIE: Thank you, Elizabeth. Anyone else on the bridge line?

MS. TREHAFAEL: Jean Trehafael, NRC.

DR. LESLIE: Okay, Jean. Anyone else?

MR. KLEBE: Michael Klebe, state of Illinois.

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

MR. JANATI: Rich Janati, Pennsylvania

DEP.

DR. LESLIE: Is that Rich? Okay.

MR. JANATI: Yes.

DR. LESLIE: Anyone else?

MR. LUNDBERG: Rusty Lundberg, Utah.

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

MR. SCHULTHEISZ: Dan Schultheisz, EPA.

DR. LESLIE: Dan, thanks. Last time for people on the bridge, anyone else? Okay. So before we get started I think it's worthwhile thinking back to something that Larry said early on. Right now you have out in front of you some draft regulatory language and those documents are out there. There are written comments. Due date is June 18th. But one of the things Larry asked and I like the way he put it. If not 20,000 years, what and why. So that's one of the things that the staff really would like input on. So again, especially this is important for the period of performance discussion this afternoon. So I guess I'm going to ask if there's someone who wants to go first here in the room. Linda? And again, you can either stand up or sit down and we'll let you know if we can't hear you. Thank you, Linda. And don't forget to identify yourself for the record.

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

To begin, I note that my comments today do not constitute the official DOE position on the potential wording of rule changes. Instead what I'd like to do today is share with you DOE's approach to the same issues which we've developed and tested over a series of decades. DOE's approach is set forth in DOE Order 435.1 which is DOE's radioactive waste management order because DOE is self-regulating for radioactive waste. And the way DOE orders work is that the order itself says go forth and conquer in the manual. The DOE manual 435.1 actually provides the requirements. So you'll see I might actually mention DOE manual but actually they're essentially the same thing and they're both required.

In addition to the order and the manual we

also have guidance, and policies and practice. So you'll - several of our things that we do right now are not in the requirements but we do them because over time we've discovered they're important to do. And they're in one guidance document or another. And we in fact are currently in the process of updating our DOE order at the same time as 10 CFR 61 is being revised and we would like - we thought that this was a good opportunity to harmonize the regulations of our two agencies to bring about a more consistent and comprehensive national approach for regulating the nation's low-level waste disposal.

In kind of a risk-informed approach we agreed that a thorough and well-supported site-specific understanding of a disposal facility is key to assessing its safety. A performance assessment for all waste management - I'm sorry, for all waste streams to be disposed at a facility provides such an understanding. As you may know, DOE assesses and approves the use of DOE-owned low-level waste disposal facilities at a number of its sites across the country. The DOE process requires a site-specific performance assessment. The department has developed guidance and standard practice over many years as I mentioned before and in terms of developing the

bounding conditions and assumptions used in performance assessments. The DOE practice falls well within the range of approaches used currently in commercial facilities licensed by NRC's agreement states. So we have a number of key assumptions that are consistent across what you're proposing in preliminary deliberations that are consistent with the way DOE does things, such as a time of compliance. You're proposing a time of compliance a little bit longer than we currently use. The comparison of the projected facility performance against performance objectives, for DOE we use a 1,000-year period primarily in view of the uncertainties in long-term projections and their hypothetical nature. However, sensitivity and uncertainty analyses are conducted and the projected level in time of a maximum dose, the peak dose, is projected. This information enhances the understanding of a disposal facility and can also be useful in evaluating alternative disposal facilities that are otherwise equal.

Another assumption that we incorporate is point of compliance. The point of compliance normally corresponds to the highest point of projected dose or concentration beyond the buffer zone surrounding waste. This buffer zone is often 100 meters but it

may be more or less if justified by site-specific conditions, yet it never extends beyond the boundary of the land projected to be under permanent control by DOE. Another assumption is compliance demonstration. A performance assessment is a projection of reasonable, reasonably foreseeable future events. That's an important point, reasonably foreseeable future events. Proof of compliance cannot be attained in the normal sense of the word. We seek a reasonable expectation of future compliance taking into account the uncertainties inherent in projections over long time periods. In addition, DOE's performance assessments must include demonstrations that projected releases of radionuclides to the environment will be maintained as low as reasonably achievable, another important point.

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

Assessments regarding human activities, another important point mentioned this morning.

Projecting disposal facility performance and analyzing potential inadvertent intrusion entail consideration of the hypothetical future human, how they behave, what technologies or medical sciences will be at their disposal, and other societal factors are among the greatest uncertainties in long-term performance assessment. It's not reasonable or necessary to consider the most extreme bounding scenario. Rather, we consider a set of normal activities consistent with current local practices and conditions. For example, an example that is, Idaho site. When a well-digger drills into the ground to reach groundwater they don't - it's not unanticipated that they would hit rock so their well-digging equipment can anticipate that it's much stronger and they'll dig through. And if they hit a cement monolith like DOE has left underground at Idaho they will keep digging and so in our performance assessment we actually analyze the scenario of a human intruder digging through the cement monolith. However, South Carolina has very sandy, loose soil. Our intruder scenario does not anticipate that an inadvertent intruder would dig through a cement monolith it came across because current practices in that state are to move to the side until you don't hit rock. So those are the kinds of really site-specific

natural, local current practices that we incorporate into our performance assessments.

Another one is extrapolation to future environmental conditions. Performance assessment requires projections of natural processes and events. Over very long periods of time there are hypothetical events that may or may not occur or may be extremely unlikely. It's DOE's intent to analyze the reasonably expected behavior of a disposal system. Long-term calculations are based on a projection of current site conditions, including present rates of natural processes, allowing for variation in the processes and including episodic events such as flooding.

Another issue that we incorporate is the treatment of the radon dose in our PAs. We consider them separately. It's a normal radiological protection practice, consider radon and its decay products and air separately from the impact of other radionuclides. DOE applies performance measures to limit radon flux at the burial ground surface and to limit air concentrations offsite.

Yet another assumption we make is for unique waste streams. We take a performance-based approach. We conduct what we call special analyses. For those wastes that were not anticipated when the

original performance assessment was written for that specific disposal facility. DOE analyzes the unique waste stream's radioactive properties against the disposal facility's waste acceptance criteria and the bounding analyses provided in the facility's performance assessment to calculate whether placing that specific unique waste stream would impact the performance objectives of the performance assessment. We dispose of unique waste streams in facilities where there is no identified impact to the performance objectives.

And finally, and this is another issue that we think should be incorporated into Part 61 when it is revised, is the thought of performance assessment maintenance. DOE considers a performance assessment to be a living document. Each performance assessment includes a section describing research to be conducted over the course of the next year and out-years, and results of those research projects are used in assessing the continuing validity of assumptions in the performance assessment. We conduct an annual view of the performance assessment to determine whether any new information that has been developed over the past year is significant enough to question the validity of the current conditions and conclusions of the current

performance assessment. If there is a question, a revision to the performance assessment is performed and it is treated almost as a brand new performance assessment. It goes through the rigor and review of the DOE system for performance assessments. There are other triggers. It could, if we redesign facility disposal cells we can recognize that the current assumptions that were in the current performance assessment aren't valid anymore so we need to revise the performance assessment. And there's several other things, maybe site groundwater systems are better understood and we recognize that the PA doesn't work anymore. So we revise the performance assessment and we redo the entire analyses. And a subset of the performance objectives could - that we would just make sure that the performance objectives were never compromised.

Once the performance assessment is approved at the site level, this is another important point is the level of rigor at DOE. We start with the site produces it. Other folks on the site do a peer review of that. Once the peer review is complete at the DOE site it goes to the headquarters organization that is responsible for doing a national expert, technical expert review and we bring experts from

other DOE site, from industry and from academia to conduct an independent review prior to management approval. So the revisions to existing performance assessments trigger the same level as the initial performance assessment. So again I thank you, that's all I had to say. I appreciate being given the opportunity to speak today and I hope you consider the descriptions of the DOE processes helpful during the deliberations on your revisions of 10 CFR Part 61.

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

PARTICIPANT: Absolutely.

DR. LESLIE: Okay. So we'll keep that in mind. One comment on the agenda which I didn't talk about. Right now it's just slated for one long public comment period. I'm thinking that we might be done by 2:30 so if we're not done by 2:30 that's when we'll take a break. So we'll stay as long as people have comments because we need to hear what you have to say. Were there other people here in the room that wanted to make a comment? If you could raise your hand and then I'll. Lisa, do you want to? Lisa, I'll give you a choice. You can have it right next to your lips, sit at the table or stand up. And we'll give you 10 minutes. Thank you.

MS. EDWARDS: I appreciated your comment. I'd like to be able to ask you questions. How do you think that might apply for specific waste streams like the depleted uranium. But I do have a few general comments. In slide 7 in your presentation, Dave, in David Esh's presentation there's kind of a diagram there that shows the various activity levels that remain after a certain period of time. In general we proposed a 20,000-year performance assessment period, but when I look at the waste characteristics slide in slide 7, after year 1,000 until you get out to close to it looks to me 50,000 or 60,000 years I don't see that there's a substantial difference between 1,000 and 20,000 and the activity that is present in the site for either the depleted uranium waste stream or the lower activity - or shorter lived half-life waste. And for that reason I would propose consideration for 1,000 years instead of the 20,000 and that would also harmonize more closely with what the DOE has in place in their regulations which I think whenever we develop something that there's more consistency between how those same types of waste are treated by different organizations it removes some of the confusion that gets caused in the public sector.

Second, I want to just respond, David, to

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

I do think that if you're going to require a dose calculation for peak dose no matter what year it occurs and to be performed then I think you need to provide a context for the dose pathway assumptions. In other words, I'm going to reiterate some things that we talked about on the break. But for the record, when people are doing dose calculations they need to have a receptor pathway. And if you don't provide context of reasonable assumptions to include in those dose receptor pathways and you put it in a time frame that is so far out that you really have no

reasonable basis for prediction of behavior or use of the land 10,000 or 20,000 years from now, the only thing you can do is assume the worst case scenario.

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

So for instance, in a particular dose pathway surrounding a nuclear power plant, if you have a garden within the dose pathway for that plant you will assume worst case 100 percent consumption of the vegetables from that garden in your dose pathway. And if you want to use something less than that then you must provide a technical basis of why something less than that is reasonable.

In most cases that data can be gathered, but it can be burdensome to gather the data and have it be substantive enough to be defensible. So it goes into more detailed communication with those landowners to establish real land use criteria. It's done

realtime and it's updated typically quite frequently, as often as once a year. So when you look at a dose pathway that's 1,000 or 10,000 or 20,000 years away I don't see a clear pathway defining a realistic scenario for a dose pathway which means you'll revert to worst case scenarios. And when you combine that with already assuming a probability of 1 of intrusion. Did I say that before? That a probability of 1 of intrusion is hard to believe? Two, that the probability of intrusion at 100 years and one day is 1, and three, that you add in you're going to assume the worst case scenario. We're moving a long ways away from being risk-informed or realistic and credible in the scenarios that we're producing. That's all I'm going to say on that because I think I've maybe driven that point home more than once now, but I think it is very important.

The next point that I'd like to make is that there were some references about it's important to consider our social responsibility to future generations, and that in order to do that we need to look out to 10,000 or 20,000 years. And that I think some of the results may land us in a place where we orphan waste streams. And I would offer for the group's consideration that my perspective on

responsibility to the future generations is slightly different. I think the responsibility for future generations is responded to most effectively by not orphaning waste, providing a regulatory structure for responsible and safe disposal of waste, and not orphan any waste streams. Because 10,000 or 20,000 years from now the waste we've generated is going to be somewhere and the question is is do you provide a better environment for future generations if that waste is disposed of in a centralized and regulated disposal facility or if you leave it orphaned out in somewhere in the public. History has shown us that the events that we've had have come not associated with actual disposal of waste. It has come in situations where waste has been abandoned. And I think it is reasonable to draw a corollary to that that again, whatever limitations we may have in understanding what's going to happen 10,000 or 20,000 years now at a particular disposal site, it's at least as good and probably better than the scenarios you would imagine 10,000 or 20,000 years from now with orphan waste streams.

And finally, in the DU - original concept behind the DU rulemaking, my understanding was that it was a fairly limited scope rulemaking. What I've seen

put in the wording is that this is waste stream neutral which really implies a more or less comprehensive revision to Part 61 which includes new performance objectives and at least from the current wording could be interpreted as applying to all waste streams. And as such, I think that there is a requirement for a NEPA assessment or EIS to be performed before such regulation goes into place. And I just want clarification to understand that that is the expectation that a NEPA assessment or what I call an EIS would be performed before the rule is actually finalized.

DR. LESLIE: Great question, Lisa. Are you done?

MS. EDWARDS: I am.

MR. MCKENNEY: This is Chris McKenney. I'm chief, Performance Assessment Branch for NRC. First on the NEPA analysis. There is a NEPA analysis associated with the rule. Start over. Chris McKenney, Performance Assessments Branch of the Nuclear Regulatory Commission. The - on the NEPA question there will be a NEPA analysis with the proposed rule. Again, since it's preliminary, much like the statements of consideration every rule does go through a NEPA analysis. At this time we're

currently evaluating it through the steps of it did not require to start out with an environmental impact. So we evaluate through that system, but we are doing an environmental assessment on the rule. The - yes, there's a two-step process. Some things require large environmental impact statements AZimmediately; others go through an assessment that says do you do an environmental assessment. Right. Basically there's a way to check and see how big does your environmental assessment have to be.

The - on the first part is is that when you're talking about receptors and stuff like that, if you look at our current guidance in the area of both low-level waste, high-level waste - actually not both, there's three so it's several - and in decommissioning we look at average them as a critical group, we look at reasonable land uses in our guidance space which is one of the reasons why John Greeves brought up previously that he thought that to strengthen that would be to bring that into the text language actually. But we do not have as a first cut a person standing sucking up leachate and that sort of thing. Also, in our - similar to low-level waste reviews under our authorities under the National Defense or the Ronald Reagan Defense Act 3116 which we do some

monitoring of DOE activities we have definitely explored with that where we don't, again, make worst case assumptions for assessments of receptors during that entire analysis time period.

MS. EDWARDS: For intruders.

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

MS. EDWARDS: How could an intruder be in -

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

MS. EDWARDS: How is an intruder dose pathway anything less than worst case? You assume he drills down and encounters the waste and then - with the things that I've seen he stays with that waste 24/7 for the whole year.

MR. MCKENNEY: No, he doesn't. He - I'm saying that for his activities and other things like that we don't assume worst case. He doesn't sit on the waste, he doesn't do that 24/7. You don't have to go to that level of assumption of receptor activities. And so the - it's just not that worst - it's not the worst, worst, worst of everything in the assessments. You may be - and from one vision correct is a

statement that we do assume that to look at what would happen if an intruder happened at any time after institution of controls could be relied on, but beyond that. Our receptor of what human activities are in the future are largely based off of what are reasonable activities in the local area today.

DR. LESLIE: Thanks for going up to the first mic and answering that question.

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

DR. LESLIE: Sure. Absolutely.

DR. ESH: This is Dave Esh, NRC. As Chris indicated, defining the receptors and the characteristics of those receptors, we aren't assuming the worst case for all their behavior characteristics, consumption parameters, et cetera. So if they're envisioned to have a garden and grow vegetables, they'll have a local fraction and a non-local fraction, or if they're using water they may have some water from a local source and they may consume bottled water and other products that they get some of their fluids from. They'll have an onsite occupancy time and an offsite occupancy time where they're essentially getting no dose. So in the dose estimates that we do in waste disposal and decommissioning and

the types of programs Chris mentioned, it's not the worst case person you can envision.

We do generally believe that you need to consider the characteristics of the intruder and the characteristics of waste in defining your intruder in the intruder scenario, but the probability is not 1. The probability is 1 only if you were to apply the same dose limits to the intruder as you are to a member of the public. We are recommending in here and in the EIS that was originally done for Part 61, apply a 500mrem dose limit; that implies roughly a 5 percent probability of that intruder scenario happening by the difference in the dose limits. So consider that whenever you're thinking about intruders and the likelihood of the intruders, et cetera. We acknowledge that the intruder calculation is more dependent on the behavior of people and what they may be doing sometime in the future which is more difficult to define.

It's hard to define exactly what people are going to be doing and when they're going to be doing it, and so we err on a reasonably conservative approach for what we believe. Now if you think about right here where we're sitting and what was done here 200 years ago and 400 years ago, when we're talking

hundreds of years or thousands of years, the land use today is markedly different than the land use was 200 or 400 years ago. So if you're putting a disposal facility in someplace, one of our criteria are that you choose a low population area and you choose an area that has limited natural resources. We hope those things combined and the state ownership, federal ownership of a disposal facility; all those things combined contribute to greatly reducing the likelihood that this ever happens. But we can't ensure that it won't happen so we go through a regulatory process of trying to assess what happens if this unexpected or unlikely thing happens, this intruder scenario, and we apply a higher dose limit for it. That's the context for kind of the analysis under Section 61.42.

Regarding the slide 7 and the waste characteristics, I should have said this during my presentation but of course we have the log-log plot on the left and linear-linear on the right. They have different characteristics. And also, the risks that you get out of these calculations are not necessarily determined by the bulk activity. The risk can be driven by, say you have iodine-129 in the disposal facility. It's not going to show up as moving these activity curves anywhere, but that could be the driver

of the risk. So in performance assessments you're looking at the very few radionuclides and they have mobility and exit the facility, you're not seeing the risk from the bulk of the activity. So I don't want people to misinterpret the waste characteristic plot is what I'm saying. That represents the total activity in the facility, but the bulk of that activity may never cause risk. So when you start talking about risk and frameworks for analysis and those sorts of things, the waste characteristic charts can be misleading.

DR. LESLIE: Thanks for the clarification. Lisa, thanks for your comments. Bill and then John. Again, Bill you can sit down if you feel more comfortable sitting down or standing up. And again, 10 minutes thereabouts.

MR. DORNSIFE: I just want to elaborate on some of the points I made this morning regarding the 20,000-year performance time. I think it's a time that's trying to be all things to all waste streams and I don't think it applies to all waste streams. I mean, I think 95 percent of the waste streams or maybe even more, a 1,000-year performance period is quite satisfactory. Now, that doesn't mean you shouldn't be looking at peaks beyond that and what you do with

those peaks I think primarily is to establish possibly inventory limits where you judge that a peak is just so high that you know even though it's remotely possible and we don't understand what might be going on at that time it just makes good societal sense to do that.

Now in Texas we have a 1,000-year performance time but we have to look at peaks forever and our regulator applies the 25mrem dose in terms of establishing inventory limits. And not only that, but when they did their performance they assumed worst case, you know, when they look at sensitivity studies and parameters they assumed worst case. Where are those parameters? So just to give you an example of how one regulator approaches that. So you know, I think you know there needs to be some uniformity in how a lot of these things get implemented. I don't - certainly you know in our case it's certainly very conservative. From the standpoint of reality it just doesn't make sense.

So I think having said that, you know, you probably need to look at the two issues differently. You need to look at the long-lived radionuclides differently than you look at the 98 percent of the other waste streams because they do create a different

problem. Like I said previously you know, if you look at the toxicity in water of depleted uranium after 10,000 - 20,000 years, it's no different than high-level waste. I'm not saying that means it needs to be disposed of in a geological repository, but you need to look at it differently. You need to you know maybe do a longer-term performance assessment. You may look at some of the technical requirements for disposal of that unique waste stream. You know, it has to be a lot deeper, it has to have some specific type of engineered barriers. You know, what kind of technical additional redundancy might indeed provide that level of assurance just like it does for high-level waste.

And I think going on - the next issue would be the intruder issue. I mean I don't disagree with the way you all imply your intruder scenario. I think your discussion, Dave, I think made a lot of sense, particularly - and I like the clarification of why you're using 500 millirem. I just didn't see anywhere. That's a good justification. But I guess, and this may sound off the wall, but has NRC ever considered deliberate intrusion? I mean, I could probably reasonably expect that it's much more probable a hundred years from now when we have scarce resources that somebody's going to know there's a huge

chunk of metal down there, very high-quality metal, and they're going to want it. That probably has a higher probability than inadvertent intrusion. Now, you know, if that person who deliberately intrudes isn't properly controlled and there isn't knowledge he's doing that, just hold the ball game for that waste site. He goes in there and excavates a steam generator.

DR. ESH: And just for clarification, Bill, this is Dave Esh, NRC. In the original Part 61 the Commission basically said - I'll paraphrase, you can look at the Part 61 - that we don't protect or we aren't going to try to develop criteria for the advertent intruder. So somebody who deliberately is digging into a waste disposal facility and isn't supposed to be digging into a waste disposal facility, that's not something that we can speculate on exactly when, where, how it'll happen, nor do we have an obligation to try to develop criteria for that.

MR. DORNSIFE: I could make a very good argument that that's a higher probability, not only for low-level but also for high-level, for spent fuel. I think that when you look at changes in site characteristics, you know, for this - and I like the idea very much of requiring a performance assessment

not only for you know the public but also for intruders. I think that's - a site-specific performance assessment is extremely, extremely useful and needs to be done for any site or if you're making changes to waste streams that you intend to dispose of. And in fact, Linda, your idea of a performance assessment maintenance plan, we have a requirement to do that on our license. We had to submit our performance assessment maintenance plan which includes a yearly update of that performance assessment which allows us not only to look at new information that we have on site characteristics, but it also allows us to consider getting authority for new waste streams and determining that the waste streams we have disposed of based on the real data, the real inventory is in fact fine which brings me to another point and that is chlorine-36.

In our performance assessment, chlorine-36 by far and away is the most significant radionuclide in our performance assessment. It's still less than - well less than a millirem in terms of impact and the peak is somewhere around 15,000 years, but it's the highest dose and it's also the only radionuclide that peaks before 20,000 years. But the data that we were required to use to come up with that chlorine-36 waste

stream as best as we can determine went all the way back to the Part 61 EIS and it included some guidance that NRC put out. So that waste stream is so inflated that it doesn't have any reality to it. Now the problem is because it's not a class-defining radionuclide nobody looks for it. People only look in detail for those - or spend a lot of effort looking for those radionuclides that are class-defining. So I think, you're going to see on an arid site, you know, deep arid site chlorine is going to be the bad actor.

Now what we've done and we have - hasn't been approved yet, but we suggested or we proposed using actual reactor chemistry, you know, what is the allowable ppm of chlorine in your reactor coolant system and then calculating you know what a maximum inventory in resin could be because that's primarily where it shows up. But absent that, I mean there's no good way to get data because most data manifests say there's zero chlorine-36. Let's see.

I think that's - oh one more thing real quickly. I did, by the way, notice I skimmed through the technical thing and that table didn't make any sense to me either. I wasn't sure why but it didn't look good. So you can - I passed the test. You had

said when you were looking at the second tier where there's no dose limit that NRC would do an EA to come up with, you know, some criteria of what you did in terms of that. I mean, I'm not sure what you meant. What would be the scope of that EA, what would you look for?

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

MR. DORNSIFE: Okay.

DR. ESH: But it would look at the impacts that you may see at those later times just like any impacts that are generated from an action and assess them how they're done in the EA/EIS process. So it wouldn't be anything new or unique, but it would put the radiological impacts from disposal at those later times in the same context as other types of impacts that you evaluate in that process.

DR. LESLIE: Thanks for clarifying.

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

frame.

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

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

(Laughter)

MR. GREEVES: - there's linkage and to do compliance you've got to know what the scenario is. All of us have said that. So I'm hoping based on remarks made this morning and this afternoon by the Department of Energy that the staff sees there's a lot of folks looking for this reasonably foreseeable language in the rule. Don't - it's not going to work in guidance. You've got to give this in the rule. You need that in there. Chris McKenney stood up and said that's what we're doing under 31.16. I'm very familiar with that and the comment. I would agree, the staff has looked at realistic scenarios for the most part including the uncertainties and all the

parameters. So I urge you to pay attention to what DOE said, other stakeholders, and I would look forward to the next language to include reasonably foreseeable intruder scenarios.

The comment also is - I made this morning about using the PA to derive a waste acceptance criteria. Bill said it about Texas. They have a provision in there. We have to update that performance assessment and if there were inventory limits we're smarter now, we adjust, let something in the rule account for that. That waste acceptance criteria derived from the PA is what we're - more what you do in a site-specific way. It was interesting listening to DOE. And both approaches use a two-tier approach. I'm not sure whether everybody in the room understands that, but there is a two-tiered approach that you provided. DOE uses it. I would invite NRC and DOE to get together on what is the period of performance. They have a different number, you practice a different number, you now have a new number, 20,000 years and I see that as unsettling and I would ask both of the agencies to come together and look at what a period of performance for tier one is and seek alignment on that. I think it's just disruptive to have federal agencies in different

places on that.

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

I sort of have the microphone. I would speak to the agreement states. I know a little, only a little bit about they requested a meeting in the fall time frame to understand these issues. I would urge any agreement state to get on the record before the fall because the NRC staff's agenda has them putting out a proposed rulemaking in the fall. So if you've got a view on these issues, whether it be the reasonably foreseeable scenarios, the period of compliance, the intruder analysis approach, I think it's, just like DOE came forward this morning and said what they've had on this, I'd like to hear what the agreement states' recommendations are before the fall.

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

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

MR. MAGETTE: Thank you, I'm Tom Magette with Energy Solutions. I certainly agree with what John said about the quality of the exchange here and I appreciate the opportunity to be a part of this. I would like to start with a couple of general comments, the first of which is I'm having a hard time seeing the linkage between the language in the SRM for SECY 08-0147 and the SRM for the blending to this rulemaking package. Now, I didn't really expect I would see nothing more than a new paragraph 61.55(a)(9), thou shalt do a performance assessment, especially since as Dave had pointed out, you know, we ask for things like period of performance and intruder doses and updates to the performance objectives, dose methodology. So I knew it would be more than that but this is more than I thought I might see and frankly I am wondering what exactly more you might have to do to

this to have something that constitutes the comprehensive revision of Part 61 as Larry likes to talk about. And I would suggest that the comment John made and I made this morning about Section 61.7(c)(6), if you in fact looked at not just imposing additional requirements for what's done in the tables based on the generic assessment as insufficient, but expanded that on the other end to deriving site-specific WAC that if appropriate would even trump the tables, what's left to do. And I note from your own report looking at the options for comprehensive revision of Part 61 a large percentage of that effort is devoted to a big EIS that would replicate the waste stream analysis that was done 30 years ago. One might suggest that that's not something you ought to have to do if you're going to go to risk assess - a risk-informed performance assessment base. Why regenerate that huge volume of information, to what end? I'm not saying you wouldn't need an EIS, but I do think that's five or six FTEs that you could chop out and move on. So that's one comment. I think you're pretty close to a comprehensive revision and taking another step would get you there, and then you could save an entire rulemaking, always a good thing.

Second, as to compatibility criteria,

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

As to the time frame, I don't think 20,000 years is right as I said earlier. I think we should have some perspective here so I refer you to a slide prepared by one Dr. David Esh for the DU meetings. You can't see it back there but the last thing on here is 10,000 years out. So that's one perspective that we have is that we haven't certainly established any basis for a scientific analysis that goes out further than that, at least I haven't seen it. I find it interesting that here again you've called this the regulatory precedent option that's not like any precedent I'm aware of. In fact, it's probably more

like the number four in my view. But I also think that in your report you have the phrase "Just because a calculation can be performed or computer model parameters can be set to estimate results for longer periods of time does not necessarily mean that the results of the calculations have meaning." That's in your option 2 but I think it applies to 20,000 years. I think it applies earlier in time. I think you would see the same thing if you looked at what the NAS said about Yucca Mountain. Specifically posed a question by Congress about the meaning of scientific analyses beyond 10,000 years they said we can't do it. It can't be done. So there are lots of precedents hanging around 10,000 years. John talked about that.

I won't go to it anymore other than to make a couple of points that I don't really think you've established a technical basis. I understand the technical concept, the Ice Age and climate changes. I don't think you've made a justifiable correlation between 20,000 years and that approach. I think it's a big rounded off number. But I think most importantly what it does is it skews other analyses and it ties the decision-maker's hands. I briefly touched on that this morning. But the idea that you

want to analyze what you can effectively and not hide from the uncertainty or ignore it. I think David, you're right about human decision-making. We wouldn't ignore uncertainty, we'd probably be more conservative. But what we've I think done is when you take a number that's so far out in time and you crank out a number and you compare it with a performance objective, then you're telling the decision-maker what the answer is. You're not saying here's a range of unknown and here's a range of what might happen in that unknown time period that you should consider. Like the same arguments that revolve around the peak dose consideration whenever that might occur. I would suggest should be pulled back in time and that they're more appropriate in certainly no more than 10,000 years if even that. So I think that also has driven things like the intruder. I mean, the language about an intruder must occupy the site. That's new. You don't say an intruder must occupy it. If you say I have to justify an intruder barrier for 20,000 years, analyze the uncertainty of that, then you start - I think you start driving back to how you're requiring an intruder to occupy because it becomes impossible for us to make those calculations with any reliability. So I think Lisa' right. I think there's

a huge over-conservatism. But those are linked. One I believe drives the other. You're driven to a more conservative intruder approach because of what you can't say that you can eliminate if you're looking out 20,000 years. So here again, you're locking that into - for a performance objective dose comparison as opposed to in some sort of realm of decision-making which a decision-maker would have to consider but wouldn't be tied into.

Finally, you've asked if we don't like what you've proposed to give you what we do like. So what I will say to that is I like what DOE is doing. I think that the basis allows for consideration of these more extreme time frames and I think that that's a sound approach. You asked in your comment solicitation on the update to the concentration averaging BTP, what we thought about aligning multiple government organization approaches. I said in my letter that you might not achieve much by doing that and it's not necessarily an objective in and of itself. But in this case, if you think about the waste stream that we're most concerned with where is it coming from? It's coming from DOE. They own it all, all. Even if LES or AREVA or somebody else builds a new facility and produces it on the private

scale, the USEC Privatization Act still says they can just give it to DOE. It's DOE's waste. DOE's got a system that they apply at multiple sites where they dispose of waste streams like what we're talking about here more than anybody else ever has. So I think that's another reason to rely on their model. Decision-making flexibility, appropriate consideration of extreme time frames and a prime understanding of the generator of this waste stream. Thank you.

DR. LESLIE: Thank you very much, Tom. Is there anyone else who wanted to make comments here in Rockville? When you come up make sure you introduce yourself, especially since I've forgotten your name. Actually before you get started, again there's someone who's rattling paper and rattling their speak on the line. If you could stop rattling or put yourself on mute our next speaker would really like that.

MR. SHRUM: Thank you. It sounds like this. My name is Dan Shrum, I'm with Energy Solutions, and I too would like to thank - I'm very grateful for the opportunity to speak on this topic and it's nice to be able to do it in this forum. We very much appreciate that. I'm going to speak specifically on the time frame and I'm going to try to answer the question if not 20,000 years, what is the

number and why. And I'm going to address that backwards. I'm going to say why we didn't select 20,000 when we went through the same process. And that may help to understand why we don't think 20,000 is the correct number.

We've been participating in this for quite awhile now and after the SECY paper was written we knew that we had work to do. We knew that we were going to have to prepare a new performance assessment for our client facility. We didn't you know shirk from that, we knew we had to do something. So we looked at past guidance, we looked at past things that had been done by the NRC and we looked at the EIS for Part 61 and there was a number in there. We looked at the NUREG documents and there was a number in there. We attended the discussions on depleted uranium, the round table discussions, and I disagree with what the conclusion in the analysis here came up with. We thought we were kind of zoning in, coming in to a number of about 10,000 years. It seemed like the right number. Then as I was reading through the paper, was looking at your five decisions, you know, the five decision bullets that's on page 21 and John has talked about this before. There was these five decisions and that's where option 3 was decided.

Using those decision criteria option 3 was decided. But then those options, those tools weren't used in my opinion when the 20,000 was decided. It went away. As I read through the paper and got to the final number it reminded me when I was much, much younger watching The Empire Strikes Back and we found out that yes indeed, Darth Vader is Luke's father. That was a real shock. I wasn't expecting that. You know, in hindsight it seems kind of funny, everybody makes fun of it now. Everybody, you know, there's other shows, that shows up in other movies. But as I read this I'm like well where did that come from. I don't remember discussing 20,000 anywhere or seeing that number before. So then I went through the justification for the 20,000 and I understand the principle. I don't know that I agree with how we're going to be able to get there.

We have invested quite a bit of significant resources in modeling our facility to 10,000 years. As it clearly indicates in the paper that doesn't mean we can't change the number and crank it again, that's easy to do. But what does it mean? We thought it was a stretch with the 10,000, especially with, you know, we know our site very well, it's been very well characterized but it's a stretch

to go out 10,000 years. So now we're going to look at ice ages. And it's not just the 20,000-year number that's an issue, it's based off of ice ages and significant climate changes. Will we be able to incorporate the significant socioeconomic impacts of those ice ages as we do our analysis? Will that be fair? This is not, we've looked in the past, a reasonable scenario. This is a game-changer. Life will be different as we know it. Will we be able to take credit for that? That's not clear in the paper and I think that'll have to be fleshed out if we have to stick with the 20,000-year time frame.

So I'm a geologist by training. As I look at these charts I don't see a big difference between 10 and 20 as far as the dose is concerned. I do see a significant difference in understanding what's happening at 10,000 and 20,000 years. That's the issue. We have been going down this pathway and I trust Larry that Larry's telling us that this is a - we have a pathway, we're following this pathway. You're true to your word. We're going to go through this process. But we thought we were going to be able to have this discussion when our performance assessment was completed which is just a few weeks away, actually two weeks away, in that discussion of

the significant decisions on after 10,000 years because that's where the - that's where the discussion is really going to be had, not getting up to that point. It's what risks are we as a society going to be willing to accept. We just thought we were going to have that discussion at 10,000 years as opposed to 20. So I know I beat that into the ground enough but I just had to get the Darth Vader reference in there.

Lisa talked about the intruder assessment and we must assume that the intruder will have access to the waste. In the concepts section – Section 61.7(c)(7) - I'll just read the tail end of it. So the assessment can employ similar methodology to that used for performance assessment, but the intruder assessment must assume that an inadvertent intruder occupies a disposal site after closure and engages in activities that unknowingly expose the intruder to radiation from the waste. Another assumption that we have always made is gauging a probability of whether or not we will have a realistic intruder or an inadvertent intruder at our site. This changes that probability to 1. We now have to assume that somebody's there. We don't believe that that's realistic. We don't believe that that's realistic because as Dave mentioned earlier one of the primary

safety measures is siting a facility. That has to be taken in consideration. We want isolation. Isolation means that this probability is much, much lower as opposed to a probability of 1. So this - I believe this is what Lisa's talking about, this is what we're referring to. Right now it looks like we have to assume, we have to assume somebody's coming in contact with the waste. But it's at year 100 and one day. And that's kind of - that's different than the way we've approached it in the past. Anyway, again thanks for the opportunity to discuss this important topic and that's all I have.

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

MR. DORNSIFE: When NRC was developing this draft regulation, did you give any thought to well, if we were the regulator this is what we would require. For example, when you say you know future climates, does that mean double the rainfall? What does that mean? I mean, have you put yourself as the regulator of how you would implement these things?

DR. ESH: This is Dave Esh, NRC. We are developing a guidance document that will contain much of what we believe would answer that question. In the

specific area of climate change as I said in my presentation when you're going to dispose of long-lived waste, and high concentrations and large quantities of long-lived waste you're going to be facing additional technical challenges. There's no way around that. I don't see how we can say a cornerstone of our whole process is stability and then we shortchange it just because somebody has lots of long-lived waste. We need to make criteria that you can go through the process and try to determine whether you can meet those criteria or not and I agree completely and I tried to emphasize in my presentation I think the correct way to use the various assessments is to identify when you may need to set limitations for your specific site. DOE does this all the time for their facilities, that's the way they operate, it's this waste acceptance criteria idea. I think there's a lot of merit to that if you're doing good technical analysis to support those limits that you develop. So that's kind of my answer to your question. We are developing a guidance document that expressed what we think should be part of the analyses, whether it's climate change or other long-term considerations or intruder assessment.

We - I think this idea about the intruder

assessment language that I'll have to look at it closely to see if I agree with your - the interpretations we've heard here. But our expectation is not that you have to assume somebody's building a house and they're digging into the waste. The language that says you occupy the site means that it is - does not appear to be credible to argue over very long time periods that nobody accesses the site. That doesn't mean they build a house. They may hike on it or ride ATVs or whatever the local practices are. But as you go out in longer and longer time frames it becomes much harder to argue what the local practices are going to be. In that case you have to do something that's reasonably conservative. Not necessarily, you know, the most speculative hypothetical bounding case you can develop, but something that's reasonable. In today's practices people build houses, people put in wells, they take activity like that. I think it's reasonable at very long times to apply those sorts of scenarios through your system and see what the risks may be. You can bring all sorts of arguments into play as to the credibility of the scenarios, but we - it is almost intractable to define what the probability of those human behavior scenarios are at very long times. And

I think the regulatory construct that we develop is trying to work with that. But it might not be clear from - it might not be clear from the language that we have right now. So we'll take a look at it.

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

MS. EDWARDS: It's a question.

DR. LESLIE: Okay, go ahead.

MS. EDWARDS: In the EIS for Part 61 there's two scenarios clearly outlined that have residential and agricultural, both scenarios, intruders, that involve excavation of large amounts of soil and assumptions associated with the amount of vegetables that are eaten from the garden and from how the soil is spread around and where they grow the food, et cetera. Are you saying that those assumptions may be disregarded in developing a site-specific intruder scenario?

DR. ESH: I think what I'm saying is that our guidance in say decommissioning and in NUREG-1854 that we apply to waste determinations has been - it's been developed more recently than say the EIS for Part 61. In those guidance documents we talk about over, you know, short to intermediate time frames there's some validity to considering local land practices and

scenarios in developing your assessment. When you get to very long time frames that could potentially apply for large quantities of concentrated waste it becomes much more difficult to argue that you know what the scenarios may be. So for long-lived waste you may use some sort of scenario like that. For typical waste I think there's a lot of validity, you know, if you have cobalt-60 or other short-lived materials, there's a lot of validity to arguing for alternate land uses and what they may be and what the risks may be. But that's - it'll be in our guidance, we have a whole section on intruder analysis including defining the overall scenario. Chris Grossman, raise your hand there. He's a couple seats away from you. He's the author of that section and I think it provides a lot of detail, so.

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

MS. YADAV: Yes, they will be - they'll be issued approximately the same time. They'll be issued

under separate Federal Register notices and have separate comment periods, but it'll be around the same time. They have to get approved by the Commission before we can issue them.

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

MR. MAGETTE: This is Tom Magette with Energy Solutions. A couple of comments. What you just said in response to Lisa, David, and also your comment just before that, I agree with that, that's kind of really my point is that I'm not sure that what you're attempting to accomplish isn't that sufficiently accurately reflected in the words, in the draft proposed rulemaking language. That was my first comment. What I hear you say you're after is not what I interpret as what I read and so that's one comment. And of course the related thought is there were some comments this morning about guidance that may come out. You have to be real careful where you draw that line. I'm not looking to get a new rule but some clarifying words in guidance might not be adequately helpful.

And my second comment goes to this notion of the period of performance because I also agree with what you were saying. As you go further out in time it becomes very difficult to make projections about the site. Maybe Utah will look like Hawaii in 20,000 years. I'll be surprised but I - basically from everything I can read from everybody that's ever written on the topic, including the National Academy Study (NAS) for a geologic disposal, they said we can't say. Even for geologic disposal. We have no confidence in any sort of analytical prediction. None. Can't be done. But because of the uncertainty, because something could happen we should have some idea of what that means. It goes to the comment we're making. But that's why I say that should not be in a compliance context. It's not looking at what might happen, it's not making a very conservative assumption saying okay, let's just assume the worst. What happens if it's the worst. And because the - what happens if it is the worst? What if it's Lisa's 2rem number and the decision-maker says that's the worst? That's not so bad. In some sort of context in a - outside of a compliance time zone that could be a perfectly acceptable outcome. Not in the compliance time zone. That's what I mean by having the decision-

maker's hands tied. So I agree, as you push out in time you strip away that latitude. When you put it in the compliance box I think you create a problem that's not sound regulation, those regulations.

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

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

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

MR. MAGETTE: They go in two tiers.

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

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

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

DR. LESLIE: Thanks, Bill. John?

MR. GREEVES: On the same thread, I'll just comment on. Chris, you're writing that section, that's good. The comment is this isn't the first time people have discussed this dilemma of how to treat scenarios way out in time. The two examples that we do have that I urge you consider are Yucca Mountain and the WIPP program. And in Yucca Mountain's case they have a fairly specific scenario defined for that

site-specific location. They I think had wisdom in not having unbridled speculation about the way things could look. They specified a certain scenario process there. So I call that a stylized scenario. Different unit there.

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

DR. LESLIE: Thanks for your observation.

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

DR. LESLIE: Well, for - I want to - people are warm and I want to give a chance to people on the phone. And we'll come back for any follow-up questions and more comments here in Rockville. So is

there anyone on the phone right now that has comments on the period of performance? If you could identify yourself. Is the bridge line still alive?

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

I think one of the first questions I'd like to ask is from a regulatory perspective has the NRC ever prescribed a standard in a rule but then issued guidance that allows a lower standard? And this goes back to the discussion I think during Dr. Esh's presentation where in using the 20,000-year period of performance that for sites that don't have the high quantities or concentrations of uranium or depleted uranium that they could then have a shorter period of performance. So my question is has the NRC ever issued a regulatory standard and then turned around and issued guidance that allowed a lower standard.

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

MR. MCKENNEY: This is Chris McKenney, NRC. Actually in the decommissioning rule that's exactly what occurs. In the decommissioning rule the dose limit is a peak up to 20,000 - up to 10,000 years - sorry, revert back. Peak up to 1,000 years. But while specifically for like building surfaces the guidance is for a 70-year life for the building and to look at building surfaces. We don't look at an analysis over the entire thousand years for activities left on building surfaces. And in fact, that we focus the analysis, even though it's a 1,000-year analysis, we focus for quite a few radionuclides on just the first few years like ground contamination of cesium, cobalt-60, things that will decay relatively quickly over the first few decades rather than needing to perform the analysis or focus on the later time periods. So that is not really a new concept from what is already consistent in the regulations since 1997. And the rules - the regulations and guidance together and since 1997.

DR. LESLIE: Thank you, Chris. I hope that answered the person's.

MR. KLEBE: From my perspective it seems more appropriate to - a shorter period of performance - and I'll get into why here in a minute - and then

have some guidance that says if you have certain waste streams or certain waste characteristics that you then need to go out for a longer period of performance. There are a slug of existing low-level radioactive waste disposal facilities and most of them I'm not aware have accepted large quantities of higher concentrations of uranium or depleted uranium up until now. I mean, if you take a look at the closed sites of West Valley, you know, Beatty, Nevada, Maxey Flats, Kentucky, Sheffield, Illinois, to my knowledge they haven't received large quantities of uranium. And in the operating sites of Barnwell and Richland I'm not aware that they're receiving it either. So to me it seems like historically and based upon your waste characteristics chart that, you know, for most commercial low-level radioactive waste the period of concern really ends at about a thousand years and that your regulation ought to be written towards that with some statement that if you are accepting waste that have you know substantial in-growth of daughter products and will increase in radioactivity over long periods of time that then your period of performance needs to go out farther.

The whole idea of a secondary period that has no dose limit, you know, while I can find that may

have some value I'm immediately questioning what's the point. If you don't have a regulatory standard that it has to meet past that period of performance how are you decision-makers going to put that into perspective? How is the public going to respond to it? The public is going to say well okay, you're going to take this out to 20,000 years and then oh, by the way, for the next you know gazillion millennia there is no regulatory limit. I think that's hard to justify.

And then with respect of the period of compliance for 20,000 years to start to catch climate extremes as in glaciation which is what your discussion in the document Technical Analysis Supporting Definition of Period of Performance for Low-Level Waste Disposal, beginning on page 25 and continuing on for a couple of pages that's what it appears the 20,000 years is meant to capture. Then you know, for normal low-level radioactive waste the - the potential for glaciation at a low-level radioactive waste disposal facility pales by comparison with the glaciation of thousands of square miles of civilization. You know, if you were to have a mid-continent, northern mid-continent disposal facility subject to glaciation well there are, you

know, lots of areas of municipal development, i.e., Chicago, Milwaukee, all those other you know communities that would you know seem to me to have more of a long-lasting or a more greater health impact than waste that has already been decayed away. And it seems to me that if the intent is to physically preserve an intact waste disposal facility in the northern mid-continent region to survive glaciation then that seems to me that you're going to force disposal in that region to be a geologic type disposal, something that's not going to be subject to glaciation.

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

MR. KLEBE: I guess it would sort of depend upon if you had any response. Most of the people there know I can go on forever.

DR. LESLIE: Oh, okay.

MR. KLEBE: - but I can come close.

DR. LESLIE: Okay. Twenty thousand years' worth? No, just kidding. Kind of a point of housekeeping. Right now we're coming up to 2:30. We can run this two ways. What's happened here in Rockville is it's a sauna. People's ties, jackets,

brows are - and faces are quite red and wet, and they just turned down the heat. So I think the people here probably want to take a 10-minute break and we'll reconvene. Pardon? Okay. Okay. We have one comment from our Office of General Counsel here and then we're going to go on a 10-minute break. We'll come back, continue with the people on the bridge and then we'll make sure that everyone's comments have been provided for the people on the bridge. And if they're clarifying questions that the staff need to respond to then we'll do that. But again, kind of a reminder, the staff today are primarily in the listening phase and what they're trying to do is only provide answers to clarifying questions, where there's something unclear in what was presented. So again, rather than - it's not a round table, it's not a discussion, they're in a listening mode. So Lisa?

MS. LONDON: Yes, I just wanted to answer one quick question that came up. I forget the gentleman's name had asked something to the effect of can something set out in guidance actually supersede that which is in a regulation and the answer to that is quite simply no. No, it cannot. And I would like to reinforce what Brett just said which is that we are in a listening mode, we can provide you facts that are

already publicly available and that's the extent of what we're doing today. We are in a listening mode. Thank you.

DR. ESH: I think that was Mike from Illinois, is the last speaker that said that, Lisa. And what I was going to reply was I wasn't implying or meant to imply in my presentation or in the discussion on that topic that you could do a shorter compliance period. The compliance period is what it is in the regulation when the regulation is finalized. For a site that has say short-lived waste or low concentrations of long-lived waste you can do a more simplified analyses that turns the crank out to 20,000 years to justify that your risks have been appropriately managed. But it doesn't change the number that's in the regulation. So it allows you - it's basically a level of detail question and in risk-informed performance-based regulation that's exactly how it works. You should have high level of detail and comprehensive information when the risks are high. You can have simplified information and lower level of detail when the risks are low. So that was the concept. Mike, I hope that answered your question.

DR. LESLIE: Okay, Dave, thanks for that clarification. We're going to go ahead and take a 10-

minute break.

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

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

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

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

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

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

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

DR. LESLIE: Go ahead, Susan.

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

And there is a statement in that first paragraph that says, "Applicability of the requirements in this part for waste disposal facilities in effect on the effective date of this rule will be determined on a case-by-case basis, and implemented through terms and conditions of the license or by orders issued by" -- I guess it would be the Commission or, you know, the Agreement State.

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

DR. LESLIE: This is Brett Leslie. We're going to get someone to try to address that from the

NRC staff. Please identify yourself, too.

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

DR. LESLIE: Susan, I don't know if that --

MS. JENKINS: Okay. Well, I guess the question is, would that first paragraph be revised --

MR. CAMPBELL: I don't believe the staff is --

MS. JENKINS: -- to remove that sentence?

MR. CAMPBELL: -- planning to propose revisions to that paragraph at this time.

MS. JENKINS: Okay. Thank you.

DR. LESLIE: Thank you, Tison.

Anyone else on the line have --

MR. SEITZ: Roger Seitz.

DR. LESLIE: Go ahead, Roger.

MR. SEITZ: Oh, I was just checking in. I

just dialed in.

DR. LESLIE: Oh, okay.

(Laughter.)

That's good. You're on the record now.

Anyone else have a comment on the bridge line?

(No response.)

Okay. I'll check one more time before we wrap up the meeting. I'll give people a second or third chance here. Anyone else in the building here in Rockville have a comment that hasn't been addressed yet or -- John? You'll need to hold it close to your mouth.

MR. GREEVES: I don't know whether you've been taking parking lot items or not. It's blank right now. But I would say there is a parking lot item of -- what is the compatibility criteria? I'd like to ask that you share that with us before our comments are given, so that it would help reflect the feedback to you.

And then, second, it is really a caution. You talked about the guidance being done in the same timeframe as the rule. And this whole question, which we spent a lot of time on this afternoon, about 20,000 years, I don't know how you are going to develop the

guidance without knowing the answer of what the performance period is.

So I don't know of a way to do that, but if you think of it let us know what it is. Once you write that into guidance, it becomes fixed, so -- anyhow, just a caution about how to handle the 20,000 ECM guidance phase, when it really doesn't get set right.

DR. LESLIE: Thanks, John. Andy?

MR. CARRERA: Hi. This is Andy Carrera, NRC. This topic of compatibility categorization has come up a couple of times, and I just want to reiterate that it is in a preliminary state. The working group has predetermined -- preliminarily determined the compatibility categorization.

However, it has not been vetted through the Agreement State. There is a process for that. It has not been vetted through the standing committee on compatibility, which members of the -- at NRC, we would look through what we have proposed and provide feedback on whether we are close or not.

So it has not gone through that. Therefore, we cannot provide it to anyone else yet at this time.

DR. LESLIE: Thank you. Priya?

MS. YADAV: Just to add one more thing to that, to what Andy mentioned. We have an Agreement State representative on our working group, and we meet every week and we have talked about the compatibility categories for several weeks now. And so we had been getting the Agreement State perspective, and that actually fed into this -- what the Part B that I guess John and Tom brought up.

Part of the reason why we have preliminarily noted that as Category C is based on some comments we got from our Agreement State representative. So hearing your comments today, we will obviously go through the process and look at the compatibility categories again. But that is just kind of some feedback that we have Agreement State input into our compatibility categories.

DR. LESLIE: Okay. Any other final comments? Oh, we've got another hand. Right behind you, George.

MS. EDWARDS: Okay. I think as a horse it isn't quite dead yet. I want to go back to those projections at 10,000 or 20,000 years. This is what I would say. When you ask someone to do a dose projection that far out, you are asking them to produce a number with such great uncertainty that it

is a meaningless number.

If I told you a thousand years from now we are going to get an inch of rain on a day a thousand years from now, plus or minus -- well, plus five inches, minus one inch, but I said, okay, I did my little calculation, I made these assumptions, it's one inch plus or minus one inch. It's a meaningless number. It means I really don't know what the dose will be.

You know a little more than that, because you have the source term which you can calculate. What you don't have is any reasonable assumptions you can supply for a dose pathway. You are asking people to produce a number that has huge uncertainties and is, therefore, meaningless. But once that number is produced, it will be treated as a real number and a valid number.

And I think that there is danger in that and it implies a level of knowledge that we do not have.

DR. LESLIE: Thank you, Lisa.

All right. I don't see any hands raised or people standing up or otherwise identifying that they have comments.

I will drum up one last time for the

people on the bridge line. Any last comments from those on the bridge?

(No response.)

All right. I think Larry has a few closing comments, and after he's done I'll close out the meeting.

MR. CAMPER: Thank you, Brett. What I plan to do is when we get through these things -- many of you have been to this -- I try to capture, you know, moments that cause me to stop and think. And what I'll try to do is identify some things I heard along the way.

But let me reiterate before I do that what I said this morning. This is indeed an opportunity for staff to listen, and that's what we're here to do. I indicated that this discussion today might result in significant changes, and it may. We have a lot to think about. We've got to go back and review the transcripts, talk about that, and so forth.

So I guess my first point would be is that we have listened. We have heard everything you have had to say. We will do a thorough analysis, and so forth.

I think that much of the commentary that I have heard today really comes back to the challenge,

as I said this morning, associated with this unique isotope and form called depleted uranium. It is indeed a challenge. In fact, I think I could make a fair argument that it is among, if not the most challenging things that we have to deal with in waste management at this point in time.

I would echo what John Greeves said, a lot of good comments, a lot of good dialogue. This is what we wanted. We wanted a lot of input. We wanted to hopefully along the way just provide clarifications as things come up. We hope that we've done that, and throughout we've shown you that we are listening.

Let me kind of go through just a few, you know, things that I have heard repeatedly or kind of give one pause. And I'll start from the back and go to the front, because some of them repeat themselves many times, and that way we don't have to go through that but once.

Clearly, this question of using realistic scenarios and trying to define assumptions that take you out to a period of 20,000 years, repeatedly this was brought up as a huge challenge and a great degree of concern.

There was a comment made by one of the individuals on the line toward the end. First, there

was this question that was asked about, you know, what can you do in guidance, or undo in guidance what you have already done in a rule, and can you do that? And, of course, Lisa made a great clarification from the Office of General Counsel. And we have cited some examples where we have tried in guidance to clarify certain things.

But what I found most interesting about that particular point in the discussion was basically the listener suggested that maybe we ought to be using a reverse approach. We built this thing all around depleted uranium, and we've defined the 25,000-year -- or, excuse me, the 20,000-year period -- let's not make it longer.

(Laughter.)

The 20,000-year period of compliance would in fact, one could argue, given that 90 percent, if not 95 percent, of all the radionuclides to be disposed of are decaying much sooner than that, and a thousand years gets you there, certainly a couple thousand years gets you there.

Maybe what we really ought to be doing is building it all around the majority of the radionuclides to be disposed, and we are going to consider all radionuclides and not just depleted

uranium, but handle depleted uranium as truly the outlier that has a specific consideration. And so doing it in reverse, if you will, for lack of a better way to put it.

There was a point made that along the way we thought we had an agreement on 10,000 years during the public meetings. I certainly, from my perspective, can understand that, because in both public meetings I cited the language from NUREG-1573 that talked about 10,000 years, and in citing longer-lived radionuclides in environmental assessment space. So certainly I can understand why one would have gotten that impression, but, of course, we have continued to work the issue.

There is a fair amount of interest in what DOE is doing and the notion that there should be perhaps more harmonization between what it is that DOE is doing and what it is that we are trying to do in this particular rulemaking initiative.

Some concern was brought up, again, about the fact that SECY-08-0147, the SRM, and that blending has been brought to bear on this, and how does that all now fit into this package, given that blending -- the blended material really has very little, if anything, to do with the problems associated with

disposal of depleted uranium.

Certainly, the idea, again, that DOE and NRC should confer regarding a period of performance was put forth.

A lot of discussion about this probability of intrusion being at one, that it occurs at 101 years, and that even under those arguably conservative and deterministic approaches we are using a worst-case scenario on top of that. And so a lot of concern was expressed about that along the way.

DOE offered a lot of comments, many of which had to do more broadly with Part 61 at large and the look that we are taking at Part 61 at large, well beyond what we are discussing here today of course.

Unintended consequences, that came up multiple times -- unintended consequences. And at several times different concerns were particularly enunciated about unintended consequences, but certainly there was a great deal of concern about that.

This morning we had a discussion -- Dave was talking -- Dave Esh was talking about reprocessing in his presentation and reprocessing came up later in the discussion. I do want to draw one clarification on that point. The Commission has not decided yet

whether it is going to do a rulemaking on reprocessing.

The Commission has -- the staff has undertaken a gap analysis. We are working on environmental analyses. But if the Commission does decide to do a rulemaking on reprocessing, clearly its timeline appears to have moved out into the future as well. Just a minor clarification on that point.

And, again, this notion that, you know, you are applying this to all waste. And it seemed kind of interesting -- there has been a school of thought that says, you know, you should capture all radionuclides within this rulemaking. But having done that, while that is a good thing, the notion of 20,000 years, and so forth, may have had an unintended consequence, which I cited earlier.

Compatibility -- what is the level of compatibility to be assigned? I know of no rulemaking where the issue of compatibility doesn't become an issue. Through the Agreement States, I would like to see a lesser assignment of compatibility because they prefer to have as much flexibility as possible.

In this case, we do have a representative on the working group from the State of Texas. The State of Texas has already taken certain actions in

its regulatory process around the timeline for evaluation, so it is certainly understandable that Texas would want flexibility.

It was pointed out that we do have a rather rigorous process that we go through, as compatibility is assigned. Yes, we have, from the working group, some thoughts at this point about assignment.

We did discuss Level C for this particular issue, but it's not a done deal yet, although, John, your point is well made in terms of the public wanting to understand what would be the level of compatibility to be assigned. That will be determined by the time we come up with a proposed rule per our process.

There was a fair amount of commentary about the dose at 500 millirem, and, again, linking it back to this probability of one. And certain other regulatory activities were cited that are taking place with FEMA or EPA that, you know, result in different numbers. And, therefore, the question of whether 500 millirem is the right number was challenged somewhat.

Repeatedly we heard that 20,000 years, of course, is a new number. Therefore, it is not consistent with what has transpired previously, and, therefore, that raises some concerns about

credibility, and why have you opted for this new number, even though Dr. Esh, in his presentation, tried to explain why we settled on that number. I think there is still a fair amount of concern about the fact that it is a new number, and it is not consistent with what has been used elsewhere and in the past.

Very early in our discussion, the notion of disposal at greater than 30 meters was raised as an issue, and we quickly pointed out that, yes, we agree that is a problem, to use that as an example.

So just notes that I jotted down along the away, and there are others as well. But those are ones that came across repeatedly or loudly, with care and emphasis. So we have a lot of work to do, and I think that, speaking on behalf of the staff, we appreciate all of the input. We will go back and digest thoroughly what we've heard.

I want to close by thanking the staff again for their hard work, Casey for helping us out, and Antoinette who is outside helping us out. Our facilitators, of course, you did a great job, gentlemen. We thank you. And especially all of you for taking the time and having the interest and providing some extremely interesting comments.

We thank you.

DR. LESLIE: Thank you, Larry, for your closing comments.

A few last bits of housekeeping. I definitely want to echo Larry's comments on people being able to primarily follow the ground rules and really respect the participants. I think your flexibility in not using the hand mic in the afternoon was only paid back by having the room too hot.

(Laughter.)

Which gets me to those participants here in Rockville. If you do have complaints about what George and I did today, or what Larry did to you today, you can always fill out the meeting --

(Laughter.)

-- public feedback form. So I guess with that, again, thanks everyone for your participation. It has been great to see you all.

And for the people on the bridge, thank you for your participation as well. It has been quite enlightening.

Thank you. And this meeting is adjourned.

(Whereupon, at 3:06 p.m., the proceedings in the foregoing matter were adjourned.)

CERTIFICATE

This is to certify that the attached proceedings before the United States Nuclear Regulatory Commission in the matter of: Proposed rule revisions

Name of Proceeding: 10 CFR Part 61
Public Hearing

Docket Number: (n/a)

Location: Rockville, Maryland

were held as herein appears, and that this is the original transcript thereof for the file of the United States Nuclear Regulatory Commission taken by me and, thereafter reduced to typewriting by me or under the direction of the court reporting company, and that the transcript is a true and accurate record of the foregoing proceedings.

Kayla Gamin
Official Reporter
Neal R. Gross & Co., Inc.