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<td>Christopher Grossman, Assistance Performance Analyst /RA/</td>
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**Summary**: The following document should be added to ADAMS with a date of September 15, 2009

**Title**: Nuclear Regulatory Commission Official Transcript of Proceedings for September 3, 2009

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

PUBLIC WORKSHOP 1 ON UNIQUE WASTE STREAMS -
DEPLETED URANIUM

THURSDAY,
SEPTEMBER 3, 2009

BETHESDA, MARYLAND

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

PANELISTS PRESENT:

CHIP CAMERON, Facilitator

CHRISTINE GELLES, U.S. Department of Energy

GREG KOMP, U.S. Army Safety Office

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

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

ARJUN MAKHIJANI, Institute for Energy and
Environmental Research
PANELISTS PRESENT (Continued):

DIANE D'ARRIGO, Nuclear Information and Resource Service

THOMAS E. MAGETTE, Energy Solutions

WILLIAM DORNISFE, Waste Control Specialists

FELIX M. KILLAR, Nuclear Energy Institute

MICHAEL T. RYAN, NRC Advisory Committee on Reactor Safeguards

STEPHEN WEBB, Sandia National Laboratories

PETER C. BURNS, University of Notre Dame

GREGORY SUBER, U.S. Nuclear Regulatory Commission

DAVID ESH, U.S. Nuclear Regulatory Commission

JAMES KENNEDY, U.S. Nuclear Regulatory Commission

ALSO PRESENT:

KAREN PINKSTON, Nuclear Regulatory Commission

LARRY CAMPER, U.S. Nuclear Regulatory Commission

DAVID ESH, U.S. Nuclear Regulatory Commission

MARK FUHRMANN, U.S. Nuclear Regulatory Commission

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

JOHN GREEVES, Talisman International

DUNCAN WHITE, U.S. Nuclear Regulatory Commission

DAVID JAMES, David James Consulting
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>AGENDA ITEM</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilitator Opening Comments</td>
<td>4</td>
</tr>
<tr>
<td>C. Cameron, NRC</td>
<td></td>
</tr>
<tr>
<td>Issue 1.5: Modeling of Uranium Geochemistry in a Site-specific Analysis</td>
<td>44</td>
</tr>
<tr>
<td>Introduction</td>
<td>44</td>
</tr>
<tr>
<td>K. Pinkston, NRC/FSME</td>
<td></td>
</tr>
<tr>
<td>Issue 2: Unique Waste Streams</td>
<td>106</td>
</tr>
<tr>
<td>Introduction</td>
<td>106</td>
</tr>
<tr>
<td>D. Esh, NRC/FSME</td>
<td></td>
</tr>
<tr>
<td>Issue 3: Agreement State Compatibility</td>
<td>152</td>
</tr>
<tr>
<td>Introduction</td>
<td>152</td>
</tr>
<tr>
<td>D. White, NRC/FSME</td>
<td></td>
</tr>
<tr>
<td>Issue 4: Long-Term Rulemaking: Waste Classification</td>
<td>211</td>
</tr>
<tr>
<td>Introduction</td>
<td>211</td>
</tr>
<tr>
<td>L. Camper, NRC/FSME</td>
<td></td>
</tr>
<tr>
<td>Issue 5: Other Considerations</td>
<td>228</td>
</tr>
<tr>
<td>Introduction</td>
<td>228</td>
</tr>
<tr>
<td>P. Bubar, NRC/FSME</td>
<td></td>
</tr>
<tr>
<td>Adjourn</td>
<td></td>
</tr>
</tbody>
</table>
(8:39 a.m.)

FACILITATOR OPENING COMMENTS

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

Fifty seconds, Larry.

(Pause.)

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

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

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

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

(Laughter.)

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

(Laughter.)

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

There was a suggestion that there should be some sort of response from the NRC to the issues today. And I think that Larry and his staff are probably going to prepare a summary for the Commission on notable issues from this workshop. And I am not sure they have decided that that is going to be public or not. And this is probably news to Priya. You are
telling her she is going to be doing that. At any
rate, there will be some type of a response.

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

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

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

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

There was an issue raised by Larry's
presentation. And I think, Patty, this might be in the other considerations. This is the sites that are expecting DU versus sites not expecting DU. At least that was the way it was framed by Janet Schlueter from NEI yesterday, the whole idea of how do you consider waste that has already been disposed of when you are considering the proposed disposal of waste and other issues like that. We will be talking about that.

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

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

Several rulemaking process issues were raised yesterday. There was a suggestion from the NRC staff. Maybe we can limit the rule to certain categories of DU, certain sources of DU; for example, enrichment. And, as Christine pointed out -- and I
think there was a lot of agreement that this would leave some important DOE DU waste out of the picture.

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

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

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

In terms of guidance on the rule, there was a call for clear guidance to licensees to let them know what they had to do in the performance assessment, but there were also comments about the need for flexibility and for iteration in the performance assessment.
A lot of discussion, a period of performance for addressing DU. People well, well, look to precedence, look to the 10,000-year model. Arjun commended us to look at the French experience on this. There wasn't any agreement on what it should be, but I think people felt that that period of performance should be something that is specified in the rule, rather than left to guidance.

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

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

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

In terms of source term. we had a lot of
talk about engineering and barriers. There was a suggestion that there might be a minimum standard for waste form performance that takes into account the geology of the site, but several people reminded us that don't make the rule about waste form. And several people commended us to look at the DOE work on waste form.

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

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

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

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

MR. DORNSIFE: Yes. I guess I would like to just revisit quickly the issue of some lower limit that is okay to continue disposing while deliberations are being made. Is everybody comfortable that cone
the final rule is published and it says, "Thou shalt
do a performance assessment to determine what, if any,
you could take," that any disposal that is occurring
of any DU will come to a screeching halt until, first
of all, the agreement state implements that regulation
and, secondly, the performance assessment is done. I
mean, that was my concern with having some sort of a
level specified somewhere that shouldn't cause any
impact to any currently licensed disposal facility.

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

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

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

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

His assumption is if there isn't something
like that in the rules that states will say, "We are
going to establish a moratorium on disposal until the 
agreement states implement the rule," I would ask you 
to not only comment on the idea of the okey-dokey low 
level that Bill was talking about. But also is that a 
good assumption that he is making that if there isn't 
something like that, that there will be moratoriums? 
Felix? And then I'll stop talking.

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

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

So it wasn't a de minimis or something 
along that line. It was, if you meet this criteria, 
you are okay. If you don't meet this criteria, you 
are going to have to do something more significant.
And I think that is kind of what Bill was trying to apply, that what we are looking for is a very gross line of approval that if you are within this level, fine, business as usual, what have you. However, if you exceed this level, then you have to do more work and more justification for why you continue doing what you are doing or what have you stuff.

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

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

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

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

But this standard that you are talking
about, that would be something that would be set in
the rule. So it may not be effective because the rule
wouldn't be implemented then. So there would have to
be some other mechanism, I guess, to do that. And I
don't know what that mechanism is.

Christine, what do you think on this?

MS. GELLES: Thanks, Chip.

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

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

And I am just going to look to Larry and
to Patty. I think it is the Commission's intent. I
mean, I think it is pretty clearly stated that today
DU remains a class A waste and should be managed as a
class A waste up until the time that there is some
rulemaking that changes that or requires additional analysis.

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

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

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

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

MR. DORNSIFE: Well, no. This discussion
occurred before that.

MS. GELLES: Okay.

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

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

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

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

And I know that Larry and his staff have had conversations with the state regulators about this. And there may be something that is going to be done in state space in the interim that may alleviate this problem.
I am going to ask Richard, in addition to what else he is going to say, if he could talk to that, too. But, Tom, go ahead.

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

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

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

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

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

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

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

FACILITATOR CAMERON: Okay. We are joined on the issue now on what happens in the interim. And, Tom, that was a great, great summary. And it may be that since we have had so much discussion already on this point, that we keep discussing this interim issue
and finish it off right now, instead of waiting until this afternoon. But let's go with the flow and see what happens.

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

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

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

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

And I would state from our standpoint to realize that each state has the ability to be more
restrictive than the federal guidance on that. So in Texas' case if that is their prerogative to have a more stringent standard or Utah, so would South Carolina probably for that matter.

FACILITATOR CAMERON: Okay. Thanks. Thanks, Richard.

Arjun? And then we'll go to Larry.

Arjun?

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

So I think I would urge a very specific exclusion because the record on this point is very, very clear. If you are going to allow this, then the question arises, are you going to unbury this waste if some different decision is made? We already had been discussing yesterday that a one million-year time period for shallow land burial doesn't make technical sense just in terms of performance assessment. At
least some people believe that. So I think that should be off the table as an interim matter. Otherwise this rulemaking doesn't make any sense.

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

It is in the draft EIS. The evaluations were done. I recognize, you know, the reference sites may not correspond to all the exact sites which would be disposed of, but at least there is a record there. There is a regulation there. There is an evaluation there. And there would be at least a reasonable case for allowing that in the interim.

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

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

FACILITATOR CAMERON: Okay. All right.
MR. MAKHIJANI: I said small quantities that were considered in the earlier rulemaking. As defined in the earlier rulemaking, I think that would be a reasonable case for allowing that, which is less than 50 nanocuries per cc and 17 curies per site.

FACILITATOR CAMERON: Okay. Go back to that.

MR. MAKHIJANI: Yes.

FACILITATOR CAMERON: Okay.

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

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

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

MR. DORNSIFE: Just a quick question. I would assume that you would have no problem if an agreement state has already approved something in a license that has gone through a performance assessment
and is justifiable that you could use that concentration, ultimate limit, or whatever.

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

At the time, as the record stood then -- maybe you were hired after that. I don't know, Bill. But, as the record stood then, I felt the WCS was completely unqualified to receive waste, much less dispose of it, because in the license application, they proposed to dispose of 12,000 metric tons of 235U in the waste, which corresponds to more 235U than has ever been mined.

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

So I don't have a lot of confidence in what the states are doing. I don't know if your technical capabilities at your company improved since that license application version, but I am not comfortable with what I have seen of what the states
are doing. And I am on the record as saying that the NRC is not fulfilling its oversight responsibilities.

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

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

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

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

FACILITATOR CAMERON: Okay. Thank you. And, Larry, the floor is yours.

MR. CAMPER: Thank you.

I mean, any one of these things could be
talked about for a very long period of time, but let me try to address at least what I have heard, provide some clarification in terms of what the staff is thinking, and perhaps provide some clarification in terms of the recommendation we made to the Commission about this topic and what happens in the interim. Then Patty will talk a lot more about it later in the day.

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

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

This question of what happens now, if you look today in 61.12, where it talks about certain technical criteria that is to be evaluated, and you look in 61.13, which requires a technical analysis,
there are those -- and we had the discussion amongst ourselves as we were developing this particular recommendation to the Commission -- as to whether or not there was any need to do anything more because a technical analysis, different term, not performance assessment, is already required and, thus, is also the case in parallel state regulations. The states that currently operate low-level waste facilities have such a requirement in the regulations.

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

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

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

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

So this initiative that the Commission is pursuing now is above and beyond that for that reason. That's why I said yesterday it is an enhanced regulatory presence over the disposal of depleted uranium.

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

The Commission gave considerable weight to the authority and ability of agreement states during the LES national enrichment facility hearings in order CLI-06-15, which came out in June of '06. The Commission states, "The NRC does not regulate any of
the five near-surface waste disposal facilities identified in the FEIS as potential locations for disposal of the LES depleted uranium. These potential disposal sites are either regulated by state authorities under the NRC's agreement state program or by DOE. If LES ultimately chooses one of these waste disposal facilities will fall within the purview of one of these authorities, not the NRC, to approve and regulate the disposal, we would expect," my emphasis, "we would expect the appropriate regulatory authority to conduct any site-specific evaluations necessary to confirm the radiological dose limits and standards can be met at the disposal facility in light of the quantities of depleted uranium envisioned."

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

So I think if one looks at the regulatory basis today in part 61, if one looks at the Commission's expectations, as expressed during the LES proceedings with regard to the role of the agreement
states conducting a site-specific performance assessment, I think the basis is clear it is there.

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

I said yesterday in our remarks that we think it would be prudent to revisit that performance assessment. We use that term carefully because, on one hand, as I said, one can argue that you already had this requirement in part 61, the technical analysis, but, yet, at the same time, we are taking an enhanced regulatory step, presuming this rulemaking becomes a reality. So we are trying to find a balance in our terminology by suggesting that it would be prudent that performance assessments be reevaluated, they be modernized, and they be appropriate for the material that is expected to be received at these sites.
The staff and the Commission, for that matter, are fully aware that there is a high probability that depleted uranium will go to at least certainly the Clive, Utah site. And, therefore, we are placing an emphasis upon this particular point in terms of the role of the performance assessment.

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

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

So I think that the interim is underway.

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

MR. MAKHIJANI: I am completely confused.

FACILITATOR CAMERON: We will hopefully un-confuse this. And one way of doing that is we heard what Larry has said and particularly the last
part about the states already doing performance assessments to look at DU, possibly an offer of any assistance from the NRC in doing that.

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

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

Okay?

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

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

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

MR. CAMPER: I don't know how to say it more clear.
MR. MAKHIJANI: Including from the plant or not?

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

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

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

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

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

MR. CAMPER: The agreement states --
MR. MAKHIJANI: It's a straightforward question.

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

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

FACILITATOR CAMERON: I think that Arjun --

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

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

If you are going to allow depleted uranium
disposal from enrichment plants in the interim, you might as well forget this rulemaking and forget CLI-19-05 from October 2004.

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

MR. MAKHIJANI: He should say so. He should say yes, we are going to allow depleted uranium disposal from enrichment plants if that is the intent. If that is not the intent, he should say current practice is allowed but enrichment plants, not allowed. We are looking for some clarity here.

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

MR. CAMPER: I have asked the Office of General Counsel to review the document that Arjun is referring to. But in the course of the proceeding, the Commission reiterated for the purpose of the proceeding that it was class A waste. The Commission then asked the staff to do a certain type of analysis and question if these are the quantities.
Nothing in the proposed action by the Commission at this point in time changes the class of waste. It remains class A waste.

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

MR. CAMPER: Regarding your question on what happens in these states, I mean, for example, the State of Utah Radiation Control Board is currently considering a moratorium on the disposal of depleted uranium, large quantities from enrichment facilities. That is up to the State of Utah and its Radiation Control Board.

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

Now, we do not know what their action will be. If they were to pursue such a moratorium, it does raise a number of procedural questions to see how that would be enacted. And it does raise some questions
with regards to compatibility and so forth. But we do not know what that board will decide to do.

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

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

MR. CAMPER: Yes, that's correct.

FACILITATOR CAMERON: David?

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

FACILITATOR CAMERON: Good point, David.

MR. ESH: So there are arguments about
depleted uranium. I understand those arguments. But we still have to do this other piece, regardless of what is decided about depleted uranium.

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

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

FACILITATOR CAMERON: Okay.

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

FACILITATOR CAMERON: What you are saying is, are there some states that perhaps aren't meeting
the existing requirements of part 61 or --

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

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

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

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

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

   Let's go to Diane and Felix. Diane?

   MS. D'ARRIGO: I wanted to ask if states really had the authority to exclude unique waste streams. You know, I know that there are emergency access provisions that can require facilities to take waste either from out of compact or -- yes, I guess it
would be out of compact. But do states have the
authority to limit what goes into the facilities?

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

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

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

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

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

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done that.

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

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

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

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

When this rulemaking started, the concern was large quantities. And we had a big discussion
yesterday of the significance. But it is not
significant. It is really large quantities because we
are disposing of small quantities routinely. And we
need to continue that process.

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

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

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

And, as reality, large quantities, that is
not going to happen for a good number of years. DOE
is just in the process of starting up their
de-conversion facilities. The commercial sector is
just in the process of building their facilities. And so we are starting to accumulate some of these quantities. We have not really begun to dispose of large quantities.

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

FACILITATOR CAMERON: Okay. Thank you, Felix.

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

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

Having said that, that is an appealable decision. I mean, of course, if the company and/or the public can appeal that decision, it would play out in the legal battle at that point. But that is our position.
MS. D'ARRIGO: So is that authority based on state authority or the fact that you are in a compact?

MR. HAYNES: I think it is both.

MS. D'ARRIGO: Okay.

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

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

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

FACILITATOR CAMERON: Go ahead, Mark.

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

So as far as the immediate need, I understand where you are coming from there. There are projects where waste is accumulating. But it's not like this waste and these issues haven't been there for decades. So it might be a situation for you that...
you might have to go back to some things that have already been addressed within the regulatory framework where you are working as far as just interim storage while you are waiting for resolution of the problem.

I know that is not what you want to hear. You want to get it from point A to point B. But there might be a place in between that you are going to have to live with until things are resolved.

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

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

**ISSUE 1.5: MODELING OF URANIUM GEOCHEMISTRY IN A SITE-SPECIFIC ANALYSIS**

**INTRODUCTION**

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

In the screening analysis performed by the
NRC for the disposal of depleted uranium, the geochemistry was treated as epistemic or lack-of-knowledge uncertainty to account for different geochemistry conditions at a range of sites. This uncertainty could be better constrained in a site-specific analysis at a particular site, though.

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

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

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

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

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

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

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

And in this graph, the right and left edges of these bars, the two edges, correspond to the
maximum and minimum KD value reported in the literature. And the bar in the middle there corresponds to the geometric mean of the literature values.

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

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

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

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

The modeling of spatial and temporal differences in geochemistry, the differences between
near-field and far-field chemistry, the concentration of uranium and depleted uranium and in the vicinity of any depleted uranium that is disposed of in significant amounts will be much higher immediately in the vicinity of the waste and DU than further away in the environment. And this could affect the behavior of the system. Finally, site-specific differences in soil properties are important to be considered.

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

FACILITATOR CAMERON: Okay. Thank you very much, Karen. And if you could join us at the table again? Does our trio of experts, anybody have anything on that? Peter?

MR. BURNS: On the site variability slide you showed, there is an interesting factor there or an interesting observation that I would have made had it not been on the slide. And that is that after 100
years, assuming a flow rate of one meter per year, the uranium can move 100 meters. That is one of the scenarios that is shown there.

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

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

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

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

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

FACILITATOR CAMERON: Thank you, Peter.

David?

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

Then Karen's slide was mainly to illustrate transport in an aquifer, a saturated
aquifer, a distance of 100 meters. Generally for most of our problems, when you do that, analyses of resident receptor, they are at the edge of the disposal facility boundary. So you have some transport distance from the release until it gets to the receptor location.

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

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

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

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

FACILITATOR CAMERON: Okay. Thank you.

Yes? Go ahead, Peter.

MR. BURNS: Well, I would add to that that
the situation in the vadose zone becomes much more complicated in terms of modeling if one assumes a significant climate variability over, say, 10,000 years, where you could no longer anticipate an unsaturated or very slow flow.

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

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

FACILITATOR CAMERON: Thank you, Peter.

Bill, Bill Dornsife?

MR. DORNSIFE: Yes. Just an observation on this geochemistry issue. Depending upon the site location and the importance of the pathway, meaning water pathway versus radon pathway, a more soluble waste form, for example, in an arid environment, where
erosion is the problem, could be advantageous because you have less uranium there to create the radon source term.

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

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

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

So you would expect in a very specific performance assessment that it be modeled, that all of the phenomena that would affect the release and transport would be considered. And so you would be considering sort of a realistic depiction of what is happening with the source. So if you were leaching some of the things away, then you wouldn't have to consider them for radon.
FACILITATOR CAMERON: And, Peter, on that issue? Thank you, Karen.

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

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

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

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

MR. DORNSIFE: I understand what you are
saying, but, you know, when we are playing this model game, that just isn't true. When you consider erosion, if you have naked DU, you are going to have a potential huge exposure to future generations at that site.

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

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

MR. DORNSIFE: I am never subtle.

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

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

FACILITATOR CAMERON: Karen has something
to say on that.

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

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

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

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

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

MR. ESH: Just so we're clear, we want the impacts from both radon and groundwater to be
acceptable, period. We're talking about extremes here, different cases, and debating them. But the bottom line is it has to be safe for all pathways.

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

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

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

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

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

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

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

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

    So if you can engineer your waste to be compatible with your disposal system, that is certainly the way you want to go for if you are trying to deal with longer-term issues.
But yes, we have some guidance with respect to engineered barriers that we have done more recently than our low-level waste regulations for our incidental waste reviews. In NUREG-1854, there is a section there on engineered barriers and also in our decommissioning guidance in NUREG-1757. We have some guidance on engineered barriers there.

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

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

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

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

FACilitator Cameron: Okay. Thanks, Dave. Michael? And then we'll go to Peter. Mike?

Mr. Ryan: Thanks. David, you really summarized what I am going to ask about, which is that the other guidance -- you know, you work very hard on some waste determinations, which are unique and have long-lived components in them.

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

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

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

MR. RYAN: Absolutely.

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

MR. RYAN: Yes.

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

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

So thanks.

FACILITATOR CAMERON: Thank you, Mike.
Peter?

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

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

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

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

That perhaps can be addressed with
engineered barriers and so on, but the logical approach if one were starting fresh, from scratch, is to just think a little bit about the waste forms and think a little bit about the geology and look at natural analogues and put it somewhere that it is not going to move in any considerable way.

FACILITATOR CAMERON: Okay, Karen.

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

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

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

It might be the one that is leaching the most, but
that is my guess.

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

FACILITATOR CAMERON: Okay. Thank you, Karen.

Arjun?

MR. MAKHIJANI: Yes. I just want to correct the record regarding this validation question. I took my validation comment directly from the SECY paper. So you say you need validation. And that is why I brought up the thing. And today you are saying you don't need that validation in the traditional sense.

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

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

MR. MAKHIJANI: That's right. And if you need validation of the model, then you validate the model. I understand that the word "validation" can
mean different things in different contexts. You are talking about 10,000 years in the future. Validation procedure will be different than if you are talking about something that you can go to a lab and verify and validate in that sense. I certainly understand that. I am a scientist, too, like you.

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

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

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

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

FACILITATOR CAMERON: Okay.

MR. MAKHIJANI: I do not believe I did. I think I said that your model was not validated because
when we called your office, you refused even to send
us the model so we could look at it.

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

MR. ESH: Yes. I --

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

I try to be respectful of your context.
If you don't think that I was respectful of your
context, we can go back to the record and fight over
it. But I don't think it is sensible to cast stones
across the table like this.
I used your terms. Today you shifted your terms and said, "We don't validate models in the traditional sense." Are you saying that site-specific models will be validated or will not be validated?

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

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

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

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

MR. ESH: I clarified it. And the SECY
paper is not our licensing documents. In our licensing documents, it will be clear what we expect with respect to model confidence.

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

Do you want to say something real brief?

MR. CAMPER: I would.

FACILITATOR CAMERON: Go ahead.

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

The information that your organization raised is not subject to FOIA. It is pre-decisional. Therefore, there is no obligation to provide that information. But, as Dave said, any information that is in support of this rulemaking will be FOIA-able and will be public information.

MR. MAKHIJANI: We have not --

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

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

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

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

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

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

This whole business about the availability of GOLDSIM providing a player or more than that, that is an ongoing discussion. And I think that it would...
behoove both the NRC and Arjun to sit down offline to see what access there might be to the player or whatever, but I don't think that we need to argue that out here. And it should be done in as collegial a way as possible within the confines of what the Agency's requirements are.

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

MR. DORNSIFE: No. I just have a question.

(Laughter.)

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

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

In terms of the water pathways, it was a variable in the simulations because the geochemistry varies in the simulations. Uranium can cause significant impacts. If you have animal pathways, lead-210 shows up a lot in the poultry-related pathways, chickens and eggs primarily. And that is
because there seems to be a real sparsity of information related to the transfer factors for lead to chickens and eggs, although whenever I was working on it, I did find a few articles from Nigeria that people were looking at lead to --

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

MR. ESH: Water pathway other than --

MR. DORNSIFE: For the water pathway, yes.

MR. ESH: I'm trying to think here.

Lead-210, which can end up in the animal pathway, obviously gets there in the water pathway and can cause some water pathway exposures, too.

MR. DORNSIFE: Polonium?

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

MR. DORNSIFE: Polonium is not --

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

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

MR. ESH: Yes. I believe we saw polonium. I don't know. I would have to go back and look what
the specific breakdown was, but --

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

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

MR. DORNSIFE: And does the model do that?

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

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

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

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

(No response.)

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

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

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

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

FACILITATOR CAMERON: Thank you. That is from our Office of Research. Thank you very much.
Let's take a break, come back at 10:30. That gives you about 17 minutes. And we will go to radon and other unique waste streams.

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

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

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

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

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

What we are going to do is we are going to
see, to the maximum extent possible, what we can release on the work that we did, the PLAYER model, for example, and other things. So we will continue to have dialogue with OGC. And, to the maximum extent possible, we will make that information publicly available.

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

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

Karen, are you ready to talk about radon?

MS. PINKSTON: I am. Okay.

FACILITATOR CAMERON: All right.

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

Radon-222 has a half-life of 3.8 days. And, unlike other radionuclides in the 238U decay
chain, radon is a gas. This causes it to have significantly different environment ability than the other radionuclides.

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

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

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

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

So this shows a picture that we have seen earlier. And, as you can see in this picture, the radionuclides present in DU or any disposed-of waste can move through the environment by leaching from it.
that can move through the groundwater from leaching or that radon and other gases can also diffuse upward through the cap to the surface.

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

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

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

There is also not known whether future generations would routinely test for radon and install radon mitigation systems in their building. Radon mitigation systems are relatively simple and are
fairly effective. So if a population in the future were to test for radon and install appropriate mitigation systems, the potential for being exposed to large amounts of radon would be greatly reduced.

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

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

So, in order for radon to be mobile, radon must first get from the solid waste to the gas phase. So it is important to understand the amount of emanation of radon from radium in the solid waste form to the gas in the porous space and the factors that influence this.

Another considerable challenge in modeling radon transport is the modeling of diffusion through partially saturated porous media. This diffusion is
highly dependent on the moisture content of the soil. And it is dependent in a highly non-linear way with moisture content. The moisture content of the soil can vary, both temporally and spatially within a site.

Another challenge to modeling radon is the uncertainty in the long-term performance of clay radon barriers. A clay radon barrier will only function as long as it is intact and the moisture content is high. Any drying out of a clay layer would likely lead to cracking and to the barrier no longer working as well.

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

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

NRC staff is seeking public feedback on specifying criteria for a developing guidance related to radon. This includes methods for evaluating and/or regulating the impact of radon gas exposures. We had
some discussion yesterday about whether it would be appropriate to use the mill tailing standards instead of a dose limit.

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

FACILITATOR CAMERON: Thank you very much, Karen.

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

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

MS. PINKSTON: I believe our model was set up just to have diffusion in the gas phase up to the surface. However, there was the ability for it to partition between, the radon could partition between, the gas phase and any moisture located in the liquid. There is also the invective flow downward to the groundwater.

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

MS. PINKSTON: No. We didn't include the
upward liquid diffusion in the model.

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

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

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

MS. PINKSTON: That would be helpful. Thanks.

MR. WEBB: And, of course, what I know, evaporation is highly dependent on episodic rainfall preferential paths. We have used the weather as well, not only adverse conditions but actual rainfall
events, and also, as we talked about yesterday, the barriers. What you have to consider, non-uniform properties, too, David. We talked about that yesterday a little bit off line.

That's it for me.

FACILITATOR CAMERON: Do you have questions for Steve?

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

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

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

We found some with respect to radon emanation, a lot of cases from bare tailings, but we were very much interested in buried sources and data that could be used to constrain or provide support for radon modeling.
We also looked at the radon that is in the environment and how that translates into exposures and houses and the variability that you can get from different conditions.

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

FACILITATOR CAMERON: Anything on that, Stephen?

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

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

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

There are clay deposits, mostly in Tennessee, that are called ball clay deposits. They are small lenticular types of deposits in the relatively near surface in the sediments that are not compacted in the rock. And these things are heavily
mined for use as food binders and in ceramics and so on.

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

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

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

So it seems illogical that one would suggest, at least at the outset, that the standards for radon emissions from a depleted uranium disposal
facility over, say, 10,000 years ought to be the same as a mill tailing site, where you have dramatically more radon to begin with.

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

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

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

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

There was a site in Georgia with a buried clay layer where they had a two-week drought, I think.
And that two-week drought was enough. And it may have had about a meter of overburden above the clay layer. But that two-week drought was enough to dry the clay layer and crack it. And it was no longer effective hydraulically, which would probably mean it wouldn't be effective as a diffusion barrier either.

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

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

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

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

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

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

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

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

FACILITATOR CAMERON: Thank you.
Bill?

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

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

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

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

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

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

MR. DORNSIFE: It would be what?

MS. PINKSTON: The time before that would happen would be a very long time into the future. You would have to have the radon in-grow first. But we would include that type of thing in a performance assessment.
MR. DORNSIFE: Well, again, depending upon the period of performance, it may or may not be important. You know, I mean, if your philosophy for period of performance is a qualitative one, you know, that you say, "Okay. If there is a society in the future that this is what you need to do, then you may want to consider that."

FACILITATOR CAMERON: Okay. Thanks, Bill. Let's go to Felix and then Arjun. Felix?

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

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

FACILITATOR CAMERON: Arjun?

MR. MAKHIJANI: Yes. Just in regard to the period of performance and a related question here,
we would be against changing subpart C in this proceeding.

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

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

FACILITATOR CAMERON: Great. Thanks, Arjun.

Michael?

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

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

MR. DORNSIFE: Well, just to talk a second about what my rationale is, is that if we use the 25-millirem standard, Ma Nature can't meet that. How
the hell do you have a 25-millirem standard for radon emanation?

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

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

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

MR. DORNSIFE: Yes.

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

MR. DORNSIFE: Yes, right. Right.

MR. RYAN: Okay. Just wanted to be sure.

I guess I am a little nervous about the idea that we would mix and match and take something from the uranium mill tailings and take something from somewhere else where the staff is, to my way of thinking, at a clean sheet of paper and try and develop something that is consistent and internal for the problem at hand.

So they may end up in that place, Bill, but I guess I think you would shortchange the efforts they have undertaken so far and are clearly here to gather information to look at the uranium material
question, whether it is uranium metal or uranium oxide
or some other chemical form, apart from the mill
tailings.

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

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

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

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

FACILITATOR CAMERON: Let's hear from --

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

FACILITATOR CAMERON: Let's hear from Diane.

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

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

FACILITATOR CAMERON: That's Dave --

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

MS. D'ARRIGO: Right, always.

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

FACILITATOR CAMERON: Okay. Thank you.

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

FACILITATOR CAMERON: Dave?

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

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

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

MS. D'ARRIGO: So that would mean that there would have to be less of the other? I'm just
not sure what --

MR. ESH: It would mean --

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

MR. ESH: Yes.

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

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

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

MR. DORNSIFE: Or prevent this from going in.

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

MR. RYAN: Again I am stuck with this because it's a really big, huge apples, oranges, and avocados mix here. We are talking about this radon
problem for most new materials as being something that occurs well into the future, past any life of the low-level waste that is disposed.

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

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

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

MR. DORNSIFE: Why would you say that?

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

MR. DORNSIFE: What? Why would you say that?

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

MR. DORNSIFE: Transuranics, you know? Come on. There's a lot of --
MR. RYAN: Dose consequences. The point is the devil is in the details. Just saying, you know, a priori that is the right number, I don't buy it.

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

MR. DORNISFE: I have no problem with that.

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

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

And class A is supposedly only hazardous for 100 years. So that is why I have always been kind of astounded that depleted uranium could now become class A or that anything that isn't, you know, that (a)(6) phrase, that anything that isn't listed in the charts would become class A when class A is only
really supposedly 100 years hazardous. So that has always been one of the issues in 10 CFR 61 that has been a problem.

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

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

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

FACILITATOR CAMERON: We are all for hoping.

(Laughter.)

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

I mean, you know, the concept that everything decays away in 100 years is not valid.
FACILITATOR CAMERON: Okay. Tom, let’s go to you. And then I am going to ask if Stephen has something.

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

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

You can leave them in guidance and save
subpart C for another day, but I think what that does is cloud the issue when you are talking about a performance assessment that is focused on unique waste streams; in particular, depleted uranium, because it is different from what has been traditionally captured under the regulations in part 61. That is why I think it is important to pull that into the regulation.

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

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

So here again I think we have if we look at this big picture and this notion of how does one model these things in the environment, including, as Karen has asked for input, how do we select these scenarios and deal with these other issues, to me you kind of have to capture them all together. I don't think, as Mike said, you can pull any one of them out of the air.
I don't necessarily object to the concept that subpart C is a different matter. I just think you have left a gap if you don't address that today. And it will be a vacuum that some other force will fill given the natural gas behavior of government agencies.

So we either fill that vacuum today or we allow for a wide spectrum of unintended consequences. That is all.

FACILITATOR CAMERON: Thank you. Thank you, Tom. Thanks for tying Mike's concern into all of this.

Steve?

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

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

FACILITATOR CAMERON: Thank you. Thank you, Steve.

Anybody in the audience? You have heard this discussion. And Tom sort of wrapped it up for
us, brought it back to something he said yesterday. Yes, Chen?

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

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

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

But come back to the issue about radon. Radon is a very different animal. I mean, that conversion factor there, you know, will probably become too restrictive for you to be applying to depleted uranium.
So I think that is a very difficult issue that we had to wrestle to see what will be the common measures that you have to define these whole protection issues, at the same time not to be too restrictive in constricting what you will be putting in the waste disposal site there.

FACILITATOR CAMERON: Thank you.

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

MR. ESH: No.

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

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

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

MS. PINKSTON: Right now the DU doesn't contain very much radon just because it hasn't in-grown yet. So if you look at the graph on I think the second or third slide, it shows how much radon would be there from DU over time. And so you don't really start getting any significant amounts of radon
until I think after 100,000 years or so.

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

MS. PINKSTON: Right.

FACILITATOR CAMERON: Okay.

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

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

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

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

Let's go to unique waste streams, see if
we can get that done. And then we will see where we
are, and we will take lunch. Dave is going to tee
this one up for us.

ISSUE 2: UNIQUE WASTE STREAMS

INTRODUCTION

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

So in the 10 CFR, just a little bit of
background, 10 CFR 61 developmental analysis in the
1980s, as I said in my introductory talk, they
considered a variety of waste streams. They separated
them into groups and then different types within those
groups and made isotopic distributions within those
groups and basically did a giant summation of our groups and isotopic distributions and arrived at some inventory estimates.

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

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

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

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

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

So that's it.

FACILITATOR CAMERON: Okay. Thanks, Dave. And I take it from that you said that there could be a number of different components to this discussion or to how the NRC deals with this in the rulemaking.

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

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

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

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

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

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

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

I don't know how workable that is. It is certainly an option, and we are open to all options.
And maybe that is the option we would select, but this seems this is probably an unappreciated, challenging area in this process for us.

FACILITATOR CAMERON: Okay. Thank you.

Let's go to Tom.

MR. MAGETTE: Thanks, Chip.

Actually, this is a fully appreciated, challenging area. I am not quite sure how you do it. I don't think not defined in the original rulemaking means unique. It may have not been defined. That doesn't make it unique. So I don't think that is the right definition.

Arjun has suggested that some of the things that I have proposed are better left for this next rulemaking, the reevaluating part 61 rulemaking. I disagree for a couple of specific reasons in terms of what I think is best done today, but I accept that that is a very rational position.

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

I can't find a way to get comfortable with the concept of other. I don't see how you can put into a regulation "other." I just don't see how you
are going to get a definition that will ever be anything but the basis for numerous long-winded arguments. I just don't think you are going to get there from here.

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

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

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

FACILITATOR CAMERON: Okay. Thank you for that recommendation.

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

MR. KILLAR: Yes. I endorse Tom's comments for somewhat of a different reason. When you go out and start trying to determine what is unique,
there is no clear-cut definition of what unique is. And so by creating a definition of what is unique, you have just created another term and another group. But then you are going to have somebody come back and say, "Well, gee, I think that's over here." And you say, "No. It should be over there. It should be in this unique definition."

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

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

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

So, once again, I am concerned -- and that actually was my discussion yesterday -- that when you
start getting unique, you make sure you are talking about uniqueness of the isotopes, uniqueness of the material, not of the stream it came from, not from the facility it came from, not whether it came from a recycling plant or a fuel fabrication plant or enrichment plant. You are looking at the particular material and the characteristics of that material.

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

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

FACILITATOR CAMERON: Thanks. Thanks, Felix.

Diane?

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

The Sierra Club policy that was adopted
back in -- I don't know if it was the '80s or the '90s -- was to limit the longevity of the waste that goes into a site, into the institutional control period of the site.

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

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

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

So I wanted to just put that out.

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

Michael? And then we will go to Bill and
Christine.

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

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

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

I would say things that fall out of a first pass at a performance assessment kind of approach would be the only way to try and get at it. And there are many examples where unique circumstances
have been evaluated and approved at disposal sites all over the country with that approach in mind.

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

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

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

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

MR. ESH: So if I just sort of can
summarize, you think there are existing processes that handle many of these unique situations appropriately?

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

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

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

And waste streams have evolved from large blocks of very dilute water being solidified in concrete to now very concentrated solid materials. And all of those things have evolved over this 30-year
period. And they have all been handled okay because ultimately it is the inventory that drives the disposal risk.

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

FACILITATOR CAMERON: Okay.

MR. RYAN: Thank you.

FACILITATOR CAMERON: Bill?

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

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

The second waste stream that is very
similar -- and it becomes a problem even sooner -- is
the thorium-232 waste stream.

The third one is the enriched uranium
waste stream.

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

FACILITATOR CAMERON: Okay. Thanks, Bill.

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

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

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

FACILITATOR CAMERON: Okay.

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

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

MR. ESH: I'm sorry. Let me jump in here real quick. I didn't want to say that those approaches that I mentioned weren't the only approaches. They were just a couple of ideas, right. So there are lots of other ideas. Ultimately you want to ensure safety of what you are disposing of.

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

MR. DORNISFE: And that is exactly my point. I mean, based on the methodology you all have come up with, the depleted uranium, you at the very
least need to go use the same methodology to look at these other waste streams that have in-growth and could create potential problems and assure yourselves it was adequately covered. And the uniqueness about DU is that it was not.

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

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

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

FACILITATOR CAMERON: Mike?

MR. RYAN: You know, one way to think about this to me, David, is that there are wastes that are well-understood, well-analyzed, and well within
the wheelhouse of 61. And there are some wastes, uranium, depleted uranium being one, that are not.

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

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

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

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

We do rely on site-specific performance
assessments. And by virtue of that, we establish our waste acceptance criteria. But DOE doesn't enjoy homogeneity in its waste streams.

We have a lot of different waste streams. And the difference in the waste streams has to do with the concentrations and the characteristics, not necessarily the origin, what process originated or created the waste, the waste stream or its specific form.

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

So, first off, I agree with what Mike said, that trying to define what a unique waste stream is is as problematic as trying to define what a significant quantity is. I think it misses the mark. Instead, let's continue on the path of establishing a process where today we work towards creating a framework where site-specific analyses are relied upon.
And then in the future, as Tom suggested, perhaps for the longer-range rulemaking, you consider establishing the process for running special analyses when new or "unique" waste streams require some sort of analysis. I think it really boils down to a graded approach.

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

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

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

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

MR. KILLAR: What I was referring to, when I say, "recycling," I'm talking about closing the fuel
cycle. So we are taking spent fuel, partitioning the various products into recoverable materials that are reused and recycled back into power plants.

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

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

MR. KILLAR: Okay.

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

MR. KILLAR: Well, the answer is similar to what the gentleman from the NRC said earlier. We will look at the characteristics that the waste has to have in order to go into existing disposal facilities. We will do the processing on those materials, those waste streams to make sure that they are consistent with those characteristics that are acceptable at the
disposal facilities.

FACILITATOR CAMERON: Thank you.

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

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

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

MR. CAMPER: Yes.

FACILITATOR CAMERON: Okay. Go ahead, Mark.

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

One of the things that agreement states are all having to deal with now because of -- I am going to use this as an example, a unique waste stream. And luckily it is something that is currently very manageable so far is the need for drinking water.
There are a lot of wells that used to not be used for drinking water because of the limitations of EPA on concentrations of natural uranium and radium.

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

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

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

One of the other things that I will bring up -- I know this is really off the wall, but it needs to be addressed -- availability through the restrictions of the compact system, Low-Level
Radioactive Waste Policy Amendments A.

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

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

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

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

Another thing that Richard and I have been kind of pulled into over the past few years has been homeland security. And this is where I am kind of stretching it, but it is a reality, although extremely remote, that if there was a deployment of an RDD, for example, you could very well have a lot of very low
concentrations of debris and soil that need to be managed and can't be put in an interim storage-type situation.

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

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

FACILITATOR CAMERON: Yes.

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

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

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

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

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

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

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

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

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

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

FACILITATOR CAMERON: Yes. And many
others have suggested.

MR. MAKHJANI: And Felix.

FACILITATOR CAMERON: Thank you, Arjun.
Larry, do you want to? Bill, why don't you just say what you have to say? And then I want to hear from Larry, who can react to all of this and give us his ideas. Bill?

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

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

FACILITATOR CAMERON: Do you want to answer that right now or do you want to confer before you answer it and let Larry go?
MS. GELLES: I am going to simply say that while we have disposed of some pure DU, we would have to go back and look at what the results of the performance assessment runs were.

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

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

FACILITATOR CAMERON: Great. Thank you.

Larry?

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

When we were wrestling with this concept of a unique waste stream when we were preparing the SECY and talking about large quantities of depleted uranium, I think it's fair to say that the staff was perhaps being clever and proactive in looking back at
what occurred when part 61 was put in place years ago
and this issue of large quantities of depleted
uranium. And depleted uranium ended up by default in
class A.

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

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

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

I was listening to your comments. I was
struck by something that the Commission said again
during the LES proceedings. Here is what the
Commission said in order CLI-05-05, blah blah blah.
The Commission stated, "Indeed, when part 61 was
issued, its environmental impact statement explicitly
acknowledged that the NRC might receive license
applications involving disposal of low-level
radioactive waste requiring either an enhanced near-surface disposal method or intermediate land disposal methods. It was and remains the NRC's intent to retain flexibility to be able to address these license applications in the existing framework of part 61 rule. And in the end, the bottom line for disposal of low-level radioactive waste is the performance objectives of 10 CFR subpart C." I think we all know what they are.

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

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

Does that sound like a reasonable thing to go back and say to the Commission, given what I have heard here today about how difficult it is to define a unique waste stream, I mean, Commission, on this issue, you have previously stated that this really does need to be developed on a case-by-case basis up
to and including rulemaking if so indicated. Is that a reasonable response?

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

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

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

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

There is no reason by stellite balls are
not low-level waste except operationally, in handling them, transporting them, getting them to the disposal site, offloading them and disposing them and covering them up. There are some additional issues to address because of the high external radiation dose rates.

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

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

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

Again, I emphasize the disposal risk is not the concentration in the source. It is the total
amount disposed and the results of the performance assessment of that inventory.

FACILITATOR CAMERON: Okay.

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

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

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

FACILITATOR CAMERON: -- not in a real --

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

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

MR. RYAN: Yes.

FACILITATOR CAMERON: Okay.

MR. RYAN: Thanks for that clarification, Chip.

FACILITATOR CAMERON: Yes. Tom?

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

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

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

Mark and then Arjun and Bill.

MR. YEAGER: I just wanted to follow up on Mike's comment about the stellite balls, for example. And we have seen this as the life of the site ended. And a lot of people were trying to get -- as long as we had access to Barnwell, let's go ahead and get these sources out of here. So we had a tremendous amount of sealed sources with tremendous amounts of concentrated radioactivity in them.

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

The issue that I have as a regulator, getting it from point A to point B has been such a -- I look at it from the regulator standpoint and trying to make sure that it is transported safely within those limits that DOT specifies.
You can't imagine how much elemental lead and depleted uranium are used to try to get it from point A to point B. And then ultimately it goes in the ground just for that one little trip for that compliance. And it adds to a different component completely in that disposal facility.

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

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

So it is just something else to consider because it really became -- you know, we even discussed it, Richard and I. You know, we all
discussed it as the end of Barnwell approached and we were getting the submittals. And it was completely within the regulatory framework, perfectly acceptable. But I just had a real hard time. There's just a short amount of time from point A to point B and the impact, the long-term impact.

FACILITATOR CAMERON: Thank you, Mark.

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

MS. GELLES: No.

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

MR. MAKHIJANI: A couple of quick things. Just as a factual matter, the less than five-year radionuclides and cobalt-60 have no upper limit for classes B and C in part 61. So currently they are not limited. They are limited by these practical considerations that Mark talked about.

MR. YEAGER: Just the dose rate.

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

MR. RYAN: There is to some of the other radionuclides in the stellite, though.
MR. MAKHIJANI: Yes, yes. Well, for cobalt-60, there isn't. And for tritium, there isn't. The practical thing in CLI-05-05 is that the Commission affirmed in that that subpart C limits are the things that govern. Whether you are at a deep disposal for greater than class C or shallow disposal doesn't really matter because of performance objectives.

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

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

FACILITATOR CAMERON: Okay. Thank you, Arjun.

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

MR. DORNSIFE: First, a facetious comment. I mean, we could just put all of these problem high-activity waste streams in a DU container, which
is exempt form a shielding standpoint, and dispose of the whole thing.

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

(Laughter.)

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

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

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

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

FACILITATOR CAMERON: Okay. Thanks, Bill. Christine?
MS. GELLES: Thanks. And it's really a question, a clarifying question, for Larry.

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

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

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

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

Clearly we did talk about this unique waste stream concept in the SECY. I don't remember if they word "unique waste stream" in the SRM or not. We will have to find that. So reserve the right. Do you
have that? Yes. Priya, thank you. Priya is always there when we need her.

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

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

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

MR. CAMPER: Well, we talked about it. We talked in the SECY about the need to address this question of unique waste stream. And, as I said a moment ago, what was on our mind, really, was if we are going to proceed with a rulemaking, let's take this opportunity to perhaps not repeat what took place in 1979-1980 and no criticism intended toward those folks. They did a very fine job. But let's learn from that.
My point in listening to all of this was I am hearing this august group say this thing of trying to identify what is a unique waste stream raises as many problems as it does answers.

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

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

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

So I think the answer is this limited rulemaking is going to be responsive and solve any...
unanswered questions about unique waste streams without you necessarily having to define what is a unique waste stream or establishing a separate process for addressing them.

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

Diane? And then we will go.

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

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

FACILITATOR CAMERON: Okay. Thanks, Diane.

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

MR. GREEVES: John Greeves, Talisman International.

Dave started this with looking for a
simple, crisp answer. I think you have found it around the table. The primary criteria are the performance objectives. They trump everything else.

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

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

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

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

Recently I worked on a project that got a special analysis required. It took them two weeks to come up with the answer. Why were they able to get that answer in two weeks? Because they had a
performance assessment up running, available, and they had a process and a protocol to do that. I think it would be very helpful for a future meeting to have that process protocol presented. I just suggest that.

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

Sorry to be windy about that, but --

FACILITATOR CAMERON: Thank you very much, John.

Anybody else in the audience?

(No response.)

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

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

FACILITATOR CAMERON: -- or maybe not an answer.

MR. CAMPER: In keeping with Tom's point
about our natural gas behavior filling voids, in this case, it will be an information void, Tom. I have an answer, but I will tell you before I give you the answer that the answer raises as many questions as it does provide an answer.

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

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

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

So that is an answer to the question that was raised, but, as I say, when you start talking about it raises a compatibility issue, one can envision a litany of other questions that would follow on the heels of that.
MS. D'ARRIGO: Where has it been done?

MR. CAMPER: I beg your pardon?

MS. D'ARRIGO: Where has it been done?

MR. CAMPER: Where has it been done?

State of Utah has permitted class B and class C waste, although the license was withdrawn.

MR. DORNSIFE: What was your reaction to our license --

MR. CAMPER: As I say, this raises as many questions as it does answers. We have never pursued this issue of a compatibility problem. But you asked the question about a state providing a moratorium banning a class of waste. And the Office of General Counsel's view is that raises a compatibility issue.

Now, what does that mean? And how would that play out? And what are the mechanics? And what other questions does it raise? I can't answer them at this moment, but that's why I said before I answer this, it raises as many questions as it answers.

FACILITATOR CAMERON: Thank you. And thank our colleagues from the Office of General Counsel on this.

We are going to go to compatibility when we come back. There has been a number of issues raised about that. So if we need to revisit this
issue, then we will do that.

   How about 1:25? That is a strange time.

   Okay. I know you need that certainty. 1:30. 1:30.

   (Whereupon, a luncheon recess was taken at
   12:19 p.m.)

   FACILITATOR CAMERON: On the record.

   Okay, everybody. Welcome back and if any of you who
   have come in have not filled out a card that's out at
   the desk Gregory Suber has them right here. If you
   could just fill that out, then that will allow us to
   get information to you. You don't have to fill it
   out, but if you do it will allow us to get information
   to you about this subject.

   We're going to go to a very, I think,
   unique and successful part of the NRC program which is
   the Agreement State program and we have Duncan White
   with us to tee it up and it will be a little bit
   longer than the usual tee-up so that he can explain
   some of the parameters of the program and how the NRC
   works with the states.

   Duncan, are you ready to do this? He's
   not ready, but he'll do it anyway. Okay. Thanks,
   Duncan.

   MR. WHITE: Good afternoon, everybody.

   Again, I'm Duncan White. I'm the Branch Chief for the
Agreement State Programs Branch in the Division of Material, Safety and State Agreements and part of FSME.

I'm going to talk about compatibility of agreement states and NRC regulations. As Larry pointed out before lunch, compatibility is a complex issue and just in the 10 or 15 minutes I'm going to talk I'll hopefully give you a little flavor of it and it will hopefully open the discuss up.

Before we talk about compatibility specifically and the role it plays with agreement states and NRC regulations, I wanted to provide some background on compatibility in the NRC's Agreement State Program. The Agreement State Program has been around for about 50 years. This is not new. Congress passed Section 274 of the Atomic Energy Act in response to the states' interest in radiation protection and provided a mechanism to return certain classes of radioactive materials back to the states.

So what is an agreement state? On the surface, it's just a formal agreement between the governor and the NRC chairman in which the NRC discontinues certain authorities and the state assumes the regulation of certain classes of radioactive materials within its borders. The authorities assumed
by the state normally include the regulation of
byproduct, source and special nuclear material that's
in a critical mass. It may also include the authority
to regulate the evaluation of sealed sources and
devices, low-level waste disposal and uranium
recovery.

States have become agreement states for a
number of reasons. Recently, the assumption of NARM
authority by the NRC under the Energy Policy Act of
2005 was a driving force for Virginia and New Jersey
to become agreement states. Really, a motivator for
nearly all states to become agreement states is to
bring the various facets of radiation protection into
one program under one roof.

State regulation allows the state to
exercise regulatory oversight tailored to their
regional or local conditions. Also lower fees in the
NRC and maintaining the funds locally are also a
strong incentive.

Besides the distinction feature of
discontinuing certain authorities instead of the
typical Federal-state relationship of a delegated
program, the Congress envisioned the agreement state
program to promote an orderly, regulatory pattern and
courage the states and NRC to cooperate in the
development of radiation protection standards. Although the NRC discontinues its regulatory authority in the agreement state, it does maintain an oversight responsibility to ensure that agreement states are adequate to protect public health and safety and compatible with NRC regulations.

Now I understand earlier in the workshop there was a question raised about what happens if states, and again germane to here, passes a moratorium to ban certain classes of low-level waste. That's again a very hard question to answer and there's no -- Really I don't really have a good answer for that because it really depends on the circumstances of what that ban or moratorium is. And, without knowing the specific case circumstances, it would be not prudent to speculate anymore on that.

The keys elements of an agreement state program can be summarized into four broad areas. These areas also serve as the basis for the review of an agreement state application for a prospective agreement state: a licensing inspection and incident response program designed to adequately protect public health and safety in compatibility with the NRC regulations; a program that has sufficient staff and technical training to regulate the licensees under
their jurisdictions. Although the NRC does pay for training for inspectors and license reviewers, the state may need to hire an individuals with more specialized disciplines required for seal source and device, low-level waste and uranium recovery.

With the exception of NRC money for training, the states is required to fund their program. This is done with users' fees and for most states some allocations from general funds. And to maintain compatibility with NRC regulations, each agreement state needs enabling statutes and regulations consist with their state's administrative law.

Agreement States play a prominent role in the rad material in the United States. There are currently 36 Agreement States which regulate 85 percent of the approximate 22,000 reactor material licenses in this country. New Jersey is on schedule to become the 37th Agreement State at the end of this month. As already mentioned in the workshop, the four licensed low-level waste sites are located all in Agreement States and the major waste processors in this country are also all located in Agreement States.

As indicated earlier, Congress requires the NRC to maintain oversight of the Agreement States.
This is achieved through the Integrated Materials Performance Evaluation Program or IMPEP. The IMPEP is not only used to review Agreement States, but it's also used to review the NRC's Regional Materials Inspection and Licensing Program and the Headquarter Space, Sealed Source and Device Evaluation Program. IMPEP reviews the performance base and focused on outcomes. The reviews do not look at all activities of the program, but focus on those that have particular health and safety significance. If an Agreement State's performance is lacking in a particular area, the review will examine that aspect of the program and dig deep to determine what the root cause of that performance is.

The IMPEP reviews are performed at least every four years by a team of three to eight NRC and Agreement State technical staff. An onsite review is normally completed in a week but may also require additional review in the office or a longer time onsite.

The team will accompany state or NRC inspectors during the IMPEP in actual inspections of the licensees. The team will look at five common performance indicators for the state or region's Licensing, Inspection and Incident Allegation Program.
Additionally, Agreement States are reviewed for compatibility and for low-level waste, uranium recovery or sealed sources device if the state conducts those activities and has the authority.

The team's report is reviewed by senior management at the NRC and an Agreement State program director before the report's findings are finalized. This management review board is conducted at a public meeting held about three months after the end of the review.

The performance criteria used by the team to evaluate the state or the region's program is detailed in Management Directive 5.6. Management directives contain the policies and procedures that govern the internal NRC functions necessary for the agency to accomplish its regulatory mission. The IMPEP program also has a number of implementing procedures issued by our office that are designed to provide specific guidance to the team on individual indicators.

With that setup, now we can talk about compatibility a little bit. How is compatibility related to what we're talking about in this workshop? As indicated earlier, Section 274 of the Atomic Energy Act requires the NRC to ensure that an orderly
regulatory pattern between the 36 Agreement States and
the NRC be maintained with the NRC regulations serving
as the benchmark for the compatibility requirements.
These require that the regulations of any agreement
state contain no gaps, conflicts or duplications with
the other 36 different jurisdictions.

Compatibility does not mean that
everyone's regulations are the same. It was the
intent of Congress to allow Agreement States to have
some flexibility in regulating radioactive material
under their jurisdiction to accommodate local and
regional concerns.

Compatibility not only relates to
regulation but also to legally binding requirements
such as license conditions and to program elements
such as the program's implementing procedures. The
process that the NRC uses to determine the
compatibility of the regulation, legally binding
requirements and programs elements are found in

So how do we apply this concept of
compatibility? In the Management Directive, there is
an evaluation process to determine the compatibility
category for each section or even subsection of the
NRC regulations that are required for agreement state
compatibility. There are six compatibility categories that can divide our discussion here into three groups.

For Categories A and B, the agreement state regulations must be essentially identical to the NRC's. This means essentially word for word. The basis for each category is different, but the result is the same. An example of a regulation that is Category A would be the basic dose limit of 5 rem per year as you find in Part 20. an example of Category B would be transportation regulations in Part 71.

For Category C, the Agreement State regulations must contain the essential objective of the section or subsection of the regulation. For category Health and Safety, the regulations must embody the essential objectives for health and safety. For these compatibility categories, the agreement state can be more restrictive than the NRC.

This is an example here of Compatibility Category C, the many requirements in the regulations to perform a radiation survey. The NRC regulation may specify how that survey is done and how frequently it should be done. To meet the essential objectives, the agreement state regulation will also require the performance of a radiation survey. That's the essential objective. But the agreement state may
choose to require the survey to be done in a different
manner than the NRC and at a more frequent interval.
This is acceptable and the NRC will conclude that the
state is compatible with regard to this requirement.

For the third category, these are the last
two categories, Category D is not required for
compatibility, but the Agreement States may choose to
adopt the particular section of the regulations.
Category NRC cannot be adopted by the agreement states
since that authority has not been transferred to the
state. An example of the Category NRC would be review
and approval of Type B shipping containers you find in
Part 71.

Here are some examples of compatibility
categories for sections of Part 61. It's not uncommon
for different sections or subsections of one part of
the NRC regulations to contain different compatibility
requirements. As you can see, the agreement states
are required to have essentially identical regulations
for 61.41 and 61.55 but have some flexibility to
impose more restrictive requirements in 61.56.

During the workshop here, we were talking
about the proposed inclusion of a waste classification
specific to DU. When the NRC does propose such a new
classification or if the NRC proposes a classification
for DU under 61.55 the compatibility category proposed by the NRC will in all likelihood be the same as it is now and that's Category B. If the final rule designates the compatibility category as B, then the Agreement States would have to adopt the same waste classification as the NRC.

So how does a performance assessment fit into compatibility? A performance assessment is performed to meet the dose requirements under 61.41 of the current structure and how the Agreement State performs the performance assessment will be part of the Agreement State's implementing procedures. The Agreement State's implementing procedures are part of what are referred to in an earlier slide as program elements.

The Agreement State's implementing procedures for low-level waste are considered Compatibility C. Again, the state has some flexibility in what they can use.

If the Agreement State has to adopt essentially identical regulations for the new DU classification since the NRC has determined it to be Compatibility B, how can the public input into the process? Yesterday, Andrew Carrera provided an overview of the NRC rulemaking process. The figure
here is similar to the one he showed yesterday, but emphasizes compatibility.

The Rulemaking Working Group makes the initial compatibility determination. During the internal review process, the proposed rule and compatibility determination are reviewed by a compatibility committee consisting of senior NRC and Agreement State staff to ensure consistent application of Management Directive 5.9 in the implementation of the rule.

After the public comments are reviewed and evaluated, NRC staff prepares the final rule with the compatibility designations. Before the final rule is published, the Commission will review its compatibility designations. The Commission has the final say on the rule's compatibility.

Agreement State normally have three years after the date the NRC implements their final rule to adopt compatible regulations. The Commission could require a shorter period of time for the Agreement States to adopt compatible regulations. In fact, they did this with the Waste Manifest Rule back in the 1990s.

As you can see from the figure, once the NRC adopts the rule and the regulation is final, then
the Agreement State has to adopt the rule. There is really not much the Agreement State can do to change the language in the rule because of the compatibility or may not be able to change the language in the rule because of compatibility. The opportunity for greatest impact and influence on input on the compatibility designation comes when the NRC is promulgating their rules.

The NRC reviews the draft and final versions of all Agreement State regulations to ensure that they are compatible with the NRC regulations. This process is also applicable to proposed state statute changes that impact the Agreement State program. In addition to the review by the NRC technical staff, the NRC's Office of General Counsel also reviews each draft and final rule.

NRC staff prepares a written response to the Agreement State that is reviewed and signed by NRC management. The NRC review for each agreement state is tracked and is publicly available on FSME public website.

As I said, our compatibility process as well as impact on the rest of the policy and procedures that govern the Agreement State program are publicly available on the FSME public website and that
website is linked from our main website at nrc.gov. The regulation toolbox has a complete breakdown of all NRC regulations required for Agreement State compatibility.

That concludes my opening remarks and answer questions.

FACILITATOR CAMERON: Thank you, Duncan, and there may be more -- it's not only going to be questions obviously, but questions and discussion. There may be more questions about this part of the program. Let me ask if there are questions first before we go to discussion.

Bill.

MR. DORNSIFE: I guess I would ask. Does NRC ever conduct any audits like you require everybody else to do of how effectively these management directives are implemented?

MR. WHITE: Just recently, earlier this year, the IG, the NRC's IG, finished an audit of the Agreement State program itself, looked at various aspects of it and made some recommendations on how to propose changes, effective changes, we may want to look at. So the management directives are just periodically -- Specific questions about management directives.
MR. DORNSIFE: Well, I'm talking specifically whether compatibility requirements are uniformly enforced by all the states.

MR. WHITE: Compatibility is reviewed during IMPEPE and that's one of the things that we do look at.

MR. DORNSIFE: But I'm talking more broadly, you know, look at one state versus another state and the same rules are always being applied the same way.

MR. WHITE: As I said in my remarks, rules may not necessarily be -- have a compatibility designation that allows the states to have some flexibility in how they adopt them and how they implement them. Again, they're not going to be all the same. We don't have -- Everyone doesn't have -- There are 36 Agreement States and the NRC. All don't have the same regulation. There are variations between them. So you could go from one state to another. The same requirement. You may see some differences in them.

MR. DORNSIFE: No. I understand that. You know, my question is more -- Well, I'll give you an example. Even though you say that the waste classification system is Category B and I assume the
nomenclature has changed over the years, but the concept has been there from day one. You allowed Pennsylvania to come up with Class C limits for thorium and uranium. Now, on the surface, that would say, "Gee. That's really going beyond what you're saying is applicable to this particular category."

And I'm wondering out of that is there any management program, whether it be audit or anything, that periodically assesses how well you're implementing your policy.

FACILITATOR CAMERON: How are issues that come up where there might be a potential inconsistency between what one state is doing and another state is doing in regard to a particular topic? How are those issues raised and considered? Is there a mechanism just in the internal management of the program where issues like that might be checked? In other words, when you go out and do an IMPEP review, pretty comprehensive review, is it on your mind that we need to take a look at how the state is implementing this program not just for purposes of comparing it to the NRC requirements but in terms of how other states might be doing that? Does the Organization of Agreement States look at these types of issues?

I think Bill is trying to see how these
issues might be raised, Duncan.

MR. DORNSIFE: Well, just another clarification, Chip, and even more specific, let's say a licensee felt that because of the way an agreement state has been approved to do something that they're at an unfair competitive advantage. Is there a process to get some redress for that issue?

FACILITATOR CAMERON: How would an unnamed licensee approach the NRC on something like that, Duncan?

MR. WHITE: This can be done a couple different ways. One way, sometimes the licensee has approached us directly and indicate that they believe a certain practice in a certain agreement state is not consistent with our policies and we would look into that specifically. Sometimes these things are found, sometimes they're found, during IMPEP reviews where we've found some cases where how the state is either maybe not so much in regulations but certainly how they implement their statutes and procedures. There may be some way they're being inconsistent in that and during IMPEP we would address that and point that out to them.

It can be something as simple if they're licensing something they shouldn't be licensing or
they have a -- We have not looked at a regulation in a long time and they didn't submit it to us and we have to have them change it. I mean it could take various different forms. But it's been brought to our attention in many different ways.

MR. DORNSIFE: But you're somewhat -- I think you're somewhat limited in how you enforce your will upon the states. I mean if they say no, your only option is to pull the agreement and we know that probably isn't going to occur for most issues unless the --

(Off the record comment.)

FACILITATOR CAMERON: And, Duncan, another question that may allow you to comment on Bill's observation is that even when there is a compatibility level that requires something of the states and the regulations you still look at their entire program of implementation to see if that objective, overall objective, is being met. In other words, there is some judgment involved and, in the example Bill gave, there are discussions with the state over what can be done to remedy the situation. Is that correct?

MR. WHITE: Yes. Part of the IMPEP process we do. We could very well make recommendations and again effectively we ask them to
take action to change it and we do track those things. Again, there's been cases where we've tracked recommendations through two or three IMPEP cycles to get them to fix a particular problem.

We had one particular state, for example, who had dose limits, equivalent to Part 20 of our regulations who had dose limits, which were not compatible with ours and we eventually kept on them until they changed them. Again, I don't know why they did that in the first place, but the discrepancy was discovered and we told them to fix it and we kept on them about it.

And again, part of that, sometimes part of that pressure comes from licensees, too. Licensees would look at the -- who have to comply with those regulations were smart enough to know and said, "Gee. That's different from the NRC's and I know that has to be the same." And they may bring it our attention or we would say we would follow up on that. Again, we may do it through IMPEP. We may do it -- look at it separate as a performance concern, again, because we do the IMPEP only like about every four years unless the program has a number of performance issues which we would go back even more frequently.

FACILITATOR CAMERON: And, Bill, I know
you may have more and we'll come back to you. But let's hear from Felix and Diane and Arjun. Felix.

MR. KILLAR: I have two questions to make sure I understand the compatibility issue particularly with the Category C since that's the only one that's allowed to be more restrictive. Under EPA's rules for more restrictive compatibility, states have the ability to do that. However, they have to justify the reason why they feel that their regulation should be more restrictive than the EPA's.

The first question, does the NRC have any such similar requirement that if a state was to put in something that's more restrictive than the existing NRC regulations the state has to justify why they want to provide that more restrictive requirement.

MR. WHITE: No, there isn't.

MR. KILLAR: Okay. The second one which is related because I figured that was the answer to the first one, if a state does have a more restrictive requirement, does the NRC look at the basis of the more restrictive requirement for one purpose and that is to determine if the NRC regulation is maybe inadequate in that area and so that way they felt that the regulation should be brought up to where the state has determined or if they feel that the determination
of the state, the models, technology, whatever they
did to come to that decision has something that
they've identified that the NRC hasn't recognized.

Because I know, we deal with, I deal with
a lot of source and Part 30 materials and we have a
lot of issues, a lot of those, because of the
inconsistencies between states. We'd like to see the
NRC kind of help get some of the inconsistencies
cleared out.

MR. WHITE: Yes. There have been a couple
of instances where the agreement state may have
implemented certain regulations and after a number of
years we've actually changed ours because we've found
out how the state is implementing theirs. We found
out that it's equally protective of the public health
and safety and again it allows existing state practice
to continue and we will change ours. We necessarily
change our regulation. Sometimes we would have to,
but sometimes we may just change the compatibility to
allow a little bit more flexibility for other states
to do that and again it showing that there's a
national program that's kept in place. But again, we
have in case reacted to it that way.

FACILITATOR CAMERON: Great. Diane?

MS. D'ARRIGO: My question has to do with
I think transferability. When an agreement state licenses company, be they processors or transporters — I think those would be the two that I'm thinking of — the way I understand it is that once they get an agreement state license they can also operate in other states.

MR. WHITE: Yes. One of the requirements in the agreement is that the NRC and the other agreement states will recognize another agreement state's license. But the agreement state license they have to abide by the requirements of that agreement state license, again, if it's state law -- I'll just use this for example. There's a Pennsylvania licensee and they go to work in an NRC jurisdiction. They have to comply with the Pennsylvania requirements. They have to comply with the NRC requirements.

Also I should point out that the Pennsylvania license has to authorized licensees to work outside Pennsylvania. Usually it has temporary -- A license like that would have something called temporary job sites. It allows them, authorizes them, to work outside their home state.

MS. D'ARRIGO: Does the state then -- Isn't the licensing the company, but the company is working in their -- Let's say you've got a Tennessee
company that's working in Maryland. Does Maryland need to be notified?

MR. WHITE: In almost all cases, yes.

MS. D'ARRIGO: That's required by NRC? I was trying to figure out where that --

MR. WHITE: Most states require that.

MS. D'ARRIGO: So Maryland would require notification of --

MR. WHITE: Maryland would require --

MS. D'ARRIGO: But it's -- Okay. It's up to the state in which the activity is taking place.

MR. WHITE: Yeah.

MS. D'ARRIGO: So let's say it's not even an agreement state. Let's say they were going into Indiana or -- I don't know. Who is not an agreement state?

MR. WHITE: That's NRC's jurisdiction. They would have to notify the NRC.

MS. D'ARRIGO: And they would have to let you know that I'm cleaning up this facility.

MR. WHITE: Yes.

MS. D'ARRIGO: Okay.

MR. WHITE: That's correct.

FACILITATOR CAMERON: And Arjun?

MR. MAKHIJANI: A question at this stage.
Did the IG's audit find major deficiencies and, if so, what were they?

MR. WHITE: What audit found, the audit recommended doing another lessons -- We had done lessons learned in our program in about 2002. It recommended doing another one of those lessons learned which we're planning to do. It also recommended some changes to some of our procedures to make them more -- to adapt them to some of the issues that have more recently come up.

Specifically, one of them was the pandemic and continued operations. Again, both of the NRC and all the states have pandemic-type plans or COOP-type plans and again IG was looking to see if there was more inaction and more cooperation between the two of them and that was another one of the major findings on that.

FACILITATOR CAMERON: And Tom?

MR. MAGETTE: Duncan, during your presentation, you discussed briefly the notion of a moratorium and how that's a challenging question and it would depend upon the specifics of the case as to what your interpretation would be. Could you give me some examples of either a real or for that matter just a hypothetical case where you would come in and say,
"No, you can't do that" or where you conversing might come in and say -- I don't know what else you would say. If they're not consistent with the regs I'm not sure how you would say, "That's okay."

MR. WHITE: I mean that's a hard one, but one example I guess hypothetically would be that if the licensing authority required the operator of a site to do a performance assessment and they found they can't take any more of a particular type of waste in that site there because the performance dictated that the dose limits would, you know, raise to a certain level that would exceed the regulations. They may require them to and they may stop them from taking in that type of waste. That would be a reasonable thing to do. It effectively shuts off them bringing material in, but that's one possible thing where it might be acceptable.

MR. MAGETTE: But wouldn't you do the same thing? I don't see how that would be inconsistent with how the NRC rule in a similar case if you looked at a performance assessment and said, "Gee, you clearly exceed the dose limits in Subpart C." I mean, I'm looking for a case where you've got -- you're allowing something and an agreement state says, "Well, I'm going to do something different" which in theory
in accordance with the regulations would not be permissible. They would be at risk of losing their agreement state status one would presume and yet you said that it might not always be that end result. It would depend on the specifics. I'm having a hard time understanding what specific case would lead to it being okay if, in fact, it's not consistent with, for example, compatibility Category B. How do you get there from here?

MR. WHITE: Again, I showed the chart on my presentation where the 61.41, the requirements, is Category A. It has to be the same as the NRC. That again — And under our current system to meet that you would easily do a performance assessment to show that you would not exceed that limit. You know, you would use certain modeling and certain of the site and it's very site-specific information to come up with that determination and that may be the basis for them to say, "No, we can't take anymore of this type of waste on the site" for example. That may be their basis for doing that.

MR. DORNSIFE: Just quickly, Tom, I think you have a very good example in the fact that Utah says you can't take B and C and your question will be authorized under the Waste Classification System and
NRC has found that okay.

FACILITATOR CAMERON: Is that a helpful example?

MR. MAGETTE: No.

(Laughter.)

No, I don't think it's necessarily relevant.

(Laughter.)

It's not like we have a license. We didn't apply for a license to take B and C waste, get one and then have Utah say, "We don't want you to take it after all."

MR. DORNSIFE: If you would apply, maybe they would give you one.

MR. MAGETTE: No, we applied and we withdrew it.

FACILITATOR CAMERON: Go ahead, Tom. Finish.

MR. MAGETTE: We withdrew that application. There was no application ever rejected and frankly we think if we were to submit it and it were to be reviewed that it would be found to be technically acceptable. But we haven't gone through that. We haven't done that. So that's why I don't think it's applicable. If they had said, "No, you
can't take B and C after all" and we're sitting there holding a license, I would think that would in fact be an example of something that wouldn't be allowed.

    MR. WHITE: I think that's a good example.
    I mean if you submit an application for B and C waste and that application was technically acceptable and the state decided not to accept it for nontechnical reasons, I mean one could argue possibly that creates a compatibility issue. Likewise, if there was a technical reason for not accepting it, that's a very different reason.

    And they should put it out to people when they apply for -- As you pointed out, people apply for licenses. They apply to do certain activities and they will be authorized for certain activities. They don't get the whole kit and caboodle when they apply for a license. "Oh, we'll give you all this extra stuff, too." That doesn't happen that way and your example is a very good demonstration of that. You asked for Class A and they gave you Class A.

    MR. MAGETTE: Right.

    FACILITATOR CAMERON: Go ahead, Tom.

    MR. MAGETTE: I was just also going to make a comment. I mean if you have a follow-on.

    FACILITATOR CAMERON: Well, I just was
wondering, Duncan, if there's anything that could be helpful to Tom with that question, for example, from the two-person radiography rule where some states were implementing it differently than the NRC which they might not have had the discretion to do that. But they were achieving the objective, health and safety objective, of the regulation and the NRC because the NRC works with the agreement states as co-regulators basically that there's a lot of room for discussion and trying to understand what states are trying to do and eventually I think the NRC changed its rules to recognize that particular practice.

MR. WHITE: Right.

FACILITATOR CAMERON: Do you want to offer anything on that? I don't know if that's going to -- It's a stark example for Tom.

MR. WHITE: Yes. But also I think points out the complexity of dealing with this. Again, when you talk about compatibility, it's easy to say, "It's Compatibility B and these are the rules." That's not necessarily the case.

Again, as I said, it's a partly -- This is why we get lawyers. This is why everything we do is reviewed by lawyers because we want to make sure that we, you know -- We do sometimes get cases where states
come in with something that's not black and white and we have to look at it carefully and decide that. And again in the case of Chip was talking about and that was the State of Texas, Texas in fact we had a different interpretation of the two-man rule than the State of Texas did and we had to come to some -- Once we decided that the Texas interpretation was equally as safe, then we accepted their approach to do that.

Again, the bottom line at the end of the day we're worried about health and safety and protecting people and, you know, we want to make sure that's what we're doing.

FACILITATOR CAMERON: Okay. Tom, do you have some more or should we go to Felix and Diane and come back?

MR. MAGETTE: I just want to make a comment.

FACILITATOR CAMERON: Go ahead.

MR. MAGETTE: And whatever order you want to go in is fine.

FACILITATOR CAMERON: Yes. Go ahead. No, do it please.

MR. MAGETTE: I mean I would like to comment on this topic in general that Bill's raised the question "Should there be a limit of some sort of
acceptable floor?"

"An oakey-dokey level" I think was the technical term he used or you used.

FACILITATOR CAMERON: No, he did. Please.

MR. MAGETTE: Okay. The ODL -- I'm not using the DM (de minimus) word. No Latin here. And without that that we have a complication that we have a problem that there will be some sort of interim state action over the course of this rulemaking.

My suggestion in response to that is I think that we might have that anyway. But my comment is that as I read your current regulations you're talking about a modification of 61.55 in this rulemaking which is compatibility Category B. I presume that a new 61.55(a)(9) would also be a compatibility Category B which is consistent with what you said about changing a portion of your regulations.

I've also suggested that an amendment to subpart C or 61.41 as a part of this process would be in order. That's a compatibility Category A and so that would not be a new section under a new paragraph. So I think it would still clearly all be compatibility Category A.

It seems to me that there's not a lot of latitude for a state to do something different in a
case like this where the NRC is going through a rulemaking that is extensive where you've developed a lot of information, where you've created technical basis, where you're clearly looked at the existing Table 61.55 and said, "We're not changing the classification of depleted uranium." So there seems to be no basis for some other action by an agreement state in the interim and I think that's what I heard Larry say words to the effect of this morning that that classification has not changed.

And so if this is not a case where it would be clear that a state is not allowed any latitude to do something. I don't know what would be. So that's my comment. If there certainly should be such a case where the continuation of current practice should be continued in the interim, the NRC clearly had the opportunity to suggest that that's not appropriate. But we have multiple documents, whether they be orders from the LES licensing case or the SECY-08-0147 or the SRM in this specific proceeding that the NRC has not taken that opportunity.

So I don't think it's reading too much into that to suggest that that's a proper interpretation. And that's my comment.

FACILITATOR CAMERON: And I think that
that's very clearly stated, too, Tom. And, Duncan, I
guess one final question for you as maybe one
observation is that the NRC has not too often been
presented with a case like that.

MR. WHITE: I can't recall anything. One
thing I wanted to comment on just because the
compatibility designation for a section is as it is
doesn't mean it always is that. It can change. If we
do add stuff, we will look at the new addition fresh
and determine if the compatibility category for that
subsection is appropriate or not. If it isn't, we'll
decide with something else.

And again we have numerous examples in our
regulations where we have subsections of a particular
part of the regulations have been different
compatibility designations. So we would have to look
at it again. It all depends on how the rule is
written. Again, we can predetermine what that is
until we see it, until we actually have language to
look at.

FACILITATOR CAMERON: And one issue for
all of you, I mean, when this proposed rule goes out
there's going to be a proposed compatibility
determination in there and people can comment on
whether they think that's the correct determination.
But it's also fair for people to comment that if this is the determination that it should be pretty black and white and should be enforced.

And you're giving us a comment on it now which is helpful. We haven't heard too many comments on in terms of this site-specific performance assessment, what people's opinions are on what level of compatibility and I guess that we don't need to get stuck trying to decipher A, B, public health and safety.

The question is really how much flexibility should a state have in deciding how the performance assessment is done or is it going to be more rigid than that in that it has to be uniform?

Let's go to Diane and Felix and Arjun.

Diane.

MS. D'ARRIGO: This is a question about whether, let's see, an agreement state will, let's say, license facilities that can do things that the NRC wouldn't necessarily allow and I'm concerned. The thing I'm thinking about is Tennessee licensing processors that have the authority themselves to determine whether certain radioactive waste can then go into unregulated facilities.

And I know NRC does that on a case-by-case
basis and it seems to be more generic in Tennessee and we've been told that there are other states that are also doing this and I wanted to -- On the surface, it looks like the state is doing something that's more lax than what the NRC would do. I wanted to hear how that jives.

MR. WHITE: That's something we will certainly look at during an impact review. We look at how they were doing that and what their basis for doing it is. I can't say without knowing specifically what Tennessee does. I really can't say anything more right now about that aside for we would approach doing it.

FACILITATOR CAMERON: And it may be I know that Diane has a lot of questions about the Agreement State Program works that don't necessarily come into play in this particular rulemaking. But it may be helpful --

MS. D'ARRIGO: Will this rulemaking be a change in 10 CFR 61 perhaps or what do you -- what were the constraints of my questions here?

FACILITATOR CAMERON: No, I was just suggesting that obviously there's going to be a change in Part 61 somewhere. I just was thinking about your particular example about how that might apply to this
site-specific performance assessment and I'm not saying it's not a legitimate question. I was going to suggest that maybe some of the things that are outside of this site-specific performance assessment category --

MS. D'ARRIGO: The site-specific performance assessment for depleted uranium and unique waste going into a 10 CFR 61 facility?

FACILITATOR CAMERON: Basically. I'm just suggesting that Duncan may want to talk to you offline about perhaps a broad range of questions that you have about agreement states --

MS. D'ARRIGO: I thought other people here might also have some input on how that works on whether other states are doing similar things.

FACILITATOR CAMERON: Okay. Well, Duncan, I guess you've basically said that you didn't have -- Do you want to repeat what you said?

MR. WHITE: Yes. Sure. That's easy. I think something like that we would look at during an impact review of the State of Tennessee, I mean, how they are doing that. Is this consistent with their procedures and with what the regulations are? That's what we would look at.

MS. D'ARRIGO: Well, I mean, with depleted
uranium, does NRC allow incineration of depleted uranium? I mean, we're talking about DU. So I'm just trying to figure out how the fact that they license the burning of depleted uranium and how that jives with NRC regs. Is that considered more restrictive or less restrictive?

FACILITATOR CAMERON: Did we -- Does the NRC allow the burning of depleted uranium?

MR. WHITE: I don't know.

MS. D'ARRIGO: What was it?

MR. WHITE: I don't know.

MR. ESH: I don't know yet.

MS. D'ARRIGO: You don't know if NRC would allow it.

FACILITATOR CAMERON: Because, yes, I mean certainly we must have an answer for that. Is the incineration of depleted uranium?

MR. ESH: I have no idea. Sorry.

FACILITATOR CAMERON: Dave, we're not getting this on the -- You're going to have to come to the microphone.

Diane, is this based on --

MS. D'ARRIGO: Well, this is the depleted uranium meeting. I have some knowledge of depleted uranium issues in that state which I've questioned.
whether they are more lax, less lax, how that particular amendment that the state gives, how that -- Is that stricter than Federal? Is it consistent with Federal?

FACILITATOR CAMERON: So is Tennessee allowing the incineration of depleted uranium?

MS. D'ARRIGO: Yes, at Aerojet.

FACILITATOR CAMERON: Okay. Larry.

MR. CAMPER: I would suggest that what we do, Diane, is talk with you separately about this and get the facts and examine it and so forth to be able to give you a more thorough answer at the moment. I'm not sure we're prepared to answer the question at the moment.

FACILITATOR CAMERON: Okay.

MS. D'ARRIGO: Okay. Well, it fits into -- it's sort of blurry as to when you've got compatibility whether a state is doing something that is stricter than Federal, less strict than Federal, and I guess I've sat in on IMPEP reviews and they don't always cover the things that I would cover. So I'm not sure how to intersect with that.

FACILITATOR CAMERON: I think maybe the description of blurry is probably a good description unfortunately or as the case may be.
Felix and then we'll go to Arjun and, Michael, you have a comment down there, too.

MR. RYAN: Yes, sure. When you're ready.

FACILITATOR CAMERON: Okay. Then Felix, Arjun and Michael.

MR. KILLAR: Okay. I want to go back a little bit to part of the questioning and clarification that Tom and Bill were talking about and that is that when a state's decisions on low-level waste disposal start changing the playing fields for disposal of low-level waste, does that then become a compatibility issue or not?

MR. WHITE: It may, but again I don't know the specific circumstances. Again, one of the -- I mean things that I'm not very knowledgeable of. I know it what effects it is, you know, compacts. I mean that is an invasion at the time. You know, agreement states were -- The Congress passed a law. I really don't -- So it's a hard question to answer.

MR. KILLAR: Okay. Let me give you two things to think about. In the DOT rates, for instance, interstate transportation of radioactive materials is generally allowed across state borders provided that the regulations are uniformly applied. However, if the state implements some regulations that
are more restrictive such that the transportation ends up having to go around the state rather than trying to abide by that regulation then there is an ability to challenge that regulation as being adverse to interstate commerce and DOT will step in and they'll make a determination of what the intent was for that regulation. Is it not in the spirit of the interstate commerce provisions and is it doing a frivolous thing for the purpose of protecting that state from transportation of radioactive materials through that state?

I would think that we're looking at something similar here and the example I like to give is the example from a number of years ago. In the Central States Compact Commission, Nebraska was elected to be the disposal site for the Compact Commission. Nebraska initially indicated that they would accept that opportunity and a number of activities were ongoing and licensing and characterization and licensing of the site as well as a way to be a final site for final license for -- There was a change of administration of the state and the governor decided that he didn't want that in his state and as a result of that change in the requirement, what have you, to make it basically stop
the whole process and stopped the development of that
disposal facility in that state.

Now what's he done is he actually is going
beyond the capability requirements which you
authorized him to do. But as a result of that,
basically took away a low-level waste disposal
facility.

FACILITATOR CAMERON: But there's no -- Go
ahead, Duncan.

MR. WHITE: It sounds like a Compact issue
and I know that in the case of Nebraska the other
members of the Compact sued Nebraska and they won in
court for them to --

MR. KILLAR: I agree. They won in court.

We got compensation from the State of Nebraska, the
developer. The site got compensation for the costs
that they expended in the development of the license.

But it did not resolve the problem of having a low-
level waste disposal facility in the Compact.

FACILITATOR CAMERON: But even though NRC
has regulations governing low-level waste disposal
that doesn't obligate any state including an agreement
state to site to license a low-level waste disposal
site.

MR. KILLAR: At the same time, it doesn't
obligate them to accept it. The way it's written right now it gives them the opportunity to keep it from being in there in the NRC at this point and the way the regulations are written will not prevent that from occurring. So therefore you are impeding interstate commerce.

FACILITATOR CAMERON: No. I don't know if the NRC would agree with that particular example.

(Off the microphone comments.)

Richard, do you want to say something on that?

MR. HAYNES: I don't think that that's an NRC issue. That's strictly a Compact issue. The Compact has authority over that, not NRC.

(Off the microphone comments.)

FACILITATOR CAMERON: All right.

MR. YEAGER: Well, no. They're using the Compact system as an out. If the state joins the Compact, then the host state has been chosen to be that host state for that site. No other state can have a site imposed on them. That's the protection they're afforded by being a member of a compact. It has nothing to do with compatibility through the NRC.

FACILITATOR CAMERON: That's right. Yes. It's not like the fact that NRC has regulations to
regulate the licensing and operation of a low-level waste disposal site. That doesn't mean that a state is obligated to have the site.

MR. KILLAR: The point that I was trying to make is that the state was a host state. It was going through the process, but as a result of a change in administration they changed their policy and therefore imposed such requirements that it was not practical for that site to be the site.

Now they paid for it dearly. Yes. But it did not resolve in having a disposal facility. So it did impede interstate commerce from that perspective.

FACILITATOR CAMERON: I see where you're going with it. Strict regulations.

Arjun?

MR. MAKHIJANI: I have some concerns in this specific context about site-specific performance and what are the NRC's oversight responsibilities and whether it has been fulfilling them. In the specific instance of DU, my institute so far as I know is the only that has done an independent analysis of the two specific sites at which DU has proposed to be disposed, the one in Texas and the one in Utah.

And in both cases now this is a site-specific analysis, not generic, not what was done in
the SECY paper. Use the standard model. We presented it as expert testimony. We found in all scenarios in a number of different cases, humid, dry, whatever, that the Subpart C limits were violated by orders of magnitude. I mean you're not talking a factor of two. You're talking orders of magnitude, rem or hundreds of rem dose. In most cases, the dose limits were violated around 10,000 years give or take a few thousand years.

We also showed that in one case the license application document contained absurd numbers, more uranium than was ever mined to be disposed of at the site, and in the other case also contained even more absurd numbers, more uranium than the weight of the earth proposed to be disposed of per gram of soil.

FACILITATOR CAMERON: And in Part --

MR. MAKHIJANI: Let me come to the question.

FACILITATOR CAMERON: Arjun, you can use -- It's okay to talk about specific sites as examples for things that are relevant to this rulemaking, but I think that it gets a little bit uncomfortable when we move into the area about allegations about a particular site.

MR. MAKHIJANI: This is not an allegation.
This is -- What I'm about to say is the NRC has these documents. We're happy to supply them to everyone. I just offered them to Dr. Burns. You know, if there is a mistake we will publish a correction. These are not allegations. They're scientific facts. $10^7$ picocuries per gram has a certain amount of weight. If it's in your paper, that means something and you can translate it into a bunch of kilograms. That's not an allegation. That's simply a fact.

FACILITATOR CAMERON: I'm not saying that it's not true. I'm not saying that it's not false. I'm just saying that if there is a generic issue for this --

MR. MAKHIJANI: Yes, there is a generic issue.

FACILITATOR CAMERON: Then let's get to the generic issue.

MR. MAKHIJANI: But it requires a little preface because it has some history. The specific question is all of these facts are known and have been repeatedly been pointed out in various ways to the NRC. I've also explicitly said -- This is not an issue about the sites. It's an issue about NRC oversight and whether the NRC is actually fulfilling its responsibilities and that the Agreement States
happen to sanction things that are unscientific and technically unsupported whether the NRC actually does anything, whether its IG does anything, whether its Commissioners take any action and we have not seen any action for four years despite personally bringing this up with NRC Commissioners, despite presenting it in expert testimony, with the result that even though the only independent calculations that were not challenged by either LES or the NRC or the State of Utah showed that the dose limits would be greatly violated. This proceeding is now looking at shallow land burial as if arid disposal would be okay without ever having properly reviewed the site-specific analysis that were presented and available to the NRC.

I consider this a pretty gross failure of NRC oversight and I would like to know what is the assurance that we have that the NRC's actually going to exercise some oversight over the actual site-specific analyses that are done because I feel in the present instance in both cases it has not done so. I'd like to know what is the process by which the NRC is actually going to regulate Agreement States in these documents that are produce because in the past it has not done it.

FACILITATOR CAMERON: To bring Arjun's
concern into this rulemaking, compatibility level is set for the site-specific performance assessment and it could be a wide range. It could be whatever. How is a member of the public going to be assured that of the NRC oversight of what the state is doing, at least, in terms of those areas where there may not be flexibility for the state to ask? I think that's the question and, Duncan, it's an Agreement State question, oversight of Agreement States. Can you speak to anything there?

MR. WHITE: I guess in the current regulatory regime we have a dose limit that they require to meet for a waste disposal facility and again, as I said, that's the same for everybody. Compatibility A. Again, the state has to demonstrate -- the licensing authority has to demonstrate that the site operator is meeting that and they will use, I guess, appropriate models, appropriate performance assessment tools, to show that. Again, they have some flexibility in how they do that.

Will they do the same stuff as the NRC? I don't know that. I mean maybe some of the other technical people could answer that question. That's certainly the case. What we would review for the Agreement State is that they have their own internal
procedures and protocols and we would see are they following them and are they appropriate.

FACILITATOR CAMERON: You had told Tom beginning of this conversation that if a licensee had a problem with what the agreement state was doing vis-à-vis compatibility, they could bring that to the attention of the NRC. In this case if a member of the public had a concern about what an Agreement State was doing or not doing, is the remedy to contact the NRC Agreement State Program to inquire about this?

MR. WHITE: I mean again they are the licensing authority. They would be best equipped to answer that question.

MR. ESH: So I think the question is when you do an audit of one of these reviews by the Agreement State, do we in any instance do the review in order to do the audit of the review is your question. You could review the process. That's one way to do the audit or you could do an independent review or assessment or essentially do the review yourself in order to do the audit of the review that the Agreement State did.

That's the question that you're asking. To what detail do you need to do that? Do we in this Agreement State what do we need to do to ensure that
MR. MAKHIJANI: No, Dr. Esh. Actually, it is a much lower bar. In this particular case, the items in question, the material in question, was not just introduced as a member of the public and it wasn't introduced to the Agreement States. It was introduced in the context of a license that the NRC was considering granting and in which the disposal of DU from enrichment plants was a very material and central issue.

And the NRC staff lawyer asserted that the reported question that contained the numbers that I've just cited was scientifically sound. And I testified that it contained this information that said it would dispose of more uranium than the weight of the earth. I also pointed this out to an NRC Commissioner and the entire thing was ignored.

My testimony was never rebutted. It was never said that I was wrong. And if I am wrong I will publish a correction. My website has errata on the home page. But even though it was formally presented four years ago, this problem has neither been corrected by the State of Utah and I have presented this to the State of Utah as well nor has it been corrected by the NRC nor am I aware that even a pencil
has been lifted to try to correct it nor have I ever
received a phone call to say what was my problem.

FACILITATOR CAMERON: Okay. Arjun, all I
can suggest to you is that just because an issue is
raised in a licensing processing doesn't mean that
it's going to get into the channel of the NRC that is
going to review the issue in terms of the Agreement
State Program and you can raise that issue with the
Agreement State Program. You can sit in on the public
meeting IMPEP review of the particular state. Those
issues can be raised. I don't know how they're going
to be resolved, but those issues can be raised.

And I want to close this off by going to
Mike and then Tom, hear quickly from Diane and go to
the audience.

Michael.

MR. RYAN: (Inaudible).

FACILITATOR CAMERON: Use the mike.

MR. RYAN: There we go. I apologize, Charles. In thinking about the Agreement States, a
couple of facts strike me. There's something like
17,000 Agreement State licensees and something like --
is it 9,000 or 7,000 NRC licensees?

MR. WHITE: It's going closer to 3,000 NRC
licensees now.
MR. RYAN: Three thousand.

MR. WHITE: And 19,000 Agreement States.

MR. RYAN: Okay. So it's a big difference between NRC licensees and Agreement States. My point is the actions in the Agreement States. So part of the audience for your work products and all the things we've talked about over the two days of guidance and what ought to be in that and all of that is really aimed at Agreement States.

So I would put on your thinking cap and try and think about how you can engage them at this earlier stage of planning and what they might like to see or get in some way. Maybe it's to go to the Conference of Radiation Control Program Directors or other resources like that to get their input and maybe having a workshop like this with them and make sure that you feel comfortable that you have alignment with what their needs might be if when they should or are dealing with low-level waste issues.

I think if you do that early in the process and come up with products that reflect that input the likelihood of being aligned with the review process through the IMPEP program in the Agreement States is a lot higher. So that's my suggestion is to take that very large body of licensees who might be
the ultimate users of a disposal site in an Agreement State and have an Agreement State license themselves and get that constituency's input at an early stage in your process now.

Thank you.

FACILITATOR CAMERON: Okay. Thanks, Mike, and obviously during this initial stage we're trying to get Agreement State input from their presence at the table.

MR. RYAN: Again, I should have immediately added and, of course, with the South Carolina representatives that's one important Agreement State that has a long history on this issue. But there are 34 others now or 33 plus one soon to be added. Thirty-six, okay.

FACILITATOR CAMERON: And Larry wants to say something about this, but I can tell you just from doing the convening for the workshop that the Organization of Agreement States and CRCPD know about the workshop and the issues and Mark actually referenced that when he did his introduction.

Larry.

MR. CAMPER: Mike, I want to make sure a question for clarification, a comment and clarification. When we were developing the SECY, we
did confer with the Agreement States of Texas, South Carolina, Washington, Utah and shared with them the options we were considering and where we were heading toward in what was ultimately Option No. 2. There was a strong and uniform alignment behind that amongst those Agreement States. They favored the idea of imposing a performance assessment for a number of different reasons.

But having said that I think I hear you saying "Well, go talk to all the Agreement States" because they have the users of this material or generators of this material and try to gain a greater insight from the Agreement State perspective.

MR. RYAN: I think that's one aspect of it. The other is keep going with what you started on the SECY process on the technical process. David is developing technical tools. So if the Agreement States are familiar with them, have had input into them, and you've adjusted based on that input whether they're currently a sited state or whether they eventually become a sited state, they'll be more familiar with the tools and techniques that they're going to use to get a license and then ultimately the Agreement State Program will be evaluated against. Do you follow me?
MR. CAMPER: I do, and I think that's why I asked the question. Because if we looked at the probability of additional states becoming hosts for low-level waste disposal sites I mean we don't see much potential out there.

MR. RYAN: Well, if I told you 25 years ago there were going to be so many sited states and low-level waste compacts and three sites left, you probably would have said, "I don't think that." I'm just saying if we lay the groundwork and the technical work products to get input from the Agreement States now they're going to be a lot better later on.

FACILITATOR CAMERON: Okay. Thank you. We're going to go to Tom, Diane, check in with the audience. Go to the next short subject.

MR. DORNSIFE: While you're going through, can I just have one very quick one?

FACILITATOR CAMERON: Sure, but let's go to Tom and Diane first.

MR. DORNSIFE: All right.

FACILITATOR CAMERON: Tom.

MR. MAGETTE: I just want to correct what I think is pretty serious misrepresentation since we're keeping a record here. The notion that there have been two independent and therefore more accurate
assessments of the disposal of the depleted uranium at the Clive site and the WCS site that they've somehow been overlooked or ignored is not true. The conclusions and the expert testimony were, in fact, part of a proceeding and they were rejected by the Atomic Safety and Licensing Board in that hearing.

    That decision was appealed to the Commission and the Commission ratified the conclusion of the Atomic Safety and Licensing Board which included technical experts and also rejected those conclusions. So this notion that there's some extraordinarily valid work floating around out there that's been ignored is simply not the case.

    FACILITATOR CAMERON: Okay. Thank you.

    Diane.

    MS. D'ARRIGO: There is not a disposition pathway now for depleted uranium and in the proceeding for the LES facility we're making the case that there's not a place for that waste to go and that didn't stop the licensing. So there will be a lot more depleted uranium to be dealt with and now we are trying to increase allowed doses or change regulations or find a place to put this stuff and we're talking about a lot more of it than we already have to deal with.
I just think we have to have that perspective on it that the industry does not deserve a blank check to continue to generate waste for which there's no disposal and tweaking regulations here and there and millirems and rems and different criteria in the performance assessments is a fine technical exercise. But the reality is it's probably going to leak wherever it goes. So we're deciding how much is okay to leak and that's a real frustrating perspective when we have a world that has a lot of pollutants that are in there and we're not even beginning to look at the larger picture of the possibility of maybe going forth without producing more known poisons, known toxins, known carcinogens.

That at least needs to be considered and it doesn't seem to be able to be considered in any of these frameworks. We're always looking at where we can allow more allowable contamination, higher levels, itty-bitty little levels but more and more everywhere and I'm just representing the perspective that a lot of people don't want more at all.

FACILITATOR CAMERON: Okay. I think people understand that perspective.

MS. D'ARRIGO: Yes. That's why I'm here.

FACILITATOR CAMERON: And obviously some
people would think that site-specific performance assessment is going to help in terms of preventing release from these sites. Certainly the long-term rulemaking that Larry is going to talk about very shortly will go to that.

Bill.

MR. DORNSIFE: I guess I, unfortunately, started this discussion with I thought was a simple question. Let me rephrase that question to make -- Hopefully, I can get a simple answer. Obviously, when NRC regulates reactors, they are not going to implement their regulations in any way that would create an unfair competitive advantage between one reactor or another.

Does NRC feel they have any obligation either under Atomic Energy Act authority or any other Federal authority that if indeed implementation of their regulations even through an Agreement State Program is creating an unfair advantage that they have any obligation to correct that?

FACILITATOR CAMERON: Duncan, do you have an answer to that? I mean, you've talked about the fact that the NRC in setting compatibility levels looks at perhaps interference with interstate commerce and things like that but that may be --
MR. CAMPER: The Nuclear Regulatory Commission's regulations are designed to protect public health and safety. One of the criteria that we do not consider when reviewing an application for license is whether it does or does not provide an unfair or fair competitive advantage. Simple.

FACILITATOR CAMERON: Okay. Thank you.

And, Arjun, I just have to ask you not to -- I mean you had a statement. Tom responded and I just have to stop it on this point. So did you have - -

MR. MAKHIJANI: A sixty second factual matter.

FACILITATOR CAMERON: Go ahead.

MR. MAKHIJANI: As a factual matter, there was no rebuttal of our technical work that was ever given either by LES or NRC or NRC staff.

As a second point, the license was not based on the rejection of our work or even based on disposal of DU or WCS or Clive, Utah. Ultimately the Commission took refuge in the law that said DOE has to accept DU and the DU estimate of disposal cost would be accepted and that was the end of it. We were not even given an appropriate opportunity to examine all of the details of that. That's how the license was
FACILITATOR CAMERON: Okay. I would just commend people to read the licensing board and the Commission decision on this case and arrive at their own conclusions on it.

Does anybody have anything in the audience on Agreement State issues? Yes, sir. And please introduce yourself to us.

MR. JAMES: My name is David James. I'm with DW James Consulting. I do some consulting work for EPRI.

I just want to make a point. This goes back to the Atomic Energy Commission, but I think it was in 1972 or '73 the State of Minnesota applied higher discharge/low discharge limits than what the NRC licensed and the NRC took issue with it and went to the Supreme Court I believe and the State of Minnesota won the case. So the reality is that any time the state wants to apply higher limits they probably can. That's the main thing.

The other thing was every atom of U_{238} that is being disposed here has always been on this earth.

FACILITATOR CAMERON: Has always been what?

MR. JAMES: Has always been on this earth.
FACILITATOR CAMERON: Okay. Thank you.

Okay. Larry, long-term rulemaking, waste classification.

MR. CAMPER: Thank you, Chip.

Yesterday during my opening comments I pointed out that this is a two-step process. What I'll talk about now is the second step which we refer to as "The Long-term Rulemaking on Waste Classification."

The second part of this rulemaking effort as I said is what we're calling a longer-term rulemaking. The text from the SRM says specifically the Commission directed the staff to propose the necessary resources for a comprehensive revision to risk inform the 10 CFR 61 Waste Classification Framework with conforming changes to the regulations as needed using updated assumptions and referencing the latest International Committee on Radiation Protection Methodology (ICRP). As part of this effort, staff will identify any corollary or conforming legislative changes necessary to support this rulemaking, if any, as well as recommendations on how to proceed absent such legislation being enacted and other agencies that may be impacted by any changes.
This effort should explicitly address the waste classification of depleted uranium. In addition, this effort should include the performance of a technical analysis for public comment concerning the disposal in a near surface facility for any long-lived radionuclides, including uranium. This analysis and the resulting comments should inform the staff's eventual recommendation to the Commission on an appropriate generic requirement addressing such disposals.

This revision would likely involve different, updated methodologies and assumptions in the Part 61 methodology for key variables such as disposal configurations, performance periods, institutional control periods, waste forms, site conditions, exposure pathways and receptor scenarios. This effort would explicitly address the waste classification for depleted uranium as I mentioned and it would reflect current knowledge of the performance of low-level waste disposal facilities and would present risk-informed concentration limitations for all radionuclides, not just selectively for depleted uranium. This revision would accurately represent our increased understanding today rather than relying on the Part 61 analysis conducted approximately 30 years ago.
An update of the methodology used to develop the concentration limits could result in higher or lower concentration limits than currently used which could actually increase or decrease disposal options for some types of waste. For example, current Class B/C waste could become Class A waste perhaps.

As part of the staff's evaluation, we would consider the International Waste Classification System as well and see if it is applicable to our low-level waste environment here. Internationally, they have a different classification scheme with six classes of waste as depicted on the slide. Internationally, countries have stressed the role for site-specific performance assessment. The IAEA published a Safety Guide No. 111-G-1.1 that is about to be updated for the 1994 edition.

The updated version distinguishes between LLW and Intermediate Level Waste (ILW) for long-lived alpha emitters like U$_{238}$. The guide says that "national authorities should establish limitations for the disposal of long-lived radionuclides for near-surface disposal based on safety assessment of a site-specific disposal facility." The guide also states
that "a very definitive boundary between ILW (Intermediate Level Waste) and LLW cannot be provided. Waste acceptance criteria for a particular facility will be dependent upon the actual design of and planning for a near-surface disposal facility, for example, engineered barriers, duration of institutional controls, site-specific factors and so forth."

It is important to note that overseas most countries have not disposed of significant quantities of DU. According to a 2001 NEA report, "Management of Depleted Uranium," all of the major nuclear fuel producing countries are storing depleted uranium with expectations that an eventual use will be found for it. In the U.S., NRC's policy is that the generator can determine if there is a use for their depleted uranium or when in fact it becomes waste.

As we proceed into this longer-term rulemaking and I mentioned yesterday that it's currently in budgeting place planned for FY 2011 to start it, FY 2011, we would certainly plan to have additional workshops to collect your input throughout the course of that particular rulemaking and hold a number of technical and legally oriented workshops to consider all the various viewpoints.
Because of the scope of this long-term rulemaking is large, there would certainly be significant opportunities for public comment. I do think it is fair to say that when we move into this longer term rulemaking to risk inform the waste classification scheme of Part 61 that that would generate a tremendous amount of interest and I would envision, for example, that that rulemaking would probably take minimally three to four years.

I think I'll stop right there and see if you have any questions or discussion.

FACILITATOR CAMERON: Okay. Thanks, Larry. I would just note that from the parking lot that yesterday morning Arjun raised the issues that all options should be considered in this rulemaking including the change in waste classifications. And, Arjun, am I representing that correctly what you said?

MR. MAKHIJANI: Well, yes. If you're going to have a risk-informed rule. I'm not endorsing that we should revisit this regulation, but since the NRC has decided to revisit it I think we should revisit it fully. And just to clarify since the question has come up, I will simply say that we are now investigating the whole framework of all environmental health protection and it's our view at
the Institute that so far all this regulation takes the point of view of the polluter because it follows a single pollutant and does not take the point of view of the public which receives all pollutants or a number of pollutants at the same time and therefore is not concerned with health protection.

I would ask that any risk-informed process take the point -- I recognize that we need to follow pollutants in order to regulate them, but that doesn't mean that we can ignore the public just because we can't understand synergies, for example, and that any new process especially as it will set a precedent for lots of other processes consider the point of view of the public, specifically, that they are exposed to chemicals and radiation at the same time.

And we will be publishing a report on synergisms in the coming months and I would be happy to send it to you. I've already mentioned it to people in the NRC and the EPA.

FACILITATOR CAMERON: Thank you, Arjun, and I think it would also be useful to send it to Dan at the EPA.

MR. MAKHIJANI: We are in communication with the Office of Radiation and Indoor Air about this and I've already committed to send it to them. The
report is not yet complete and has not yet been reviewed. So in the coming months when it's done, we will send it.

FACILITATOR CAMERON: Okay.


MR. DORNSIFE: I guess I'm troubled if the decision on whether this material is suitable for shallow land disposal is going to be made after a decision on what to do. In terms of disposing it as shallow land burial, what happens if we determine it's not suitable for shallow land burial after we've disposed of it?

MR. CAMPER: Well, Bill, the material that we're talking about, of course, now near-surface disposal I mean as I mentioned yesterday and I had a graphic that showed that and I don't know if Patty will use that slide -- no, I guess you're not -- but I had a graphic yesterday that pointed out under the long-term rulemaking DU that gets disposed of between now and then will need to be specifically addressed in the long-term rulemaking.

Now what will that say? I don't want sit here and try to prophesize. What I do know is that it's not uncommon at all when rules are created that
things are not retroactively addressed. They're grandfathered if you will. That is a possible outcome of this. No one has said directly or implied that there would be a requirement to go and dig this depleted uranium up. I didn't say that yesterday and we're not suggesting that now. What I am saying is that the long-term rulemaking clearly in the statements of consideration would need to specifically address that DU which has been disposed.

FACILITATOR CAMERON: And is it possible that one result could be, one option is, that the site-specific performance requirement would take care of the issue?

MR. CAMPER: That's a -- Yes, I was going to say that next. I think that's a very good point. I think what you have to bear in mind when you ponder this question is that whether it be depleted uranium which has been disposed of today presumably has been disposed of safely. There has been a performance assessment conducted. Depleted uranium which would be disposed of between now and then, we yesterday pointed out, for example, that we think it would be prudent to reexamine performance assessments.

I mean the material that would be disposed of between now and the time this revision of Part 61
would occur would presumably have been disposed of safely in a manner that protects public health and safety.

FACILITATOR CAMERON: Let's go to Tom and then to Christine and then we'll go across the way.

MR. MAGETTE: I have a question, Larry.

MR. CAMPER: Sure.

MR. MAGETTE: You made reference to DU disposed of between now and then. What about DU disposed of prior to now? I mean if you start looking at what's already in a site it's not just the currently operating sites that might be in that dataset, Maxie Flatts, Beatty, West Valley, Sheffield. Are you going to require something of them possibly?

MR. CAMPER: Again, I want to sit here and preordain what the final rule would say about previously disposed of material. What I do know as I said before is it's no uncommon that this type of activity is grandfathered under the assumption and verification that it was, in fact, disposed of safely previously.

But clearly the long-term rulemaking would need to address this particular question straight on in the statements of consideration. I just don't want to prophesize as to what I would say.
FACILITATOR CAMERON: Christine.

MS. GELLES: I would offer once again that perhaps the Department of Energy has some experience on these sorts of matters. I'm thinking of the change in the definition of transuranic waste and given that this rulemaking would be a risk-informed rulemaking I think one way in which it could address not just previously disposed of DU between today and five or six years from now or any DU or any waste stream where it's impacted by a revised classification scheme would factor in the risk associated with exhuming previously disposed of wastes. So again we have that experience in terms of dealing with pre-1970 transuranic waste if such a waste classification actually exists. We look forward to being in dialogue with you on that as well.

FACILITATOR CAMERON: Thank you.

Do you have anything on that?

MR. CAMPER: When you have any more questions, I have one more final comment I wanted to make whenever you're ready.

FACILITATOR CAMERON: Diane.

MS. D'ARRIGO: You probably know, but we will continue to oppose exempting radioactive waste and declaring very low-level waste not radioactive enough to regulate. Just a reminder.
FACILITATOR CAMERON: Okay. And Felix.

MR. KILLAR: So on the other side of the coin we assume that as you go forward and start looking at this material as previously been disposed you'll take into consideration backfit provisions for the material that came from a Part 50 site and a Part 70 site and a Part 76 site. I realize Parts 30 and 40 right now do not have backfit provisions, but they are moving in that direction. So I think you need to think about the impact and include that in your analysis.

MR. CAMPER: You are absolutely right. Backfit types of considerations go into reaching a position as to what has been disposed of previously. I mean, you're right.

FACILITATOR CAMERON: And, Bill, and we're going to take a break after this.

MR. DORNSIFE: I guess I didn't catch that, but in this extended rulemaking are you considering the issue of very low-level waste and alternate disposal?

MR. CAMPER: In this particular rulemaking?

MR. DORNSIFE: Yes.

MR. CAMPER: That's a very interesting
question as I said a moment ago. I mean the Commission gave us a particular direction at this moment in time to budget for risk informing the waste classification scheme. That was the direction. We assumed as we said yesterday that to budget for it is to proceed unless the Commission would direct us somewhere along the line not to proceed.

I think what's interesting is when you start to examine Part 61 with the idea of risk informing the waste classification scheme it's going to raise a litany of questions not unlike the ones that you're alluding to here, Bill. I think, I've always thought, that once you went into Part 61 unless you had a very specific narrow focus in the rulemaking like this limited rulemaking is, but once you go beyond that and I think once you start to open up Part 61, it will raise a lot of questions.

And I think, therefore, for a myriad of reasons, some of which are purely economic, some of which are public concerns, various stakeholders' views, it will become I believe in my personal view a very complicated regulation that will open up a lot of questions. And maybe that's not a bad thing. I mean maybe that's the way it should be. But we shall see.

And, of course, what we'll try to do as we
proceed down this path and we begin to see those kinds of issues emerging we'll make it a point to communicate with the Commission on a regular basis to make sure they understand how this is starting to shape up and what the implications are and what would you like for the staff to do about it.

MR. DORNSIFE: Just another question quickly.

MR. CAMPER: Yes.

MR. DORNSIFE: In the international community, how do they typically deal with these waste streams that are lower than low level?

MR. CAMPER: In the international classification process, there is an exemption. There is a clearance level if you will.

MR. DORNSIFE: Right.

MR. CAMPER: An exemption. That's actually one of the categories, exempt waste. We don't have exempt waste as a waste category. What Diane was referring to I think is the fact that under our 20.2002 process which is a pathway in Part 20 that says you may seek approval to dispose waste by some means not otherwise authorized in the regulations. Very low levels of waste with very minimal dose limits typically on the order of a few millirem.
MR. DORNSIFE: You have obviously --

FACILITATOR CAMERON: Bill, you have to talk into the mike.

MR. DORNSIFE: Some concentrations.

MR. CAMPER: We do.

FACILITATOR CAMERON: You need to talk into the mike.

MR. DORNSIFE: You have exempt concentrations.

MR. CAMPER: Yes, we do.

MR. DORNSIFE: That are then related to waste.

MR. CAMPER: That is true. We do. But in the case she was referring to we do grant exemptions of certain cases when the 20.2002 process is followed. I think that's what she was referring to.

FACILITATOR CAMERON: Okay. Christine.

MS. GELLES: I think this is a quick question, Larry. I agree with you that as you start to look at Part 61 it opens up a lot of issues ranging from the very low activity waste as well as up to where does it end. Does it end at intermediate level waste or does it start to creep into Part 60?

MR. CAMPER: Well, again, a great question. At the moment what the Commission has
directed us to do is to proceed with a rulemaking that
would risk inform the waste classification scheme and
I read you the specific directions to the staff. That
is the charge to the staff at the moment.

Now what will happen is as a practical
matter once you head into that particular rulemaking
we're going to start to have workshops, have public
discussions and the very kinds of questions that
you're raising and that Bill is raising will be
raised. And I suspect what will happen as a practical
matter is the staff will be communicating with the
Commission along the way and we will making some
adjustments or seeking permission to make certain
adjustments in the assignment and it will be a
dynamic.

But at the moment the SRM says to do what
I said to do awhile ago. But might that change along
the way? I suspect that's certainly possible.

FACILITATOR CAMERON: And Arjun.

MR. MAKHIJANI: Just a couple of things
quickly. In one case in Idaho, the DOE is actually
exhuming some varied transuranic waste currently in
Pit 9 I think if I'm not mistaken.

The second thing is to the best of my
understanding in the European or some of the European,
British and French I think, the intermediate level waste which is required to be disposed of at non service and deep disposal some of our Class B would fall into that category and certainly Class C waste, long-lived Class B and Class C waste.

And in the final comment and then followed by a question is the current regulations, many of them, 25 millirem per year if you take it as whole body does not correspond to our risk level of $10^{-4}$ to $10^{-6}$ over a life time. In fact, it's considerably more than that as you know and if we're going to go to something risk informed, we would expect that the lifetime cancer incidence risk would stay within what the government has been telling the public but not actually implementing. My question is do you have a range of lifetime cancer risk that you are targeting that you can tell the public.

MR. CAMPER: Our current dose-based approach is different than the risk-assigned approach that the EPA uses in the $10^{-4}$ to $10^{-6}$ that you're referring to. They use a different approach.

Now I think for the moment the best I could answer your question would be as we look at a risk-informed examination of the waste classification scheme the mindset that we go into that particular
rulemaking undertaking and I just gave one example here of looking at the international approach is we have to go into a risk-informed revision of Part 61 Waste Classification Scheme with an open mind. I think we have to explore all those kinds of options and form views and communicate with the Commission along the way as to how it would like to go.

Otherwise, I think we would be sort of preordaining or prejudging the outcome. I think the staff will be looking at all possible options.

FACILITATOR CAMERON: Okay. Thanks. We're going to go to the audience now. But just for information, the SRM you mentioned was SRM SECY-08-0147 and it is on the website that was posted for this.

Any questions on here on long-term classification rulemaking? Anybody? (No verbal response.) Okay. We don't have a whole lot left to do, but why don't we take a break for 15 minutes and then we'll come back and we'll try to finish up with alacrity. Off the record.

(Whereupon, a short recess was taken.)

FACILITATOR CAMERON: On the record. Okay. We're going -- I don't know if we're going to
close out fairly quickly. We have some issues to
discuss. But we had this topic, Other Considerations,
on the table and the three issues that were going to
be discussed there have already been discussed. One
was the thing we started off with this morning on what
happens in the interim and we got lots of input on
that.

The second issue was what do you do with
the existing inventory at a site where there's a
proposal to dispose of more DU and I think that was
covered in terms of source terms a lot of other times
during the meeting where you have to consider that in
your performance assessment.

The third one was something that we
originally weren't going to which was the Maxie Flatts
situation which is sites that are not anticipating to
have DU there. What's the impact of this particular
rule? Tom asked that question and I believe we had an
answer for it. I don't know if it was a satisfactory
answer or not, but basically we've done all the other
considerations. Although if anybody wants to speak
some more on those, we can do that.

But, if not, I was just going to go to
some parking lot issues to make sure we covered them
and then ask for any final comments around the table.
and have Larry close the meeting for us. Arjun, I was just saying that I think our other considerations have been handled. What happens in the interim before this rule is final? We talked about that and other issues.

MR. MAKHIJANI: Just one minor point. I have the French regulation.

FACILITATOR CAMERON: Oh good.

MR. MAKHIJANI: I will give a copy to Dr. Esh and do an informal translation for him. But I have a few other copies for whoever might want it.

FACILITATOR CAMERON: Thank you, Arjun. And please see Arjun on that.

And Patty.

MS. BUBAR: I just wanted to clarify. We did put this agenda item on the agenda, Other Considerations, anticipating that we would want to have some discussion on all these topics that Chip just reviewed and we didn't see them fitting so nicely into the items that we had put on the agenda, the technical items based on the questions or the items that were in the Federal Register notice.

For consistency purposes, we've got the same agenda proposed for Salt Lake City. So we'll keep this Other Considerations on the agenda for Salt Lake City, but I think it was good the way it happened...
at this workshop where these items really got
discussed when it was appropriate based on what the
members of the roundtable wanted to talk about or when
they wanted to talk about it.

But for Salt Lake City we will keep the
agenda as it is and it may end up being just like this
where we address those items throughout the two days
and then don't really have any other considerations.
It will be our time for getting to the parking lot
issues.

FACILITATOR CAMERON: Okay. Thank you,
Patty, for explaining that. Christine.

MS. GELLES: Thank you. Patty, the one
thing I just wanted to ask was a clarifying question
in terms of the NRC's expectations. I mean I know I
heard Larry talk about or maybe it was Dave talk about
mining the transcript to get the input. But I also
heard a request for some written information and I
just wanted to be clear about your expectations
because the Department of Energy will evaluate whether
or not we'll provide some written input, but we do not
intend it to be a line-by-line response to the
questions that were in the Federal Register because we
felt the flow of the discussion here in the meeting
according to the agenda was at the appropriate level
to get at the core issues rather than those more
detailed questions that were in the Federal Register.

I just wanted to be up front about our considerations
and potential plans and get your reaction to that if
you wanted to offer one.

MS. BUBAR: Okay. Thank you.

MR. ESH: Yes, that's helpful. If people
want to submit written information, we will certainly
take it and we will use it. Basically, we'll use
whatever information we have available whether it's
the transcript, whether it's our meeting notes,
whether it's written information. And certainly if
you want to submit something in writing to us you
don't have to address all the questions. You can
address whatever the issue is you want to including
your own issues that were maybe not on the agenda. So
you're free. You have a lot of flexibility here.
We'll just the information the best we can.

FACILITATOR CAMERON: And for the comment
period, it closes when? October 30th. We will be
having the meeting in Utah September 23rd and 24th.
The participant list for the Utah meeting is on the
website and I hope everybody has the URL for that.

And let me just go through some parking
lot issues that remain. I think we've addressed a lot
of these issues. One of them was brought up very
early by Arjun which is a response from the NRC to
issues raised and from my discussions with the staff
on this issue and I'm going to have them correct me if
any part of this is incorrect and this ties into
another issue which is what is the Commission going to
hear about this meeting. I think the staff is going
to summarize notable issues from this meeting
including people who might have expressed disagreement
with this is the right route to go in terms of the
rulemaking and is going to submit that to the
Commission and, Larry, Patty, is that something you
think will be able to find its way onto the public
website at this point or are you still debating about
that about whether that's feasible?

MS. BUBAR: Larry can correct me if he
disagrees with how I'm describing this. But you're
right. We will get ourselves together and share our
observations as well as maybe look at the transcript
if we can get it in time and in between now and the
Salt Lake City meeting we will have a summary, a quick
summary, prepared of what we heard just so that we
want to make sure we're as prepared or better prepared
for Salt Lake City to address some of these issues
that we anticipate coming up.
As far as what we will tell or if we will tell anything to the Commissioners, I think we're still deliberating that internally as to whether we'll do that in between now and the Salt Lake City workshop. Certainly, we'll give them a note tomorrow morning that will say that we had the workshop. You know, participants were here and really good issues were raised, things like that.

But we'll deliberately get ourselves together, all the staff that were here, and make sure that we clearly understand what are some of the issues that we have to be prepared to continue to discuss for the Salt Lake City workshop. But I don't know that we have any answers to when we will communicate with the Commissioners.

FACILITATOR CAMERON: All right. Thank you, Patty.

This issue was answered by Larry, but I just wanted to make sure that everybody understood this, the issue of whether an environmental impact statement should be done for this rulemaking. And NEPA, National Environmental Policy Act, does apply to major Federal actions including rulemaking.

Larry noted that the first step is to do an environmental assessment and in that environmental
assessment is a determination of whether there should be a full-blown EIS. Questions came up about the timing of that. In some cases, that EIS/EA is done when the proposed rule is published, but because of the amount of preparation involved I think the staff is going to have to think about what's feasible, when that is to be done. And, Larry, do you want to say anything else about that?

MR. CAMPER: No, I think that's a pretty good summary, Chip. I mean when you step through the environmental assessment process you trip to at some point either a, FONSI, a finding of no significant impact, or the need to, in fact, conduct an environmental impact statement. The staff would step through that process.

You have a regulatory basis to develop. You have the rule to develop. And you have the environmental assessment to do. Those are generally done in parallel for the obvious reasons because one of those affects the other.

But you're right. I think we'll just have to wait and see as we progress further down the road and actually get into the development of the rule just how that will come together. But clearly we will be doing an environmental assessment. It may or may not
result in a full-blown EIS and that's a function of
the process.

FACILITATOR CAMERON: Thanks, Larry.

The one issue that was in the parking lot
that I'm not sure that we gave a clear answer to and I
see Duncan is gone, right? Okay. Well, did you all
get a clear answer? I mean a clear question was
raised. Is NRC guidance an element of the Agreement
State capability? Did we answer that? It was a
parking lot item and I thought it would be taken care
of during Duncan's but I'm not sure we got there.

MR. CAMPER: Well, I actually did discuss
it with Duncan when he was here. He just didn't bring
it up. I made the point yesterday that when developer
may rule and Duncan did have some information in a
slide that talked about the various types of
compatibility that are assigned and so forth.

The rule itself carries with it a level of
compatibility. A particular guidance document, a
NUREG, if you will for example, is not assigned a
level of compatibility. But what does happen is the
NRC staff and Agreement State representatives work
together in a working group in formulating that rule
and, of course, there's a great deal of coordination
that goes on with the Agreement States in the course
of doing that. And similarly when guidance is created, that working group or a working group consisting of NRC and Agreement State regulators work together to develop that guidance.

Then the question becomes one of the IMPEP process and there's the state. There's a review of the rule itself that the state will develop to address the question of compatibility that is reviewed and then in the course of conducting of the IMPEP and looking at a vertical slice of how the state is implementing a particular regulation. That level of compatibility is reviewed and how is that going. But a guidance document itself is not assigned a level of compatibility.

FACILITATOR CAMERON: Okay. Thank you, Larry.

I'm just going to go around and start with Mike to see if you have any final observations for us on anything that has been discussed and let's go to Mike. Dr. Michael Ryan.

MR. RYAN: Thanks, Chip. I guess what I'd like to offer is a thanks to the staff for preparing a really thorough two-day workshop. You know, I think we've covered a large number and all the significant ones from my perspective on considering how to move
forward on the DU question.

I think we've had robust discussion on how some of the things that might come as work products from this effort could apply to other aspects of low-level waste and the connection that some of these things have to other issues in low-level waste. I really appreciate everybody's presentations and responsiveness in the dialogue of all the panel members. I think it's a success from my point of view.

FACILITATOR CAMERON: Thank you.

Greg?

MR. KOMP: Yes, I would also second that thought by Mike. It's been a very good workshop, very informative and I thought we got to the meat of a lot of the questions that are germane to this process.

I would like to leave a final thought that just a reminder that we are concerned with the variety of waste streams, DU, everything from like we talked about from the enrichment process. We do have some of that we are left sometimes liable for as with -- a couple years ago all the way through pure DU metal and everything in between probably.

Thank you.

MR. MAKHIJANI: Yes, I really think this
was a very productive workshop. I really appreciate how you moderated it and I think I want to thank especially Dr. Pinkston and Dr. Esh for the clarity of their presentation. I know it must have been a little stressful sometime with the exchanges, but I really think they couldn't have been the way they were if your presentations weren't technically thorough and I really appreciate that and I want to say that for the record. I appreciate that a record was made.

And I think I would appreciate if an EIS were done in this process. I think an EIS is required by how huge these issues are. The alternatives need to be properly considered.

And the one big concern I leave with is that the present process has set us on a course that is really leaning toward shallow land disposal in a way that our research over many years, a decade and a half about, on this subject indicates not appropriate for depleted uranium in large amounts. And I'm very concerned about that and I think the option of deep disposal in a WIPP-like repository ought to be part of this process and a consideration of the alternatives or I would find it disconcerting if it were not included.

Thank you.
MS. D'ARRIGO: I am coming away with an even greater concern about depleted uranium than I had before. Also as usual I'm very concerned when proposed rules are going to come out that allow for clearance or deregulation on the low end and do appreciate the opportunity to meet people and talk about that.

I also feel like in reflecting to the Commission the responses from the meeting there aren't as many critics as there are and I just think the stakeholder balance is as usual a little skewed. So keep that in mind.

MR. KILLAR: I'd like to certainly thank the NRC for conducting the workshop. I believe that throughout the workshop the NRC did a commendable job of explaining the issue and providing clarity on the topics that were presented. I certainly like their openness to take into consideration the various aspects that were presented particularly as we talked about the issues which should be a rule versus which should in the guidance documents and I think that was very effective.

One of my major concerns with this is coming up with a definition of a unique and I think that was very well handled and I think that the
potential path forward looks fairly positive from my perspective at least. So I think from my perspective it's been a very successful workshop.

MR. YEAGER: I appreciate the opportunity to attend the meeting. I'll defer the comments on behalf of South Carolina to Richard, but I do look forward to facilitating contact between the appropriate folks to get CRCPD and most of those folks are also members of the OAS. So hopefully we can get further interaction between states that have experience and can bring that to bear as far as assisting in the process.

MR. HAYNES: I would say thank you to NRC for providing the conference. I also want to make sure that Chip and Priya get praise for setting this up and handling it, too.

Just to go on the record for South Carolina, we still support the site-specific PA and also would strongly encourage the time period that is the performance assessment be clearly outlined whether it's rule or in the guidance.

Thanks.

MS. GELLES: Thank you. I was waiting to be called upon.

(Off the record comments.)
I first want to say that I very much enjoyed being a part of this workshop. So thank you very much for the invitation. I'm honored to represent the Department of Energy and hopefully it is obvious now after two days of me beating this horse that the Department of Energy applauds the NRC's efforts to move towards a risk-informed, graded approach, one that relies on site-specific performance assessments and establishing a system that maintains those and revisits them in an iterative process.

And to that end we look forward to continuing to participate in this dialogue. I was very impressed by the other members here on this roundtable. I learned a lot and as a generator of DU waste forms and I do use the plural it's important to us that the ambiguities that exist right now do get addressed. I do think there are a diversity of perspectives on the matter, but I want to emphasize the point that my colleague Greg made and that's that there are waste forms that exist today that require disposal and I think that that's an important reality that we have to keep in mind as we move forward.

Again, I want to thank Chip for an excellent facilitation and Priya and Patty and the rest of your staff, Larry, for the help and the
information that they've prepared so that this could be a successful workshop. Thank you.

I don't think Bill has anything to say.

(Laughter.)

FACILITATOR CAMERON: Or you could have said, "Here's one person who doesn't need an invitation."

MR. DORNSIFE: Well, I guess I can say I appreciate your indulgence of my comments as part of the meeting and I, too, express my appreciations for NRC putting this together. I think it was extremely useful.

I do have a substantive comment and question though. Coming to this meeting, my biggest concern with this whole concept was period of performance and I'd like to know what the NRC staff has taken away from this discussion regarding period of performance and what are their thoughts of how they're going to deal with it based on that discussion.

FACILITATOR CAMERON: Do you want to handle that?

MR. CAMPER: Yes, that's a great question, a fair question, and then, Dave, please follow. I'll give you my perspective.
First of all, at the moment, we are open on this topic. I mean we have to go back and do a lot of review of what we've heard here. Obviously, we need to go have the meeting in Utah and get their perspectives out there. So, at the moment, we've not reached a conclusion.

From my vantage point, I made it a point yesterday to ask a specific question because I was looking for something we could take away. I mean we got into what I thought was an extremely interesting discussion about period of performance. There was a great deal of dialogue about the complexity of a period of performance, the variables to be considered, and so forth and so on.

It was at what I thought at an appropriate point in our discussion I asked two questions. One was should the period of performance be specified in the regulation as opposed to guidance. Generally, the impression that I came away from the panel was yes.

And the second question I cited our NUREG-1573 which talks about 10,000 years as a period of performance for our regulatory decision making with evaluation of consequences of long-lived isotopes in the environmental impact statement. Generally, the sense I got from the panel was that that was a
reasonable thing to do.

So from my vantage point again with the qualifier that we've not reached any conclusions nor will we until such time as we finish the workshops and communicate further to the Commission and so forth, my sense was they gave the staff something good to work with to think more diligently about. I was pleased.

And what I always look for are these kinds of things because there's always a great deal of intellectualism and dialogue that goes on. I'm always looking for a critical junction from a process standpoint. Does the staff have something that it can work with? Is there something that we can now go back further and put our hands around? I certainly felt that way at that point in the discussion.

Dave, would you add to that? Do you have any other views?

MR. ESH: No, I think I came into it being pretty open and I'm leaving being pretty open. I heard a lot of different ideas, a lot of different considerations, and it is an immense challenge and I think the best we can do is assess collective opinion of this group as well as the international community, consider our other regulatory precedence and programs and put all that together and see what we come up
with.

I think at a minimum what comes out of that it's going to be clear. You're going to understand it. Some of you may not agree with it. But I can't make everyone happy when there's different opinions. But that will at a minimum it's going to be clear. You'll understand it and it will be well thought out and it will reflect all the opinions that I heard in this workshop.

FACILITATOR CAMERON: Tom.

MR. MAGETTE: I, too, would like to thank the NRC for hosting the workshop. I think you did a good job. I think it was well planned, well managed. I applaud Chip for his incredible patience and diligence. Thank you very much. I appreciate the input from all the panelists. I think the exchanges were very helpful, too. All and all I think it was very productive.

I would like to just reiterate my view. I think the proposed process is the right way to go. I like what's happening. I think the rule should be kept as simple as possible and I think it really should do little besides state the requirement for the performance assessment and state the period of performance and I think also the notion of an intruder
dose that's in guidance belongs in the regulations.

So I think everything else that we've discussed is a matter for guidance and I'm glad to hear what David has to say about his expectation that it's going to be simple and straightforward. That's kind of what I expect because I don't really see that there's a need for anything else. But I would just like to emphasize that that would be what I would expect to see and would want to see. Thank you for the opportunity to be a part of this.

FACILITATOR CAMERON: And thank you, Tom. Larry is going to close us out, but I just wanted to thank all of you for your enthusiastic participation. It makes the meeting really fun and -- well, I don't know really fun but -- I'm sorry.

(Laughter.)

Makes the meeting worthwhile. So I thank you for that and thank all the NRC staff who did a lot of preparation for this meeting and you've met a lot of them through the presentations. But people like Leah and Brooke back there did a lot to help and Priya was just amazing to pull all this together for us.

(Applause.)

And we now have two mascots from the Montgomery County Police. We love you guys.
(Applause.)

Thank you for being here and thank you for being interested in what this was all about, too. That was great. That was fantastic.

And thank you to the attorneys. We should not leave them out of this. They've been with them all the way.

Larry.

MR. DORNSIFE: Can I have a quick question?

FACILITATOR CAMERON: Sure. Are we surprised?

MR. DORNSIFE: Some of us are going to be also involved in the Salt Lake meeting. Is the NRC planning on making any kind of comments at that meeting about this meeting and how do you feel about us relating discussions from this meeting to those folks?

MR. CAMPER: Yes, we would certainly provide some summary overview of what transpired here. Yes, we do need to -- I mean I don't know if the transcripts of the meeting will be available by then. I don't know.

FACILITATOR CAMERON: It will be.

MR. CAMPER: They will be. So the
transcripts will be out there. We'll probably do something between now and then to make people aware that those transcripts exist and how to get to them and that type of thing. We certainly will provide some feedback on what transpired here. Yes, we would do that.

FACILITATOR CAMERON: And I don't think that we're going to be able to constrain you from doing whatever you want to do.

MR. DORNSIFE: You're in Utah again.

FACILITATOR CAMERON: And Tom is never going to get the last word on this. But I don't want to make the people who are coming to this Salt Lake City workshop feel like this has all been discussed and this is stale. So whatever we can do to maintain that freshness and vitality out there is important.

Christine.

MS. GELLES: I certainly appreciate that there is a need to leave open the possibility of a good fruitful discussion in Utah and maybe some new ideas and perspectives. But to the extent that we reached very quick consensus on some of the key issues -- and I'm thinking of things like defining significant quantities, defining unique waste streams -- I would hate to see us particularly since some of
the same people will be at the table spend another
hour and a half having the same conversation over
again.

So to the extent that you could summarize
where there was a very strong sense of consensus but
present it in a way that does not constrain continued
discussion I would encourage you to think about
whether or not that's possible.

MR. CAMPER: Yes, that's a good thing.

FACILITATOR CAMERON: I think that's a
good suggestion. It can be done in a way that
wouldn't cut out discussion of it, but we may be able
to give more time to other parts of the agenda by
indicating that. So that's something that we have to
talk about, Priya.

Thanks, Christine.

Tom, did you --

MR. MAGETTE: I agree with Christine.

FACILITATOR CAMERON: Okay. That sounded
like the last word in the Dornsife-Magette -- I don't
know what to characterize it as. And thank all of you
in the audience.

Larry.

MR. CAMPER: All right. Thank you, Chip.

Let me continue the thanks that I've
heard. I want to thank the staff not only for the work that went into preparing for this workshop, but this is an issue that the staff has wrestled with, worked on, now for two years or so. I must tell you that looking back to all the many, many discussions that I had with the staff on this issue along the way the open dialogue that we had, the airing of strongly held views and in-depth discussions of the technical analysis throughout the process, the staff worked hard on this issue.

It was a pleasure frankly for me to be in these numerous meetings with them and recognize the talent that I was surrounded by as we dealt with this issue. It was at all times animated and likely and intellectual and frankly gratifying. So long before this meeting, the staff put a tremendous amount of work into this issue and I thank them for it.

In terms of the meeting itself, Priya and Dave and Karen and everyone on the staff that touched this issue, a tremendous amount of work goes into preparing for a workshop like this and I am very grateful to the staff for this effort all along the way and in preparing for this workshop.

The panelists, I mean, what can I say? How would I begin to compliment you for your input,
your varied views, your challenging commentary, your suggestions at how to procedure? All of it has just been an extremely valuable part of this process. Your expertise. Your experience. And, yes, the diversity of your views. You can't overstate that. A terribly important part of the process. And this rulemaking effort will be better for it because of this workshop.

I want to thank the audience. There were a number of interesting comments and questions raised by the audience. It's not easy to sit out there for a couple of days and you have thoughts and views on things, too, and you've been very, very patient and at times you offered commentaries. We appreciate that.

Chip, as always, you're masterful. You're just very good at what you do. I've heard a number of the panelists commend you on the way in which you've handled this forum and I would only echo that. It's really been a pleasure to work with you in that regard.

Along the way, I mean this question of an EA or EIS and what it should be. If one turns and looks at NUREG-1748 which is our guidance document on conducting environmental assessments, you'll find some criteria listed there. If any one of those criteria are tripped, it moves you toward environmental impact
statement. This is a very complex issue. I just
don't want to prejudge where we go. The process will
dictate where we go. But look at the criteria in
1748. It's pretty self-explanatory.

This is a challenging issue. There are
today approximately 700,000 metric tons of depleted
uranium that need to be disposed of. There will be
more depleted uranium coming down the pike in the
future presuming that these facilities are in fact
licensed. This is a challenging national issue. This
is a terribly important and complex topic that we're
wrestling with here.

This is the beginning of a regulatory
effort to address that. The Commission has directed
that we do this rulemaking as well as a risk informing
of the waste classification scheme.

And I think on that note I would probably
leave you with what I'll call one final basic message.
It goes like this. The NRC realizes the initial
assumption made during the development of the Part 61
waste classification table that all radionuclides not
listed on the tables by default or Class A could be
viewed as a faulty approach.

It was arguably erroneous to consider that
the waste streams considered in the Part 61 Draft
Environmental Impact Statement were sufficiently comprehensive such that a new waste stream, i.e., large quantities of depleted uranium, would not arise in the future and be subject to this default classification. In order to correct this problem, the NRC plans and is undertaking its normal stakeholder process and do a formal rulemaking addressing stakeholder concerns and evaluating technical and legislative factors associated with its safe disposal of large quantities of depleted uranium. The NRC believes this is the most prudent course to address the existing waste classification issues associated with depleted uranium and ensure that there is adequate protection to the public health and safety.

The Commission has directed the staff to do that in two parts, with limited rulemaking which has been the subject of this particular workshop and later look at the risk-informing waste classification in Part 61. So we've embarked on a long journey, but that's why we're doing it.

Let's subject this question of large quantities of depleted uranium to a process. I thank you for being a very important part of that.

FACILITATOR CAMERON: And when I talked to Larry about the closing I said, "Just don't be
provocative" and he said, "What does that mean?" And I said, "Well, don't say anything that causes someone to put their name tent up."

(Laughter.)

Okay. But Mike has something different. So you succeeded there.

MR. RYAN: Actually, it's a different item, Larry. You did a great job at closing.

Mr. Morrison who has transcribed many, many meetings that I've been at at the ACRS and the ACNW is getting married this weekend. So I think we owe him a round of applause for a great job and for his upcoming wedding.

(Applause.)

PARTICIPANT: Take the rest of the day off.

(Laughter.)

FACILITATOR CAMERON: And we want to see a transcript of the wedding.

MR. MAGETTE: And he's got a honeymoon in Salt Lake City.

(Laughter.)

FACILITATOR CAMERON: Off the record.

(Whereupon, at 5:14 p.m., the above-entitled matter was concluded.)