Official Transcript of Proceedings

NUCLEAR REGULATORY COMMISSION

Title: Workshop on Development of Regulations for Spent Nuclear Fuel Reprocessing Facilities

Docket Number: (n/a)

Location: Albuquerque, New Mexico

Date: Wednesday, October 20, 2010

Work Order No.: NRC-478 Pages 1-240

NEAL R. GROSS AND CO., INC.
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NUCLEAR REGULATORY COMMISSION

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WORKSHOP ON DEVELOPMENT OF REGULATIONS FOR

SPENT NUCLEAR FUEL REPROCESSING FACILITIES

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Wednesday, October 20, 2010

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Sheraton Albuquerque, Uptown Hotel

2600 Louisiana Blvd., NE

Albuquerque, New Mexico

9:00 a.m.

BEFORE: CHIP CAMERON, Facilitator

NRC STAFF:

MARISSA BAILEY

JOSE CUADRADO

TOM HILTZ

MIRIAM JUCKETT

MARSHALL KOHEN

TOM PHAM

PHIL REED

WENDY REED

OTHER ATTENDEES:

SVEN BADER

NATE BIXLER

BEATRICE BRAILSFORD

JIM BRESEE

ANNE CLARK

MIKE EHINGER

DON HANCOCK

JOHN HEATON

ROBERT HOGG

MIKE LEE

JIM LIEBERMAN

ROD McCULLUM

TOM PHAM

JAMES ROSS

REX STRONG

A G E N D A

P R O C E E D I N G S

MR. CAMERON: Welcome back to the second day of our workshop on the NRC's Reprocessing Rulemaking. And, as you heard yesterday -- I'm having trouble getting the attention of this group but --

But as we heard yesterday all of this information and discussion is going towards assisting the NRC with developing the technical basis for a potential rulemaking on reprocessing. And that's what needs to be done -- the technical basis -- before the staff can proceed.

Further with the rulemaking, and as Marissa pointed out to us, the ultimate decision about whether the rulemaking will go forward is going to be made by the Commission based on a staff paper that will come up -- a Commission paper decision expected in September 2011 I think you said -- `12.

MS. BAILEY: The draft technical basis is September 2011. Our goal is to have a final technical basis -- I think it's March 2012.

MR. CAMERON: Okay.

MS. BAILEY: To go to the Commission.

MR. CAMERON: Okay. So the Commission decision about whether to move forward with the rulemaking will be in the 2012 time frame. All right.

I wanted to give you a preview of the three remaining agenda items for today. But I also wanted to open the floor after I do that to any burning issues from yesterday that we need to discuss -- any questions, clarifications, observations -- Beatrice.

MS. BRAILSFORD: Could you just have folks do a real quick introduction? We've got like two or three new people here today.

MR. CAMERON: Good. Let's do that then. Let's start with Tom Hiltz. Tom?

MR. HILTZ: Good morning again. Tom Hiltz. I'm a branch chief in the NRC's Office of Nuclear Materials Safety and Safeguards. My branch has been responsible for about the last two years for work on the reprocessing frame work.

MR. ROSS: James Ross. I'm a vice president with GE Hitachi Nuclear in the nuclear licensing group. We have our own recycling technology that we'd like to commercialize and are very interested in the regulations that are going to be developed around that.

MR. HOGG: Robert Hogg with Babcock and Wilcox Licensing.

MS. CLARK: Anne Delane Clark. I'm the

coordinator [indiscernible] Radioactive Waste Consultation Task Force. I work for the State of New Mexico, and my main area of expertise is radioactive waste transportation.

MS. BRAILSFORD: My name is Beatrice Brailsford. I'm with the Snake River Alliance, Idaho's nuclear watchdog and advocate for clean energy since 1979.

MR. HANCOCK: Don Hancock, Southwest Research and Information Center here in Albuquerque. Again, welcome to Albuquerque for those of you who are just coming. We work on a wide variety of nuclear and non-nuclear issues primarily related to waste.

MR. BADER: Sven Bader, AREVA Federal Services, Charlotte. I'm the licensing manager.

MR. PHAM: I'm Tom Pham, the senior staff in the material control and accounting branch within the Division of Fuel Cycle Safety and Safeguards with NRC.

MR. CAMERON: And that's Nuclear Regulatory Commission.

MS. BAILEY: Marissa Bailey, deputy director in the Division of Fuel Cycle Safety and Safeguards in the Office of Nuclear Material Safety and Safeguards.

MR. STRONG: Rex Strong, Sellafield, Limited, United Kingdom.

MR. KOHEN: Morning. My name is Marshall Kohen. I'm a security specialist with the Office of Nuclear Security and Incident Response in the NRC.

MR. MCCULLUM: Rod McCullum, Nuclear Energy Institute. I lead the industry's Recycling Task Force. It's very interested in the work NRC is doing to develop this rule.

MR. STOUT: Dan Stout, Tennessee Valley Authority. I work in the nuclear generation development and construction organization.

MR. BRESEE: Jim Bresee, U.S. Department of Energy, Office of Nuclear Energy. My area of responsibility is advanced fuel cycle separations and waste farm.

MS. REED: Wendy Reed. I'm a radio chemist in the Division of Risk Analysis in the Office of Nuclear Regulatory Research at the NRC.

MR. REED: Phil Reed. I'm in the Division of Risk Analysis at NRC. I'm a member of the working group that's putting the technical basis document together.

MR. CAMERON: Thank you. Thank you all, and thank you, Beatrice, for that suggestion.

In terms of today's agenda we're going to start with the issue of security and safeguard issues related to reprocessing. We have Marshall Kohen with us who's going to tee that up for us and talk to us about some of the issues there. One obviously is non-proliferation. Then there's the material control and accounting aspects of that. And we may get into transportation issues there also.

We're going to do that this morning. And at one o'clock this afternoon when we reconvene we're going to go to the very important issue of waste management issues connected to reprocessing. And we will have Mike Lee from the FSME staff -- and I always have to use that acronym because I never can remember the name of the office -- but, anyway, FSME.

He'll be here to tee that up for us. And some of the issues there is if there's -- what do you do with the high-level waste that might result from reprocessing operations -- what about what's called waste incidental to reprocessing. And there's a whole issue of the classification level of the low-level waste from that. So we'll have a discussion on that.

And then we're going to proceed to environmental protection, our last issue. And I think we've -- or at least I've mentioned it many times that

there's two rulemakings -- important rulemakings in the wings that are going to be -- have very important implications for reprocessing.

And one is the EPA's rulemaking to revise 40 CFR 190. Too early to tell when -- what they're going to be doing with that.

There's also going to be potential revisions to the NRC's radiation protection regulations in 10 CFR Part 20 at some point. And I think there's a NRC staff paper due to the Commission next March -- around that time frame that will make recommendations for how the staff thinks the NRC should proceed with revising 10 CFR Part 20.

So rather than spend a lot of time on those issues -- although I do want to give people an opportunity to at least comment on those two rulemakings in terms of concerns and ask questions about them.

But I think the most profitable thing to do during that session might be to talk about what types of environmental review issues there are for Marissa and Tom, the NRC staff, in terms of this reprocessing rulemaking. In other words, is there going to be an environmental impact statement on a rulemaking and what are the scope of issues that

should be considered in that environmental impact statement.

So we'll focus on that. And I'm going to -- for that session I'm going to have Miriam Juckett, my colleague from the Southwest Research Center -- and pretty soon I may be working for Don -- I don't know. But any rate Miriam will facilitate that part of it for us. And then we're basically done.

Now, we have time for a reprise of yesterday. You worked really, really hard yesterday in terms of getting a lot of information out on this schematic of how this rulemaking framework might work. And at least from my perspective it was interesting to listen to the discussion of the performance requirements which some refer to as a surrogate for the safety goal. And that was that chart with highly unlikely, et cetera, et cetera.

The performance requirements plus the baseline design criteria, at least NEI parlance, formed the safety envelope for the licensing of the facility plus the integrated safety assessment, and, as we talked about yesterday, supplemented by PRA as appropriate. That produces the Items Relied On for Safety -- the IROFS.

And then there's the whole issue of

[indiscernible]. And you heard yesterday the approach of NEI in Seven X was to use the [indiscernible] for those IROFS where there could be high consequence events.

So there was a lot of information out on that. We had some good discussion about the performance-based/technology neutral versus prescriptive approaches to the rulemaking.

So there was a lot of hard work done yesterday. And I don't want to forget the larger policy observations that were brought up by Beatrice and Don about priority in the use of resources in terms of this project versus others, and from the host state perspective that there's a whole lot of issues in this state that the NRC has responsibilities for that need some attention paid to.

So that's sort of my summary of yesterday. But are there any things that -- any questions -- you know after a night of reflection on this are there some issues that you wish you would have brought up yesterday? Are there any clarifications that we need to talk about before we go to Marshall for the tee-up on safeguards and security? Anybody? Beatrice?

MS. BRAILSFORD: Could you just clarify from your flip chart if the integrated safety analysis

-- are you -- before you go to that step are you assuming a technology neutral approach? Because, you know, yesterday --

MR. CAMERON: That's a -- no, that's a great question because that's the piece that isn't on there -- is how does all this relate to the approach that's taken. And I'm going to ask for comments around the table on that issue because it seems that inherent in using the performance requirements BDC that has the hallmarks of a performance-based approach.

And I will turn to the experts on that. Marissa?

MS. BAILEY: I don't think that there's a presumption of a technology neutral approach with an integrated safety analysis.

MR. CAMERON: Okay. Anybody else -- comments on that? Beatrice, does that sort of give you your answer? Okay. All right. Yeah, sure, we can do that. And just introduce yourself to us for the record.

MS. PARROTT: Hi. I'm Jack Parrot. I'm with the NRC. I'm a member of the public. But since I will be a staff member working probably on this rulemaking what -- I didn't think I hear discussed

much yesterday was one step versus two step licensing. And since I wasn't at the Rockville meeting I would like to hear input on that if that is okay at this point.

MR. CAMERON: No, that -- thank you. Thank you, Jack. We spent a lot of time yesterday on performance-based versus prescriptive. There were some other issues in that first agenda item. And Jack is referring to one of them, which is the whole idea of do you follow the model that has been used in new reactors, for example, of having -- and other places one step licensing for this rather than two steps, the two steps being I believe -- and please correct me if I'm wrong -- that first of all the license applicant had [indiscernible] construction permit and then later has to come in for an operating license.

But let's have a little discussion on that. And Rod -- Rod, go ahead.

MR. MCCULLUM: Yeah. I think -- and we discussed this a little bit amongst ourselves yesterday before we came knowing it would come up -- and thanks, Jack, for bringing it up.

But from the perspective of industry I think we'd like to be able to keep our options open in this area. Obviously with new reactors the motivation

for one step licensing is to reduce business risk -- that before you make massive investments of billions of dollars literally that you have some certainty that the thing has been licensed.

Now, you had -- in Yucca Mountain you had a return to the two step process. That was something first of a kind. And in a first of a kind application, depending on again a lot of policy decisions -- and, again, we run into that where regulation and policy make -- maybe the moving forward with the recycling facility would be at such a pace anyway that a two step approach would make sense -- gain a little bit a certainty then gain a lot.

But, then again, you might have an applicant that has -- really what it goes down to is how much -- to what extent is this going to be entirely a free market enterprise and to what extent this is going to be part of a government policy. And we don't really know that yet. So I would say let's keep our options open.

MR. CAMERON: And I think that we might want to get some comments from the NRC staff and others -- is that Rod talked about the possible benefits of one step from the standpoint of the license applicant. But I would imagine that there

might be efficiency and effectiveness issues there with one step for the regulator also. Marissa?

MS. BAILEY: Well, I'm not sure I have an opinion. But I think I just wanted to point out that under Part 70 we do have both one step and two step licensing.

MR. CAMERON: Already.

MS. BAILEY: The enrichment facilities like LES and AREVA Eagle Rock are going through -- or have gone through the ones that process, whereas the [indiscernible] facility is going through a two step process. I think I see advantages and disadvantages with both, so I would like to, like Jack, get some input from the stakeholders.

MR. CAMERON: Okay. Well, let's go to Dan. And then I want to see if Beatrice, Don, or Anne have any opinions on this. Dan?

MR. STOUT: And just to amplify a little on what Rod said, there are a couple of other factors that weigh into a decision on making the investment -- the financial structure of the company making the investment -- you know, whether your cash flow is going to be heavily financed or not -- the maturity of the technology that you're using and which will go hand-in-hand with the size of the facility and the

investment that you're making.

In other words, if it's a first of a kind a logical approach might be to build a demonstration size facility. And you may choose to do that in a two step approach given that it's a less substantial investment and to recognize that given its first of a kind nature that the design will continue to mature through the process. So it could be a business decision to go in more of a two step like approach.

If you're hoping to deploy a very robust technology -- one that's been demonstrated commercially already -- and you're choosing to approach it in a business perspective of maximizing the amount of debt, minimizing the amount of equity type of approach, you would want to have a mature design, go in initially with that mature design, and seek to get the one step license to reduce the regulatory risk in commercialization.

MR. CAMERON: Okay. Thanks, Dan. And I -- as we're talking about this I realize that maybe there should be some information put on the table about what the implications are of one step licensing in terms of the NRC adjudicatory hearing process. Okay?

And I don't want to necessarily expound on

that myself as the facilitator here, but there are implications -- and not necessarily bad ones -- but there's a difference in terms of whether you're using one step or two step licensing.

But, Tom, I don't know if you want to address anything like that in your comments, but go ahead.

MR. HILTZ: Actually I just wanted to seek some additional understanding of the rationale for a one or two step. It seems to me that if you're issued both a construction and operating license that the only additional investment that you have is the investment -- and I'm not sure what the delta would be between the NRC staff reviewing just for a construction permit and reviewing for both a construction and operating license.

But I'm not clear -- sure I understand the rationale because it seems to me the biggest financial risk is in the construction. So it seems to me if you have a one step license and you proceed through construction and then you decide you're not going to operate, well, you have the option to not operate.

If you get a construction permit only -- or construction license only then you're authorized to construct. But then there seems like there's just

additional uncertainty from -- moving from the NRC from a construction phase to an operating phase. So I don't completely understand the logic.

I mean, I don't -- I personally don't see a problem with constructing a regulatory basis that allows for a one or two step. I just don't necessarily see the rationale.

MR. CAMERON: And I'm going to go to Dan and spend -- and -- we're looking at this from perspective -- we're talking right now about the perspective from the industry's point of view. We might want to turn to Phil or any of the others of you from the NRC to talk about -- well, what does a one step process -- what advantages does that give the regulator in terms of focusing resources -- whatever.

I think that you don't want to just -- if that's the case then it's fine. But the arguments for one step licensing might be broader than just the -- that the industry is putting forward. Not to minimize that, but we might as well get all the advantages out on the table. Let's go to Dan and then to Sven.

MR. STOUT: I think a lot of your points are dead on. In a one step licensing approach you need to have a mature design upon which that license is based. And that means from a construction

standpoint -- from a management standpoint your resources -- you're spending a lot of time and money on that design.

And then you hand it over to the NRC. And in the meantime what do you do with your staff? So it's a resource management challenge to support that one step licensing process. The time that the NRC takes to do its thorough review and issue permit is a long window to retain your resources and be ready for that construction phase.

So it's -- from a resource management perspective, especially on a first of a kind technology, it's a challenge. And I'm just suggesting that it would be beneficial to have the flexibility to do either a one step or two step to recognize that you could have unique and different recycling technologies being proposed where you would have a mature -- where it's fairly easy to come up with that mature design or another where it's not easy.

And the resources needed to generate that license application are different in those two cases. And the business implementation can be different depending upon the entity going forward with construction. So the need for a reduced risk from a financial perspective can vary depending upon the

entity deploying.

So, you know, when we talk about regulatory risk -- and, frankly, it's predominantly the legislative process -- the hearing process where the greatest uncertainty lies. The staff have been very good, especially recently, at laying out schedules and then delivering to them. And when that has become routine an investment community will reward that consistency.

MR. CAMERON: Thanks, Dan. And, Sven, and then we'll go to Phil and then check in with Beatrice and Don and Anne to see if they have anything that they might want to say on this.

MR. BADER: I'm to add [indiscernible] Triple F they didn't have much of a choice. There's a bit of a land mine in Part 70.

MR. CAMERON: A land mine?

MR. BADER: 70.23(b), which forced [indiscernible] M Triple F to basically demonstrate that its principle PSSCs -- not IROFS, but principle PSSCs, which is something from the construction authorization, are constructed appropriately before they can get an operating license.

So, you know, I guess my -- the point of this is [indiscernible]M Triple F is kind of forced

into a two step approach, even though I think it was very beneficial for them. The other point is that, you know, we need to kind of avoid these type of clauses in a revised regulation that, you know, might not be captured by somebody who's looking at it from a fuel fabrication facility standpoint as opposed to a recycling facility.

MR. CAMERON: Great. Thanks, Sven. That raises another issue -- long-term parking lot issue -- perhaps is, are there going to be implications if this rulemaking goes forward -- whatever approach is taken are there implications from the approach taken in this rulemaking for other -- for existing parts of the NRC regulations that might need to be changed. That's a long-term thing.

But -- hey, Phil, what about -- what do you have to say on this?

MR. REED: The reason we are addressing the one step licensing process is because in the Commission paper that we sent up, the SRM that came back said that we should look at the one step licensing process for Part 52 and apply it to a reprocessing plant.

I think there are three areas that we're really looking for input from with this process. I

think the first one is a siting requirement. As you know, the one step licensing process does allow the siting to be done either inside the one step or outside. And it does give you flexibility to do this siting process outside because it does take a lot of time and effort, resources, and all the activities that go along with the states.

So one of the things that is useful is which way do we go? Do we put it outside or do we put it inside and let the one step licensing process cover the siting aspects?

MR. CAMERON: And let me just stop you there so that we -- I -- so that everybody understands what you're talking about -- inside and outside. And are you talking about the use of -- as in Part 52 for reactors of an early site permit?

MR. REED: Very similar, yes. That's exactly right.

MR. CAMERON: Okay. And that -- can we -- we should just explain, early site permit is an option open to an applicant for a facility to basically get the environmental approval for the site -- bank the site basically for future use. And I'm being very in artful about that. But does anybody -- do you want to explain it a little bit more so we make sure that

people outside the direct frame know what that is?

MR. REED: Well, I think you explained it very well. It's a very time consuming, can be expensive process. If you do get the site permit -- early site permit then you can come in for a COL -- a combined operating license -- and everything seems to work well.

Now, Part 52 does give you the other option of if you do come in for a COL you can come in just with a blank sheet and then the siting aspect will be treated within that entire process.

MR. CAMERON: So that's one issue that the working group is looking at. And you said there were three that you wanted to talk about.

MR. REED: The other big issue is this concept called ITAAC, which is the Inspection Testing and Acceptance Criteria. And it's not really clear at this point exactly what is going to be needed for this.

And I know there's a considerable database built up for reactors, but when it comes to designing and putting together a regulation for reprocessing it's a little bit more difficult to do. And so we're looking for some input from the public as to how we should approach this.

MR. CAMERON: Okay. And that model is, at least in -- with new reactors the issue of ITAAC and inspection tests -- it's like [indiscernible] FME for me. I mean, does anybody want to --

MR. REED: Inspections, Test Analysis, and Acceptance Criteria.

MR. CAMERON: Okay. The idea is that with one step the applicant comes in for combined operating license. If they get their license, then the last step in that process is to make sure that they have met all of the ITAAC. They have to demonstrate that there can be a second adjudicatory hearing on whether the ITAAC were met. The first adjudicatory hearing is on whether the license should be issued in the first place. And, Rod, clean up this if you need to.

MR. MCCULLUM: Yeah. Or -- yeah, I'll try to clean it up. I think the ESP is an excellent idea. I also work -- I lead industry's early site permit task force. And there is growing interest -- originally in the one step process there was a desire to want to do everything all at once in the combined operating license. So we started to move away from ESPs.

We're starting to move back to them. We're seeing that for some applicants there is utility

in addressing siting issues before you've made the investment that you would in a license application. There's a lot of interactions you can do with your state and local stakeholders through the early site permit process -- do that before you make too many more significant decisions. Make sure you can build acceptance or know you didn't build acceptance before you put that money at risk.

ITAAC is a big issue. We're just testing those waters in Part 52 now and we'll let you know how that goes. But something -- when you have a one step process, you know, that very last part of it does have to be addressed so that it doesn't become the equivalent of a two step process.

And I want to get back to Tom's question and also explain the flip side of the coin Dan talked about. Dan talked about the motivation where in this case you might want to do a two step process.

I know -- the reason we moved to one step licensing -- the reason Part 52 was written -- I worked very early in my career in a nuclear plant that had its construction permit prior to Three Mile Island and then was in the post-Three Mile Island seeking its operating license.

That plant was originally scheduled to be

a $500 million. We brought it online at $6.2 billion. The amount of regulatory change that occurred around Three Mile Island -- and I wouldn't blame it all on regulatory change -- there were things internal to the project too -- was massive and unprecedented.

And, you know, things had been purchased, things had been installed, things had -- valves had to be cut out, piping had to be rerouted, designed had to be redone, systems we didn't envision being part of the plant had to be installed.

No responsible executive would ever want to go down that road again. Now, that plant has a happy ending because it's been providing electricity now safely for 20 years and it's a good asset to the place in which it's located.

But -- so there is a tremendous amount of business risk to getting a construction permit and then spending money actually buying pressure vessels, installing them, pouring concrete, doing all those things, and then finding out in order to get your operating license you have to do something different. That's the motivation for one step licensing.

That being said, when you have a developing technology as Dan alluded to where you are a first of a kind, you know, you have to manage this

differently obviously. You may want to take that risk because it would actually be a greater risk to try to go for it all at once when you need that first step to kind of tell you where to go.

So, yeah, we really need the option, and it really depends on what technologies are deployed under what policy framework.

MR. CAMERON: Okay. Thank you. Let me see if Beatrice or Don or Anne has any reaction to this discussion. Don, do you want to --

MR. HANCOCK: Well, I have several reactions. I was glad that Phil brought up the siting issue because I was going to bring it up. I think that's a very major issue.

In the country we have four reprocessing sites and we have two other sites that were somewhere in the reprocessing process in terms of Morris and Barnwell. So I think there will be a major issue from a public standpoint in terms of whether a reprocessing site is at -- you know, a existing past reprocessing site, if I can use that terminology, if it's at a already licensed site for something else other than reprocessing, or if it's at a site that hasn't ever gone through a licensing process.

So I would agree with the idea that the

siting issue is going to be a major one and would certainly encourage both the industry and the NRC to think very carefully about how to handle that issue.

As everybody I think is aware, before I say it once again, a reprocessing plant in the United States is going to be very controversial. And so the siting is going to be one of the things that's going to be seriously related to that. So, you know, that's going to have to be done.

My organization has not worked on reactor licensing -- you know, one step or two steps. So I'm not speaking out of our organization's personal experience. I do know from talking with organizations in other parts of the country that have dealt with it that there has been significant concerns about the one step licensing process for reactors. And, again, I would hope that's very seriously considered in terms of what a reprocessing rule would look like.

I actually am pleased to hear that the industry folks are considering -- you know, doesn't necessarily have to be one -- might be reasons to do two -- I mean, that's good. I'm glad to hear that. I -- again, I think a reprocessing plant is going to be very controversial wherever you put it, et cetera.

I think a one step process for a

reprocessing plant is likely to be an additional part of the controversy if that's the way -- if a one step is going to be, you know, the way it's going to work. So I think that needs to be thought through pretty carefully as well.

I -- as has been said several times -- and this issue I know was discussed at the September workshop and there were concerns about one step expressed there too -- so I'm not the first one to talk about this.

But I think from a public standpoint it's a little counter-intuitive to say that a reprocessing plant would be a mature design similar to reactor licenses that can do one step because we've all agreed that, yeah, if you want to talk about mature reprocessing technology in the United States those all have pretty bad outcomes.

So if we're talking about the mature technology being pure access that's been done in the United States up to now that's -- you know, that is a problem. If we're, as I think I and other people assume and what at least some of the industry have said, is there will -- that whatever reprocessing technology comes forward under technology neutral or non-technology neutral approaches there will be some

new aspects for the United States if it's -- even if it's using reprocessing technology from some other international -- where there's some international experience with.

So from a U.S. standpoint to talk about this first license application, if there ever is one for a reprocessing plant being mature technology and fitting into a one step process, seems pretty -- a pretty difficult concept to me.

MR. CAMERON: Okay. Thank you. Thank you, Don. And let's go to Beatrice and Anne. And then I want to check in with Sven. I thought you might -- you were sort of picking your [indiscernible].

(Unintelligible voices.)

MR. CAMERON: Okay. We'll see about that. But let's go to Beatrice and Anne and then to Tom and perhaps the reluctant Sven. Beatrice.

MS. BRAILSFORD: Thank you. And I think you're both right, and Don has said most of what I was -- my buttons.

I do think that the -- you know, the whole early site permit thing also raises another question, which is how robust is the relationship between the NRC licensing process and the National Environmental

Policy Act. And, you know, site selection is a key step of NEPA EISs. And if it has already been made it makes a mockery of, you know, a fundamental law in the United States I think.

Do you want to counter me or do you want me to just --

MR. CAMERON: No, I just wanted to explain that there is a full environmental impact statement done on the early site permit. Okay?

MS. BRAILSFORD: Thank you.

MR. CAMERON: You're welcome.

MS. BRAILSFORD: So you did want to counter me -- and correct me. And I thank you for that. I guess my only other things to add are the whole question of whether you have a two step process and then something like Three Mile Island intervenes between step one and step two.

God willing and good regulation something like Three Mile Island will not happen. If it did happen again construction on similar nuclear facilities would be compromised no matter if you had all your papers in a row or not. So I'm just saying that as a real world response.

I also think this whole question of, well, if we had mature technologies -- and I couldn't agree

more with Don that I don't think that there is a mature reprocessing technology in the world that anyone would want to be -- to replicate here in the United States as our first step back into the reprocessing world.

So I don't think that there is a mature technology, you know, kind of off-the-shelf kind of stuff. But to the extent that aqueous processing is mature and pyro isn't I think then again that does go back to what is the effect of this technology neutral approach. If we have two step licensing -- I mean, you know, where's the -- how many exemptions are we going to have in this neutral process.

And then I guess I would just like to ask Rod -- you made a statement -- no, it wasn't Rod -- it was [indiscernible] -- whose name is -- don't help me -- Dan. Free market versus government policy -- oh, no, it was Rod -- who was it? Anyway, I would like to -- whoever contrasted we don't know if this is going to be a free market enterprise or a government policy I'd like some further information about that. Thank you.

MR. CAMERON: Can we just follow that --

MS. BRAILSFORD: It was Rod.

MR. CAMERON: Can we just follow that --

finish that thread and then we'll go to Anne and Tom and Sven. Rod, do you want to respond to Beatrice?

MR. MCCULLUM: Yeah. I'll given an example and I'll -- this will draw Sven into it. But let's say, for example, if Sven was going to build a twin of La Hague here in the United States, which that -- at least the French think it's a mature technology -- and had private investment all lined up to support that he would probably want a one step licensing process. He would not want to take the risk of having regulatory positions change for whatever reason in between the two steps.

However, if the federal government, as Dan has suggested -- I think it why you were confused between the two of us because we were both talking about it -- was going to take a more incremental approach and first license a prototype of a facility that would allow it to make some technology choices going -- with some technology choices still open and then finalize the design after having learned what they learn from the construction permit process.

And if that was a public/private partnership, which is what I meant -- that the federal government was investing in that technology development and seeking private partners to actually

build the facilities -- now, again, none of these decisions have been made, and it could run anywhere in the spectrum.

One thing -- and I don't want to lose this thought that has come up that works in both cases though is an early site permit type process. And particularly having heard the concerns that Phil and Beatrice expressed here is that, that is an opportunity in a really technology neutral way.

I know we have -- in the reactor world we have early site permits that envelope a range of reactors. The applicant does not even know what reactor they're going to build yet, but they put together a plant parameter envelope, addressing the environmental impact issues, interact with the stakeholders, then determine whether or not they could build a reactor on that site -- is that site suitable for 1,600 megawatts or whatever, you know, of a reactor.

So either -- in either process I think all interests might be served by that. And I think that's something I hope we would capture out of this workshop is there's significant value in that.

MR. CAMERON: Okay. Thank you, Rod. And just for further clarification on that, when you talk

about the public/private partnership are you referring to something similar to the Department of Energy loan guarantees or things like that?

MR. MCCULLUM: It could be loan guarantees. There were all sorts of things envisioned in [indiscernible]. I don't want to be specific because neither the private sector nor the federal government has proposed anything specific yet. However, it is possible that something could be put together where there would be some federal investment as well as some private investment.

But, again, if Sven was going to line up private investors and build La Hague II somewhere here that would be a different story.

MR. CAMERON: Okay. Good. Thank you. Let me check in with Anne. Anne, do you have any thoughts on this one step, two step process?

MS. CLARK: I actually don't have any additional concerns to what has already been expressed. I think Don and Beatrice both expressed the same things that I was thinking.

MR. CAMERON: Okay.

MS. CLARK: I don't have anything else to add.

MR. CAMERON: That's fine. Thank you.

Let's go to Tom and then Sven. And I think that we're probably ready to go to our first agenda item after this. Go ahead.

MR. HILTZ: Thanks, Chip. I just wanted to maybe add to the discussion a little bit and see if there's any insights. Phil mentioned the early site permit. He mentioned ITAAC. And one of the differences between a Part 52 process in general and a Part 70 one step licensing process is the concept of a certified design.

Now, in Part 52 there are likely multiple candidates to be used for a certified design. But there are also advantages I think in the hearing process that resolves issues on the design early on.

So I'm wondering if there's any thoughts about -- as we consider one step, two step what parts of the Part 52 model we want to move forward with, you know, in addition to some of the concerns about issues with ESP. Is there any prevailing thoughts about a certified design?

MR. CAMERON: Okay. And let's go to Sven and -- who has a point to make. And, Sven, if you want to also address Tom's -- if you have any thoughts on Tom's point please do that. And then we'll go to Rod.

MR. BADER: Mine's more a sales pitch. And, one, I would not personally finance a reprocessing facility. I think when Rod pointed at me I think he pointed at AREVA.

But the other point about mature design -- you know, we are in France on basically the fourth design of a reprocessing facility [indiscernible]. That is built on U.S. designs so it's continuous improvement from U.S. design.

In addition, you know, during the [indiscernible] studies we did other alternative process investigations basically trying to minimize waste and look at proliferation resistance and so forth. And that kind of -- you know, we introduced the [indiscernible] process, and that's actually something that we are building now in Japan -- or has been built in Japan.

And in the United States there's actually an aqueous polishing process in Triple F, which is now licensed by the NRC -- well, there's a draft SER out there that's not -- doesn't have an operating license yet but -- so there is maturity in the technology.

And to address Tom's question about, you know, do I need to have a certified design facility up front, I mean, to me that's still two steps. And I

think, you know, people [indiscernible] -- Part 52 sounds like it's a one step process but it's one step [indiscernible] process. It's still a two step overall process because you've got to get this certified design up front.

And, you know, from AREVA's standpoint I would like to say that, you know, we do have a mature design. We would like to potentially build a facility in the United States, but we really need some regulatory certainty. You know, without regulations we can't make a business determination, you know, and -- you know, it's hard to work.

You know, I've heard discussion about partnering with UE for these prototype facilities -- or start-up facilities. This wouldn't be a prototype. I mean, this is an advanced technology, you know, what we're talking about. And really what we're talking about is probably the size of the facility and how financially -- can you afford it or not ultimately.

And so, you know, what we're looking for is a regulatory certainty, and that allows us to build the business models.

MR. CAMERON: Okay. And that goes back to some of the discussion from yesterday about why are

regulations needed in an earlier time frame. Sven?

MR. BADER: And I think Phil had a third point that we haven't heard yet.

MR. CAMERON: Yeah. Phil, what was that third point?

MR. REED: I think Tom just mentioned the third point that we were concerned about. Because it was brought up in the Rockville discussions and it seemed like that perhaps -- well, it was either one or four. But Tom expressed the concern --

MR. CAMERON: The design certifications.

MR. REED: Yeah.

MR. CAMERON: Okay. Thanks, Phil. And, Rod, on design certification, then we'll go to Marissa.

MR. REED: Yeah. And just to clarify, I was referring to AREVA and not Sven personally. And the record should show that even then it was a very big capital hypothetical in front of that to illustrate the example.

But the answer I think to Tom's question is quite simple. The utility of the design certification process was because we intended to build quite a few reactors and it was all about standardization and the idea that the different

vendors could get their designs certified and then go market those certified designs to different customers.

I think this is a walk before you run or maybe you crawl before you run issue here. I don't think we're at the point in the regulatory framework we're looking at developing now where standardization is really going to be an issue. There's simply not going to be dozens of reprocessing plants.

So you would be requiring a lot of effort and simply adding another step to the licensing process if -- you know, you're going to be reviewing the design anyway in the initial license application whether it's one step or two step because it's first of a kind. So as industry we would not see any utility in a design certification.

MR. CAMERON: So the rationale that's there for the design certification concept for reactors in terms of standardization many designs is really not there in the reprocessing.

MR. REED: That's correct.

MR. CAMERON: Okay. Thank you. Marissa?

MS. BAILEY: Just a clarification to what Sven said so that there's no misunderstanding. NRC has not issued a construction authorization or a draft safety evaluation for reprocessing facility. What

we've issued is a construction authorization and a draft safety evaluation for the MOX fuel fabrication facility.

MR. CAMERON: That's just sort of enthusiastic wishful thinking on AREVA's part I guess -- not Sven's. All right. Thank you. Thank you for that.

Well, this is a good discussion. Thank you, Jack, for bringing it up. And thank you, Phil, for putting on the table the options that are facing the -- the issues that are facing the working group. And, Marshall, are you ready to tee up the safeguard for us? Okay. Great.

MR. KOHEN: Well, good morning again. My name again is Marshall Kohen. I'm a security specialist in the office of Nuclear Security and Incident Response at the NRC. Our office is responsible for developing the security policy for the Department, and my branch specifically works in the area of the fuel cycle facilities.

I want to -- and I'm also the office's representative on the working group for the development of the reprocessing rulemaking.

I want to point out that my colleague Tom Pham from NMSS is here as well. Although we security

and MC&A complimentary disciplines security happens to be -- the security policy happens to be in one office and MC&A policy happens to be in a different office. So while we work together Tom can answer specific questions when it comes to material control and accounting aspects.

What I'd like to do today is talk a little bit about our involvement in this process really boils down to the materials that are going to be at the front end, the middle, and the back end of a reprocessing -- a potential reprocessing facility -- and the protection of those materials.

So what I want to do primarily today is talk a little bit about how we view the special nuclear material, how the NRC categorizes those materials, and I'll talk a little bit about how that's potentially going to change.

And I'll apologize to those of you who already know this or were at my talk six weeks ago or both. We have some folks who weren't and so hopefully this will be instructive for everybody.

Most of you probably know that the regulations for safeguards and security are in two parts. One is 10 CFR 73, which is the physical protection of plants and materials, and then the

material control and accounting aspects are covered in 10 CFR 74.

So what is special nuclear material -- or SNM as we refer to it? SNM comprises plutonium, uranium 235 and uranium 233 by definition. We divide SNM into three categories, Categories 1, 2, and 3, for security and MC&A purposes. And this is based on the potential for the use of this material directly for the production of a fissile explosive device or indirectly for the production of those materials that could be used.

And I want to really stress this. Every time I talk about material categorization and the table that's in the CFR I always want to make the point that we're talking about one specific threat to that material -- and that is the threat of theft of that material from the facility or even from transportation for use in an improvised nuclear device.

We're not talking about sabotage here, so it's a different threat that we definitely take care of within the regulations and within the guidance. But specifically we're talking about categorizing material. We're talking about that specific threat.

These categories in the table are based

solely on the quantity of material that's involved and for U-235 the enrichment level.

So here is the table that NRC uses and that is enshrined in the regulations. I'll give you a second to look at it. A couple of things I guess that I would point out that are not on the slide -- the definitions that are used in the regulations are strategic special nuclear material, which refers to Category 1 material. SNM of moderate strategic significance is the other name for Category 2 material. And SNM of low strategic significance is the equivalent of Category 3. And so that's the nomenclature that you see in the regulations as opposed to Category 1, 2, and 3 for the most part.

So currently the material categorization for the materials that would be used in a reprocessing recycling facility campaign take account of all these. Currently the nuclear power reactor fuels are Category 3 materials. They have the enrichment -- and even if they are of a certain quantity the enrichment level of that material renders them Category 3.

Now, obviously, we protect nuclear power plants not at a Category 3 level. We protect them at a -- with stronger physical protection, and that's based on the consequences of sabotage of that facility

and the release of the material that would -- that result.

Reprocessing and recycling would obviously introduce plutonium and other transuranics. The fuels -- any fuel containing greater than 2 kgs of plutonium currently would be termed Category 1 regardless of the isotopic or the form of the presence of any other materials which would be of a different -- what we would call an attractive level.

Any other TRUs -- or specifically other TRUs, neptunium and americium have SNM-like characteristics. This has been shown in numerous studies. The current regulations, just to point this out, do not consider -- the current physical protection regulations do not consider the other transuranics -- that is, neptunium and americium.

Plutonium is -- as you might guess from that second bullet, is plutonium is categorized without consideration of form or isotopic composition. And I'll go back to the category table to show you. If you have greater than 2 kgs of plutonium currently it is a Category 1 quantity and it requires Category 1 level of protection and the appropriate measures.

As you may know, we have received an SRM -- a Staff Requirements Memorandum -- from the

Commission to proceed with revising the categorization structure. We've been working on this for a while but we -- and we've put up a paper to the Commission and received a response, an SRM that has now been made publicly available.

And part of that SRM is to include material attractiveness as part of the upcoming physical security fuel cycle rulemaking. This rulemaking, which is a complimentary rulemaking -- this rulemaking will be the most comprehensive review of Part 73 in somewhere between 25 and 30 years. The -- obviously Part 73 has been revised numerous times over the years, but it's been piecemeal.

This is the first time in quite a long time that we're taking a comprehensive look at Part 73 to ensure that the physical protection measures are appropriate. And the word that we have been using and used when we brief the Commission is to right-size the physical protection measures so they're appropriate to the type of material to the attractiveness of the material for use in a nuclear device, and so that everything is in a graded -- more of a graded fashion.

It's already in a graded fashion with respect to Categories 1, 2, and 3. But what we're talking about doing is including, similar to what DOE

already has, is another column in that table which would be an attractiveness column -- nominally A, B, C, and D. So it would stratify a little bit more the categorization table to make a little bit more appropriate consideration of the materials and the other aspect of the materials that we needed to consider.

The rulemaking will include not only this re-look at categorization, but it will also take a look at putting into the regulations a myriad of orders that have been placed on certain facilities since 2001. There was a need immediately after the events of September 11 to put in place for specific facilities with certain types of material -- immediate orders -- and immediate compensatory measures to upgrade physical protection. We're now going to take a look at how to infuse those orders permanently to the regulations for those types of materials.

What I'd like to do I think for the rest of the couple of slides that I have is address a few aspects of the SRM that have applicability to a potential reprocessing and recycling facility.

What I've done is sort of excerpted a little bit from the SRM. And, as I've said, the SRM is publicly available so you're all certainly welcome

to go look at it online.

The first one is that the Commission is requiring us -- and we were going to do this anyway, but it's now enshrined -- to engage a broad range of stakeholders as we develop the rulemaking package, including the international community.

The interesting aspect of this obviously is that DOE has a categorization structure that considers material attractiveness -- NRC currently does not. We have the identical table that's used in IAEA Information Circular 225, which is recognized internationally as the standard for physical protection, which has actually just been revised -- a revision five is about to be published, or at least finalized.

And so what we're trying to do is move toward, as I said, a little bit more of a graded approach. So what we need to do -- and we've known this all along -- is to have discussions with our international partners to make sure that we are still abiding by the guidelines and in concert with the guidelines that are in CIRC 225, as well as just letting our international partners know where we're going with this process.

Public meetings are in the offing for our

particular rulemaking. We consider this part of that structure that we're asking for comments from the public. We've had initial discussions with a couple of NRC licensees, with the other government agencies -- Department of Energy, Department of State -- as well as some international colleagues.

In fact, my branch chief was over in Vienna last week in other bilateral discussions with the IAEA. But included in that was a topic to discuss with the IAEA a possible meeting or seminar on an international basis to discuss what we're doing in terms of material attractiveness. We intend to have further technical discussions. We're going to need to work with our domestic international partners on this as well.

Second aspect of the SRM that I want to touch on is the fact that the Commission did not advocate having this particular rulemaking focusing on categorization of material associated with reprocessing. What does that mean? We're still working on that.

What they've said is, instead, as a separate effort, not on the same time frame -- we're not in the same time frame as the rulemaking that we're currently embarking on -- three aspects should

be covered in a separate effort. One is the categorization approach for reprocessing. And that we understand to be the materials that are associated with reprocessing.

The due date for -- at least what we consider our due date for work on that would be in concert I think with the due date that we're -- the time lines that we're talking about for the reprocessing rulemaking itself.

The second aspect that the Commission mentioned was to put off the work on transport of mixed oxide fuel. We are currently also working on rulemaking for transportation security. Transportation security is a part of Part 73 as well as the fixed site security. We are working on that as a parallel rulemaking and it will be closely coordinated with the rulemaking that we're doing on fixed site security.

The third aspect that the Commission noted is that they wanted us to consider in this separate effort what they called applications that use large quantities of americium and neptunium. And obviously they're referring to a reprocessing/recycling thing.

Currently there are small quantities of americium and neptunium that are held by NRC

licensees. But they're relatively small and we envision that any large quantities would be produced by a reprocessing campaign. So, again, this type of analysis we assume will be provided concurrent and consistent with the reprocessing rulemaking.

Final aspect of the SRM was that the Commission pointed to specifically how we determine what the threshold values will be in this new categorization scheme. I showed you the categorization table and it had numerical values that were the thresholds for quantities to help you determine what the categories were. The Commission is interested in how we're going to do that analysis.

The analysis to provide those quantities if -- and how they're going to be revised is going to be [indiscernible] by both the current regulations or current understanding of how those thresholds were developed in the first place as well as, as I talked about the -- we have to be sensitive to our commitments internationally in terms of the numbers in CIRC 225.

We -- part of the public process here is to engage the public and to get feedback from our international and domestic partners in how to develop -- best develop those numbers. And we have a couple

of ongoing studies that are going to provide us we think some solid analysis and information to help us make those decisions.

In terms of MC&A -- and I'll mention this and if you have specific questions again I'm sure Tom is much more capable of answering them -- Part 74 -- 10 CFR Part 74.51 currently excludes reprocessing facilities from the Category 1 MC&A requirements. And so what this sets up is a situation in which we have -- potentially have requirements that are not consistent between facilities with similar categories of material.

As I said at the last meeting my understanding that there's a plan to remove this exception in Part 74 in the upcoming MC&A rulemaking. And Tom can correct me if I'm wrong on that.

So, with that, I want to put up the discussion questions that we've had at the end of each of these tee-ups and we can move from there.

MR. CAMERON: Thank you. Thank you very much, Marshall. That was great comprehensive overview. Before we go to discussion -- these discussions questions is there any questions of clarification for Marshall or Tom at this point about the presentation? Beatrice?

MS. BRAILSFORD: Marshall, on your slide 7, when you said the MOX transport consideration is being put off, do you mean -- could you just explain that? Because you were bullet 1 -- maybe I didn't understand the slide.

MR. KOHEN: Sure. Maybe I wasn't clear enough about that. The initial plan was to do rulemaking and revise the requirements for fixed site fuel cycle facilities -- Category 1, 2, and 3 facilities.

What we've realized then -- and I'm sure if everybody knows, but we just completed a rulemaking on Part 73.37 which has to do with transport of spent fuel which is currently considered Category 2. But we treat spent fuel a little bit differently from physical protection standpoint in terms of transportation.

What we're planning to do is to consider the transport of MOX in the -- sort of this comprehensive range of materials in terms of how it's treated physical protection wise for transport. How it's actually going to be couched in terms of rulemaking I'm not sure we've fully decided because, as you mention, the Commission said don't talk about transportation of MOX in this rulemaking.

Obviously if we're going to do a comprehensive review of all the materials that are being transported MOX is something that we're going to have to think about. Again, how it's going to be characterized I can't say at this time. But it's something that we're going to have to consider in the spectrum of materials.

MR. CAMERON: Okay. Dan, do you want to -- are we still on the clarifying questions or do you want to -- are you going to jump into that first bullet question? (Pause.) Okay. Go ahead.

MR. STOUT: Just -- TVA is in discussions with the Department of Energy on the use of MOX from the Savannah River site. You know, we are in the process of conducting the environmental reviews of that whole process and plan to make a decision in 2012 on whether or not to use MOX as part of our fuel in our reactors. And we encourage the NRC to be integral in that whole process. You know, the first shipment is 2017-ish or something like that. We're in this formulation phase of the requirements and we need to understand the level of requirements and the amount of security that's going to be involved in this operation as it comes onto our site and we interact with the handoff of receiving the MOX fuel.

And we encourage the NRC to continue to collaborate with the Department of Energy and take a graded approach to the appropriate amount of safeguards and the security required with that kind of fuel.

MR. CAMERON: Okay. Thanks, Dan. There's -- this first bullet up there is a pretty global question. Are there any aspects that need to be revised or augmented to ensure secure use and safe handling? Anybody have some thoughts on that? Robert?

MR. HOGG: One of the things that has been talked extensively about in the development of both the NEI paper and this topic generally is the application of safeguards by design which currently -- most of the operating facilities implement safeguards by something other than initial design certainly since they've already all been designed and most of the activities of both security and measurement control and accountability are implemented after the fact.

Certainly one of the things that we would like to be sure is -- that if there's a safeguards by design type criteria that it gets clearly stated and the expectations for it be clear such that they can be worked into the initial design of the facility.

MR. CAMERON: Okay. Thank you. Marshall, let me get your reaction and Tom's, if that's appropriate, to the idea of safeguards by design. And is that something that -- is there a useful analogy in the NRC regulatory pantheon to safeguards by design? Tom?

MR. PHAM: Our current regulation now are not [indiscernible] by safeguards by design. We understand that safeguards by design approach is a new way the IAEA, the International Atomic Energy Agency, want to do. And also within the U.S. different organizations tried to endorse or tried to promote that kind of safeguards by design.

My -- our opinion is right now safeguards by design is a good way to think about -- consider that building design part of the facility, especially a new facility. One of the difficulties everybody run into that include the IAEA we do not have clear guidance, we do not have clear guideline how to do it.

But it just different countries use that but on an experimental basis. And we -- but the bottom line is our regulation now is not written by -- we don't have a requirement safeguards by design in our safeguards regulation.

MR. CAMERON: But there are examples from

other countries perhaps or something that the International Atomic Energy Agency has developed that could be used.

MR. PHAM: To clarify on that, the IAEA -- it's just a guidance -- it's not a requirement. And I do not think that any country has any specific requirement -- safeguards by design requirement in their regulations.

MR. CAMERON: Okay. Thanks, Tom. And then -- and Rex may have some experience with this. We're going to go to him, but this safeguards by design is definitely something that should be looked at -- considered for this particular rulemaking. Rex?

MR. STRONG: We have two processing plants at our site. And they have been fully within international safeguards since the late 1990s. So in our case all the requirements of the International Atomic Energy Agency flow through, not by our regulatory route as you would recognize it because international safeguards obligations are dealt with by one of our government departments and then down to us.

But in addition to that, because U.K. is a member of the European Union we are subject to the safeguards control which come through the European Commission.

In the specific case of the design of the thermal oxide reprocessing plant safeguards considerations were fundamental to the design of that plant as the design evolved. So there are specific features designed into that plant which are there because the safeguards authorities needed them to be there in order to grant the equivalent of their licenses.

So in a sense there is actually international experience of this kind of thing which comes into play when organizations are engaging in reprocessing for a commercial as distinct from military purposes. So if it's a commercial all these things apply.

MR. CAMERON: Thank you. Thank you, Rex. That's very helpful. I'm going to go to Tom first -- and question for both Tom and Marshall. Is this concept of safeguards by design -- is that pretty much front and center on the plate in terms of what to consider going within this rulemaking or a companion rulemaking? Tom?

MR. HILTZ: I'll share my understanding and invite Tom to help clarify that. But just to amplify I think our regulatory structure for safeguards by design we have 10(c) of our Part 75

which requires that if you're designated for safeguards and selected by the IAEA for safeguards that you comply with -- and you subject yourself to safeguards.

I think we do not regulate safe by design. It is in the applicant's best interest to look at what safeguards requirements may be applied to that facility and consider those in the design. But we do not regulate safe by design. We just require that if a facility selected currently that they subject themselves to IAEA safeguards.

To support some of the interactions, because it is an important issue for some of our applicants, we do facilitate discussions with Department of Energy who has the lead for safeguards by design in some of the national labs I think are at the forefront of considering new safeguards techniques.

But we don't regulate or require a safeguards by design, at least currently, and it is not currently in the scope of the reprocessing rulemaking that we are considering.

I guess I'll just conclude by saying there are a lot of lessons learned out there associated with safeguards at reprocessing facilities. There was a

group formed that developed a guidance -- I think it's called Last Car -- back in the late nineties. And there is some more recent experience with designing safeguards at the Rokkasho plant in Japan which we have learned about.

But I hope that provides some clarity. And if I said anything wrong I invite Tom to help out and clarify.

MR. CAMERON: And one thing that I'd like all of you to consider -- all of you from the NRC -- then we're going to go -- we'll go to Tom now, and then Marshall is -- if it's -- if the applicant can build in safeguards into its design -- it's their option to do that then what does the NRC need to do to be prepared to review that? In other words, what's the NRC's role looking at the -- any safeguards that have been built into the design? Tom?

MR. PHAM: To comment to Tom's comments regarding Part 75 regulation, basically it's the U.S. and the IAEA agreement. The -- one of the tricky aspects of that Part 75 is -- Part 75 will go into effect after the U.S. decides to put the facility on -- we call it the IAEA eligible list. And if the IAEA select that site Part 75 go into -- go in place.

But before that a facility -- a new

facility -- they do not have to comply with Part 75 yet. So that's what I just want to clarify on that.

But in the meantime we become a little bit more proactive to invite the facility to look into that Part 75 implication or obligation in case they are selected to become eligible facility. And through that process we have -- we ask the facility to submit to the NRC and to the IAEA -- we call design information questionnaire.

So basically what is your safeguard plan during your design phase -- during your plant operation -- and that may impact and -- your operation. So basically the retrofitting may be expensive for you if you don't carefully design your safeguard system for your future operation. So that's just for clarification on that.

MR. CAMERON: Okay. Thank you, Tom. Marshall, and then we'll go to Jim and then over to Robert.

MR. KOHEN: I guess I would say from the security side of the house one of the things that we're trying to do with the security rulemaking is to make the regulations more transparent.

And what I mean by that is we've had some situations over the years where we've had to deal with

facilities that have materials that don't necessarily fit into the table per se. So there have had to have been what we talked about yesterday regulation by exception, and we'd rather not do that.

So what we're trying to do with this comprehensive review is get in place a structure that will allow current licensees, as well as applicants, to understand what the regulations are and what the requirements security wise are before they go ahead and start building.

So from that aspect it is sort of security by design is what we're going for. Are we requiring it? No. But certainly we're trying to enable it by making as much clarity in the regulation as possible to allow facilities to say, Okay, what are the security requirements for this type of facility with this type of material so that they can build it into their design or -- and not have to retrofit.

MR. CAMERON: Okay. And, Jim?

MR. BRESEE: Just as a reminder, I think I had a chance to discuss this a bit in our previous discussion in Rockville, but there is a rather large combined Office of Nuclear Energy NNSA program involved in safeguards which, of course, also is applicable to security issues.

And the bulk of this program is devoted to advanced instrumentation which we hope would be of sufficient interest to industry that at the time any decision is made to build a reprocessing plant in the U.S. these advanced technologies would be incorporated just as a part of the overall process design.

Obviously accountability issues are very closely related to process control and other aspects of a separation system. So it is an evolving advanced technology which I personally feel has great promise, particularly when combined with advanced modeling which has the capability in the long run of using a popular term of the construction of a virtual plant -- that is, a plant which is so well described mathematically that is essentially identical to the physical plant.

And when you combine such modeling with improved instrumentation there is at least the long-term possibility of remote real time continuous safeguards. And clearly this -- we're talking about now is an aspect of safeguards by design -- that is, an initial decision that the plant itself will contain those specific items required to meet the requirements of the license process.

MR. CAMERON: Thanks, Jim. And the

virtual design will reveal what should be in the --

MR. BRESEE: [indiscernible]. And it -- likely that some of these advance concepts can be tested in foreign facilities in the near term -- I'm talking now over the next ten-year period.

MR. CAMERON: Thank you. Thank you very much, Jim. Robert?

MR. HOGG: Yeah. I don't want to hog the conversation today, but I do feel like --

MR. CAMERON: Is that a pun or what?

MR. HOGG: I do feel like [indiscernible] has some experience here. We have been selected as eligible facility for certain activities, and I've personally run operations that have been subject to the IAEA's additional protocol, and doing that introduced significant activities and equipment and conditions that if known ahead of time could have been done substantially easier.

I recognize that it's a developing concept. However, any guidance or thoughts prior to or during the development of the technical basis or following regulatory guidance would be just tremendously helpful and serve the best interest of safeguarding the material.

MR. CAMERON: Okay. Thank you, Robert.

Don, Beatrice, on this first question, any concerns that you might want to express or any comments on the whole idea about designing safeguards protection into it up front?

MR. HANCOCK: Safeguards and security are not my issues. I noted that Ed Lyman [phonetic] especially and [indiscernible] had some conversations at the Rockville meeting. But I don't have anything really.

MR. CAMERON: Okay. All right. Anything else on the first question? (No response.) How about the mixed oxide fuel transportation? Oh, I'm sorry. Rod.

MR. MCCULLUM: Yeah. And this is kind of a general point. And security's not my area either, so the specifics of, you know, what's being discussed on safeguards by design I'm not going to weigh on.

But I heard a significant undertone here. One of the things that is certainly my area as well as the area of everybody that works at NEI is regulatory predictability and stability.

To the extent that we have things still to be learned -- things still being developed in the international community we need to weigh in -- learn from what we did in the world of reactors here as well

and make some decisions. I would hate to -- you know, again, this regulatory framework is going to be a key input to the business decisions and the policy decisions that would be made as to what we pursue in the United States.

If security and safeguards is to be a moving target, as it has been in some other areas, that's not helpful. So -- and I think the time line Marissa outlined earlier allows you the time to weigh that stuff and to make the right decisions so that when we do come up with a final rule here we know we got security right and it's not going to be a moving target.

MR. CAMERON: Okay. Thank you. Anything on the mixed oxide fuel transportation requirements? I think, Marshall, you spoke to that issue and what's happening now.

Diversion path analysis -- could someone explain what that means -- what is diversion path analysis? Tom?

MR. PHAM: Back a couple of years ago when we recommend -- when we propose the Part 74 [indiscernible] rulemaking to the Commission and to that Circular OA0059 the Commission directed to staff to consider one of the aspect -- the diversion path

analysis requirement in the regulation.

Basically diversion path analysis is the facility needs to look into their operations, different processes, different activity in material control and include physical protection to come up with different pathway material can be diverted -- can be through some abrupt loss or even protracted losses through small quantity over the time.

So facility needs to come up with different conceivable and credible scenarios for material diversion. And based on that analysis they can [indiscernible] the scenario by priorities. With that analysis the facility should come up with different [indiscernible] measure how to protect or to compensate with those scenarios. So basically it's a detailed analysis of diversion material and countermeasures.

MR. CAMERON: Okay. Thanks, Tom. That's a clear explanation of what it is and what the licensee or license applicant might have to do. When we talk in this bullet -- and this is not just for you but for any of the NRC staff -- about issues or alternatives that the NRC should consider for establishing a diversion path analysis -- we just heard Tom talk about what that means.

Well, what issues or alternatives are there in terms of the diversion path analysis? Maybe what choices are there for the NRC to make in regulating?

MR. PHAM: I want to add more that currently there is no existing regulation for diversion path analysis under Part 74. A proposal for doing diversion path analysis may or may not create a burden which should be imposed upon, you know, [indiscernible], staff, or the facility to do that. So that's why right now it's just a proposal. And we would like to welcome any stakeholder or public comment should we need to do that.

The advantage for that diversion path analysis is to identify or mitigate potential safeguard vulnerability at the facility and also the system [indiscernible] of the whole facility. That's the advantage. But the disadvantage is the cost, the time -- do we need to do that or not.

MR. CAMERON: Okay. So that's the -- the issue is whether to regulate that particular aspect of it. And is it necessary, is it cost beneficial to do that? To a lay person I think it probably sounds like something that would make sense -- we should have diversion path analysis required.

Is there any perspectives on why it might not be needed because there are existing protections in the system? I don't know if any of the -- if the industry has a view on this or Beatrice, Don, anybody on this particular subject. I mean, is it something that just greatly complicates -- it's extremely complicated, extremely hard to use? (No response.) Okay.

MR. PHAM: To me in the audience we -- people are [indiscernible] about giving comment or suggestion for us regarding safeguards and security. But we -- that's what the workshop is for, and if you have any idea it just -- just give us a comment.

MR. CAMERON: Okay. So Tom has put that on the table. We're going to go to Beatrice and we're going to see if there are other views on diversion path analysis requirements. Beatrice.

MS. BRAILSFORD: I do actually think that the discussion at the Rockville meeting was very good. So I will just note that, you know, one of the problems with a reprocessing facility is that it does make nuclear weapons material available. And I would encourage NRC to take whatever steps it deems appropriate to try to mitigate that inevitable effect of nuclear weapons material availability.

MR. CAMERON: Thank you, Beatrice. Marissa.

MS. BAILEY: Yeah. I guess I don't want to create controversy here. But it seems to me that diversion path analysis would be consistent with a risk informed performance based rule -- that it's something that might be analogous or parallel to an ISA but for material control and accounting.

MR. CAMERON: Okay. And --

MR. MCCULLUM: We'd agree with that, Chip.

MR. CAMERON: All right. And is this -- let me ask this question. Would this be an appropriate subject that would be -- and this may go to Robert's point. Would this be appropriate that you would have a design criteria saying that the -- I mean, the applicant should have a diversion path analysis. I'm sort of fumbling around with this, but maybe it ties into your idea about safeguards by design. Robert?

MR. HOGG: Yeah. I guess in a sense any way to help define the envelope, be it by boundary condition criteria or analysis detail will help to ensure that within the framework of what specifically has to be done and what generally is expected -- we're talking the same language.

I mean, we know what to do on a case-by-case basis. And we know what to expect currently on a case-by-case basis. But we probably -- for the benefit of those people who don't know and who are observing and -- from a position of interest but no knowledge want to understand what is being done for this kind of facility and others.

We have a well-defined path forward. ISA -- the equivalence of this kind of a requirement is very consistent with a performance based type approach, and I think that's a very astute point. There are -- just as there are ways of doing safety analysis probably ways of doing safeguards analysis.

And there are probably some very complex ways of doing it and some fairly straightforward ways of doing it. We would want to make sure that people who don't necessarily have experience with the details know what the expectations are both from the agency and from an applicant.

MR. CAMERON: Thank you, Robert. And Rod, and then we'll go to Tom. Rod?

MR. MCCULLUM: Yeah. I just wanted to note, Chip, the way you described that design criteria, particularly in light of the way Marissa described it, is analogous to ISA. That was very

technology neutral. A design criteria to perform the analysis as opposed to, you know, looking at the specific -- you know, and the rigor with which you do that and the methodology and all that.

So I just wanted to compliment you for a very technology neutral phrasing of that criteria.

MR. CAMERON: Yeah. I guess it's sinking in. But thank you, Rod. Tom?

MR. PHAM: To comment more on Rod comment regarding the diversion path analysis, in the past we -- first of all the diversion path analysis is not new. It just -- it's [indiscernible], it's a way the DOE use that in the past, the NRC we use in the past, the IAEA use that in the past.

Actually the IAEA conducted a lot of diversion path analysis for repository. They have different project on repository and they come up with different diversion path analysis in the past.

Within the NRC back in the nineties we start doing that. We used one of our high-risk uranium facility to do that -- and very systematic. And we work with the national [indiscernible] -- with Los Alamos to do together with that particular facility. And the results come out very nice. And [indiscernible] -- that particular [indiscernible]

they used that to [indiscernible] to strengthen their -- save their program.

With regard to reprocessing right now in the gap analysis we -- the staff -- we just propose that diversion path analysis will be in the guidance level -- guidance document level. So at least we can give it to the public or the stakeholder some guideline -- some guidance on how to do that.

The further staff to go into the regulatory requirement -- that's what we -- because our rulemaking is open. So that's why we want the public to give us comment if that's -- every rule when we propose -- subject to the public burden -- things like that.

And, again, like Marissa mentioned [indiscernible] -- should be comparable -- like in the safety arena you come up with an ISA, we come up different accident scenario. In material control and accounting you come up with different scenario. You may lose your material. And it should be neutral depending on your facility -- depending on what type material you may have at your facility.

If you have a lot of americium or [indiscernible] your diversion path analysis will be different. If you just have low-level of low enriched

uranium your analysis should be different. So -- and the material type --

MR. CAMERON: Okay. And, Tom, do you -- this last bullet on issues or approaches for material accounting management, inventories, and holdup -- I guess the diversion pathway would be a subset of -- is it different? Can you sort of explain that to us and see if there are any suggestions from around the table on that last bullet?

MR. PHAM: I want to elaborate a little bit on the -- the fourth -- the last bullet regarding the material accounting management.

We believe that we need approaches to meet the timeliness and the goal quantity for material inventory accounting. And we need to evaluate that for change or for improvement because [indiscernible] reprocessing facility likely will have a lot [indiscernible] -- material [indiscernible] through the facility and inventories.

Because of [indiscernible] and inventory we may need to look at that. Because right now under our Category 1 regulation requirement we have a [indiscernible] quantity limit and timeliness. And so we need to reconsider that to see that if that's okay or not.

For example, during our visit to Rokkasho facility in Japan the Japanese come up with -- discuss with us regarding that quantity -- the limit. The measurement uncertainty associated with inventory -- right now we have [indiscernible] limit in a number.

The international target value have a different number and the Japanese they come up with somewhere in between. And they -- the Japanese share with us their experience. They say that they can do that.

Our current limit may be a little bit stringent. So those different things we like to have people to have some idea to see that if it could be a problem in the future if the facility come into the operation that the timeliness and inventory counting -- and, of course, like Jim mentioned earlier, that [indiscernible] technology now like at the near real time accounting -- that those things could be -- if it's implemented at the facility could tremendously solve those issues.

The other issue at the -- the holdup issue -- material holdup -- the holdup issue -- it happened to everywhere. Every facility always have material holdup somewhere. So we need to come up some idea -- the facility need to come up with some idea how to

minimize that and impact the material holdup to have a better accurate inventory accounting.

And with the analysis we are now the ongoing activity. Now we are advising a lot of our regulatory guides [indiscernible] regarding to physical protection in MC&A. And in those reg guides we also talk about a different way to minimize the holdup issue within different facility. And that's all related to the item we need to ask for comment regarding to the last bullet.

MR. CAMERON: Okay. Thanks, Tom, for enumerating those issues. Robert, do you have some ideas on this?

MR. HOGG: Yeah. I'm really glad that Tom brought these issues up because they are the most germane and most operationally consequential conditions for the facility to consider.

It brings into play my favorite law, which is the law of unintended consequences -- when one wants to do something well one designs a process to do that well and introduces other consequential activities that have to be accounted for and conducted for potentially in the vein of some other safety security activity or even additional accounting type activities. And please do listen to the input of the

stakeholders with regard to these particular topics.

MR. CAMERON: Dan.

MR. STOUT: Kind of following on, as you know, [indiscernible] utilized U.S. national laboratory technology and investments worth many tens of millions of dollars in their facility. You know, it is what I would consider state of the art. And I encourage you to continue to dialogue with the Japanese and Rokkasho, as well as France and U.K.

And, you know, as you know, there's an operational impact in unintended consequences of administering that level of safeguards. And that's better than talking to us. You know, that is the best source of information on cost and unintended consequence that you can get.

And, you know, I think Rokkasho is the perfect example of probably the best that the United States of America can do today. Japanese cooperated and implemented, in cooperation with IAEA, and it exists. It's in place and they're learning now if they can comply, how they can comply, and what the consequences are.

MR. CAMERON: Thanks, Dan. And, Rex, I should just ask you, do you have anything on this? Dan through U.K. into the mix. I don't know if you

want to comment on this issue or not.

MR. STRONG: I think only to pick up on the -- on this point about unintended consequences. And without wishing to appear negative there just is not doubt that as these plants become more sophisticated in the sense of having more and different monitoring systems and more and different surveillance systems, some of which either are real time or close to real time.

With that complication comes other things which the operators have to get right. And ultimately there is a balance. And I'll just say no more than that -- there is a balance.

MR. CAMERON: Okay. Thanks. And Rex used the term complications. And I think, Robert, that obviously ties in with your concern about unintended consequences. And, Dan, do you think that the NRC from looking at the particular facility that you're talking about we'll be able to get an idea of these types of unintended consequences and complications and where the balance is, as Rex put it?

MR. STOUT: Absolutely. You know, I just encourage Tom to not just talk to your counter-part -- that this is a global issue with lots of disciplines and -- you know, this is an area where the NRC is

talking to the right people -- the right facility.

But you need to -- you can't look at material control and accountability in a vacuum. You have to address it more holistically to achieve that balance. That's it.

MR. CAMERON: Thanks, Dan. Thank all of you. It's time for us to talk with the public on this. But is there any remaining safeguard security issues? Marshall had mentioned the term attractiveness and there was going to be a new box I guess for that. Does anybody want to say anything about the attractiveness issue in terms of this particular rulemaking or related rulemaking? (No response.)

Okay. Public, we had -- we've had a discussion of the single step licensing and safeguards. Mike, do you have anything to say on either or both of those issues?

MR. EHINGER: Sorry, folks, it's me again. I feel compelled to address the issue of safeguards by design. And I feel that the NRC is not taking credit for what they have.

You really have safeguards by design because you require submittal of the fundamental nuclear material control plan as part of the

licensing. That forces the operator or the facility people to give thought to safeguards all through their design. So I really believe that you have an element of safeguards by design.

Safeguards by design are three words that are invented recently to cover what we're really doing. And you're doing a very good job in that area.

Now, to address it from the IAEA perspective. I feel compelled to say that there is a gross misunderstanding of what IAEA safeguards is. Because what you do at the facility level for fundamental nuclear material control plan and for domestic safeguards you report certain information to the national system.

That gets forwarded to the IAEA. And IAEA safeguards is only -- and this is the misunderstanding -- the verification of what the facility operator says and is reported through the state system.

Now, addressing safeguards by design at the IAEA side -- they're not taking credit for what they have. Tom mentioned the submittal of the design information questionnaire. That's a very formal process within the IAEA safeguards activities.

That follows or kicks off something called negotiation of the facility attachment. That's a long

period of negotiation between the IAEA and the facility operator through the national system to set up the equipment and the needs that will be used for inspection for verification of the declarations.

That's independent equipment from the operator. It's stuff that's used by the IAEA to verify the declaration. That's a long process that -- it's a formal process that goes through the whole construction period.

The example of [indiscernible] -- that took place over something like 12 years. And that process of negotiation of facility attachment results in a published facility attachment at the end of it. And it kicks off the preparation of what's called the safeguards approach. And that's done by the IAEA. And that's where they say how they're going to use the equipment that was installed and negotiated through the facility at that --

So they have a formal safeguards by design process that was exercised well and performed well through the whole period of the safeguards project at [indiscernible].

So, again, it's something that's talked about and they want to formalize it into something called safeguards by design. But the process is there

-- it just needs to be formalized. And it works fairly well.

So I think both sides are not taking credit for what they have in place already. And I think there's a misunderstanding of how IAEA's safeguards works.

It all falls down in the case of the U.S. The facility attachment process -- the safeguards -- the whole safeguards by design process worked very well at [indiscernible] because [indiscernible] is a non-weapons state and is subject to [indiscernible] CIRC 153.

The U.S., as we heard today, is slightly different as a weapons state subject to [indiscernible] CIRC 66 type agreement. And that involves this process of offering facilities for selection and then selection.

So we tend to lose sight of the whole process of safeguards by design in the U.S. because we don't have that formal process. We don't put the facility on the eligibility list, and the IAEA doesn't select it. In weapons -- in non-weapons states it's automatic and the process occurs.

So we have the problem in the U.S. of establishing a dialogue that is in place for

safeguards by design with the IAEA, but we don't do it. And the IAEA isn't interested in spending their resources and their money to -- it was very costly to implement safeguards at [indiscernible]. And the IAEA doesn't have the money. The U.S. has to decide if they're going to make -- or essentially force safeguards by the IAEA on a facility like a reprocessing plant in this country and formalize that approach.

Robert talked very well about the issue of being selected. And then all of a sudden they show up and they have to bring new equipment because there was no negotiation. And it's a function of being a weapons state and under [indiscernible] CIRC 66 type agreement.

So the process is there. The NRC has a very good safeguards by design process. The IAEA has a very good safeguards by design process. But the issue to be dealt with is how it's going to be implemented in U.S. facilities. I'm sorry to take up your time with this stuff.

MR. CAMERON: No, Mike, don't be. Don't be sorry. We appreciate what you've been saying. Okay? So thank you. Anybody else? (No response.) Okay. Rex.

MR. STRONG: Just to comment on that last comment if I may. U.K., of course, is also a weapons state and has therefore had to address this issue by being very clear about the facilities that will be entirely within international safeguards and those that will not. And having made that decision all the rest can then follow.

MR. CAMERON: Thank you, Rex. And I see Marshall is nodding his head affirmatively on that. Okay. It's Mike again.

MR. EHINGER: If you'll give me one more minute it's a very important point. France and the U.K. are weapons states. However, you heard Rex say that they're subject to IAEA -- or [indiscernible] safeguards. That's an activity within the European states.

I -- they are subject to some IAEA -- a very limited IAEA inspection. IAEA generally accepts the conclusions of [indiscernible] for safeguards implementation. However, they do inspection because both of those facilities, Thorpe and COGEMA, due process for foreign countries, i.e. Japan. So they do inspect in the pool area and the storage area because it's materials that belonged to a non-weapons state. But they don't inspect in the facility itself, and

that's a very important point.

MR. CAMERON: Okay. Thank you. Are we going to swat the tennis ball anymore? No? Okay. Well, good. Good discussion and I hope that Tom and Marshall may have gotten some material for thinking about how to proceed.

We have the very important issue of waste management coming up at one o'clock. And that's when we will be joined by the NRC staff person who will be teeing it up for us, Mike Lee.

We also are going to have two members of our panel who will have to leave, Jim Bresee and Dan Stout. And I just want to express all of our appreciation to you both for being here.

And I wondered if you -- the two issues that we have -- waste management and environmental protection this afternoon -- I just wanted to give you an opportunity if you had anything that you wanted to say about either of those issues. I'll put them in the parking lot and we'll throw that into the mix this afternoon. And I'm not saying that you need to, but I just wanted to give you the opportunity if you wanted to just flag an important issue. It's totally up to you.

MR. BRESEE: One of the things that has

been emphasized in the Blue Ribbon Commission discussions of reprocessing -- and there's been a lot -- I'm sure you're familiar with it. A very good public record is available. In fact, one can go back and actually be a witness of the -- to the actual presentation.

A good deal has been said, and rightfully so, about the additional waste management issues associated with reprocessing as contrasted with the ones for refuel cycle. And I just wanted to make the point that it's being taken very seriously within the Office of Nuclear Energy now.

We have an office devoted to storage and disposal. It contains a sizable fraction of the Office of Civilian Radioactive Waste Management staff. Therefore, we're not losing all of the wonderful background accumulated over the life of the Echo Mountain Project. The head of that office, Bill Boyle, is based in Las Vegas and a fairly large number of the staff members in that office are in Las Vegas.

We have a sizable systems engineering study, and a good deal of that effort is devoted to trying as best we can to project using the most advanced technology currently known -- the quantities and characteristics of various waste streams

associated with advanced fuel cycles.

It is certainly of common interest that the United States do an improved job of characterizing the various waste associated with reprocessing so that we can ultimately end up with a safe and secure system from the standpoint of public exposure and environmental -- potential environmental damage.

I will make one additional comment on the environment protection issue. I mentioned this in Rockville -- I'll repeat it here. A good deal of our current interest is on improved methods for handling radioactive off gas. We're fully aware of the fact that we will -- that any advanced separations facility in the U.S. will probably have as one of its requirements the capture and effective management of radioactive iodine. So probably the largest single effort that we have right now from an advanced technology standpoint is in that area.

But we're also conscious of the fact that the EPA is reconsidering some of the issues associated with radioactive gas release, and, in particular, the uncertainties surrounding krypton are significant. I'm sure our NRC colleagues are aware of that particular issue.

But I reported recently in a weekly report

within [indiscernible] that was much encouraged by some recent experimental data that I'll mention which I think offers the possibility of new approaches to off gas containment.

In a recent study using a copper based metal organic framework structure experimentally there was quantitative separation of krypton from xenon. This is only a single experiment, and we're going to be doing a lot more work in that area.

But it's attractive in that it suggests the possibility of improved economics in the separation of those two materials. And since there's ten times as much xenon as krypton in nuclear waste and xenon is non-radioactive and has commercial value that the net consequences may have some impact on overall economics of separation plants.

MR. CAMERON: Thank you. Thank you very much for that, Jim. And we'll put both of those issues -- better job of characterizing waste from reprocessing and the off gas issue in the parking lot and we'll see how that plays out in those discussions. Dan?

MR. STOUT: I'll start out at a really high level and then burrow in. But a lot of folks have said what's TVA doing in a room and why do we

have an interest. You know, we're a utility. The fact of the matter is we're very committed to nuclear energy. And we have six operating reactors, we're building one, we're looking at -- we're in the process of developing another at the [indiscernible] site. We're looking at small modular reactors. We're looking at way to diversify our fuel supply options with MOX, et cetera.

And it's in that context -- a commitment to less coal, more nuclear -- and we're not unique. Other utilities in this country are also very committed to nuclear energy. They're just figuring out ways to get going on it.

And that's a different paradigm. By the time a recycling facility will be operational in this country there's going to likely be 100,000 metric tons of used nuclear fuel. If we build a reprocessing facility the size of those that have been built recently in U.K., Japan, France -- you're looking at 800 metric tons -- you're still only one-third of the rate of generation in the United States. So that -- it's going to be decades before we're managing used nuclear fuel at the rate we're generating it.

It's in that context that TVA believes that recycling makes sense -- that used fuel is an

asset -- it is a resource. It ought not to be disposed. So, now, why do you do recycling? There's two reasons. One is to get to more efficient utilization of the resource. You're making more fuel. The other is to package the waste in a way that's better for disposal.

Now, used fuel going to Yucca Mountain was retrievable. It's monitored retrievable storage in a very secure way. And that makes sense in a [indiscernible] cycle with 104 reactors that are going to end their useful life and no new nuclear plants. That makes no sense.

If we're in a growth scenario perhaps there are other options. And so what does a utility want? Utility wants options for used fuel management. Yucca Mountain's defensible. Technically it makes sense. Yeah, we'd like to see that as an option. But we'd also like to see recycling.

So in terms of enabling recycling to happen in the United States rulemaking is one of the necessary dominoes. Before you can build a plant you need to know what the rules are. Once you know the rules you can design the facility, then you know the cost of it, and then you can formulate the business case.

Now, I understand it's iterative -- that the NRC needs to understand the designs to come up with the rules. There's an iterative process there. The point is you've got to have rulemaking, then you'll have designs, then you'll have cost estimate, then you'll build your business case, and then you'll see construction.

And so we encourage the NRC to continue down this path to complete the rulemaking. And I think that there is going to be a side benefit of you being much better informed and able to respond to the Blue Ribbon Commission and help them understand the issues associated with recycling and help and form policy for this country.

And I totally agree with Jim. You know, we need to keep doing the R&D. We need to keep coming up with ways to better perform material control and accountability, to reduce emissions. And that's not inconsistent with what we've seen taking place in France and in the U.K. If you look at the emissions the trend is impressive. It's orders of magnitude reduction. And that's normal process. You improve your processes.

And so from a utility perspective I'd like to see us start with what can be done today and

continue to make improvements. And starting with what's available today doesn't preclude future options. So we'd like to see aqueous reprocessing facilities. We'd like to see electrochemical reprocessing facilities. We'd like to see fast reactors some day. We ought to get on putting the rules in place to enable that system to be put in place. Thanks.

MR. CAMERON: Okay. Thank you, Dan. And thank you, Dan and Jim, again for being here and -- are you going to leave? No, I'm teasing. I'm teasing. I just want to say that the agenda item that we don't have on the agenda is that everybody will get an opportunity at the end to make the type of comment that Dan has made too.

So, go ahead, Mike.

MR. EHINGER: One parting shot to support what Dan and Jim said. Dan put his finger on a very important point about the fuel and fuel generation and how long it's around.

And the U.S. is in a very, very unique position that if we build a reprocessing plant in the next 20, 30, 40 years it will be able to process fuel that is more than 50 -- almost 100 years old. And when it's that old most of the bad stuff has decayed

away.

And so it will be much easier to handle from the waste point that Jim is making mention of, and it's going to be a much different plant than what we see around the rest of the world. And the U.S. is in a very unique position to be able to do that with the old fuel that we have.

MR. CAMERON: Thanks, Mike. And the reason I added that in about the opportunity to make any closing statements about the process or whatever -- because I think that I anticipate there might be different views than what we've just heard. So I want everybody to have a chance to express that.

And, with that, I think we're at the lunch break, which is scheduled for an hour-and-a-half. And it essentially has to be because of the fact that we need our staff person to tee it up -- waste management.

But we'll have a full discussion of waste management. We'll have a focused discussion on environmental protection. And then we'll go around the table to see if -- what everybody has to say in closing. And that will be that.

So thank you. We'll be back at one.

(Whereupon, at 11:30 a.m., the meeting

adjourned to reconvene at 1:00 p.m.)

A F T E R N O O N S E S S I O N

1:07 p.m.

MR. CAMERON: Okay. Welcome back everybody. And we're going to get started with the waste management issues relevant to reprocessing rulemaking. And we have Mike Lee from NRC headquarters. Mike -- FSME -- right? That's the correct office? Well, I was just going to ask you. So, Marissa, I guess you're the only one. You get the prize. You were reading it. Okay.

Mike is going to tee that up for us. And there's some questions that -- at the end relevant to high-level waste [indiscernible], low-level waste. So -- and wherever else that all of you want to go with it.

Mike, are you ready to start us off?

MR. LEE: [indiscernible].

MR. CAMERON: Well, none of the rest of us will be here but you certainly can.

MS. BRAILSFORD: Chip, are there any copies of his presentation?

MR. CAMERON: I'm sorry. Beatrice?

MS. BRAILSFORD: Are there any copies of his presentation handouts?

MR. CAMERON: Jeannette, do you think we

can get some hard copies at least for Beatrice and Anne of the Mike Lee presentation? Okay? We'll get them, Beatrice. All right. Mike? Oh, let me tell you -- this is sort of -- this is awkward for a presentation because what you have to do with this is hold it down the whole time. Okay? So either you can come up here or I can give you this --

MR. LEE: I'll go up there.

MR. CAMERON: Okay. All right.

MR. LEE: Okay. Thank you, Chip. I think if I'm not mistaken probably over the last day or so there's been a lot of conversation about the reprocessing effort, of course, and, in particular, the staff's desire to go about this process in a way that's as neutral as it can be in terms of not favoring a particular technology.

But the -- regardless of whatever technology is used in reprocessing if we ever get to a state where we have an operating facility there's going to be waste streams associated with that technology. So I'd like to talk a little bit about the waste side of reprocessing in terms of what the staff's thinking is right now, vis a vis the regulatory analysis that was done -- the Gaps. So hit the next button.

The first couple of slides are intended to be nothing more than some context for how we go about looking at the waste issues. PUREX I'm presuming has been talked a little bit about over the last day-and-a-half or so. The -- introducing PUREX at this point is only intended again to give you some context to think about a process and what waste streams might be associated with that process.

So the takeaway from this slide is that you're going to have waste streams. The waste streams are going to need an appropriate disposition that ensures adequate public health and safety. I'll just move to the next slide.

This cartoon is intended to kind of capture conceptually what might be considered to be through puts with a typical type of PUREX facility. Alex Murray, who isn't here today, put this together. It's intended to be more conceptual. But the points that I want to acknowledge in this slide -- or what the three streams that you see I the lower right-hand corner -- or quadrant.

If you consider the PUREX process there's the expectation that you're going to generate some type of waste which is currently or conventionally referred to as high-level waste. You may also have a

waste that's possibly high-level waste -- or GTCC like greater than Class C as well as what you might recognize or consider to be low-level waste. And this is kind of forming the basis for the regulatory Gaps that we're interested in on the waste side of the program.

MALE VOICE: Mike, what was TE in that graph? Go back. High-level waste 50 TE.

MR. LEE: Is that ton equivalent?

MR. CAMERON: We need to get all this on the record.

MALE VOICE: Yeah, I had my button on. I was asking -- the notation TE apparently is ton equivalent, which I guess makes sense.

MR. LEE: I believe we're seeing Alex's English prejudice here to use the European system -- or the convention. So the TE is in reference to ton equivalence. And I guess that's -- is that T-O-O-N-E-S? I see -- okay. I see on nod. So I'll take that as I got it right.

MS. REED: Yeah, it's a metric ton.

MR. LEE: Okay. Metric ton. Thank you. All right. So having captured the flow chart mind there's the expectation that you're going to have one waste stream that could be considered to be high-level

waste. And that waste stream is highly radioactive. It's -- if you follow the Nuclear Waste Policy Act it's the type of waste that would go into a geologic repository.

You're also going to have some non-high-level waste -- and we'll talk more about these definitions in a minute -- that is also very highly radioactive. But there's different disposition path other than deep geologic disposal.

The system that's currently been placed in the United States relies essentially on characterization by origin rather than hazard. I think if you go to the IAEA system that's described in Geologic Safety Guide 1 -- I think it was published in 2008 or 2009 -- they have a slightly different way of categorizing the waste streams. The U.S. historically has gone about it a little differently.

The -- turning now to high-level waste there's a number of regulatory references, if you will, that provide a definition for what it is. Definition in 63.2 is in reference to the site specific Yucca Mountain standards. And that definition is also repeated in Section 72.2 of NRC's regulations. It also includes besides the liquid waste, if you will, irradiated spent fuel and other

highly radioactive material that determines -- needs disposition in a -- through geologic isolation.

And the expectation is that regardless of whatever reprocessing technology is arrived at in the context of the regulation there's going to be some high-level waste that comes out of that waste -- that process.

And turning to the PUREX -- again, just as an example -- these are the examples of the types of high-level waste streams that can be expected from that process. And, again, if folks need this for -- copies of these slides we can make arrangements to get them.

I was asked to put in a cartoon of what some of the disposition paths for some of the high-level waste looks like right now. So here's the cartoon to make this talk a little more interesting.

Other materials that may come out of the recycling -- or, excuse me -- the reprocessing cycle, if you will, could be uranium, plutonium, volatile materials, other materials that are associated with the chemical engineering aspects, if you will, of reprocessing.

There's also going to be some non-high-level waste. And this is typically what we refer to

as commercial low-level waste. It's currently managed under 10 CFR Part 61, which is the Commission's low-level waste disposal regulation. It includes some material that's slightly irradiated, personal protection equipment, and other materials -- ion exchange media -- things like that.

Referring back to the European system, they -- if you go back to that IAEA guide I made reference to there's further refinement in the definition of those waste class -- of the low-level waste class. They provide a little more detail in how that waste stream is going to be managed.

So turning to the regulatory gap analysis that was completed a few years back, there are three gaps that are particularly important to the area of waste management. One is Gap 3 which is what are -- what waste might be incidental to reprocessing. And it's been treated as a high priority gap.

Gap 15, which I'm not going to talk about today, is analogous somewhat to the waste confidence decision that exists for nuclear power reactors.

And Gap 16 is the waste classification scheme. After you've identified what waste streams might be associated with the reprocessing technology how do you intend on dispositioning them, if you will.

And that's the intent of Gap 16.

Turning to Gap 3, for those of you that might be familiar with the DOE program, there's a -- there already exists a definition of waste in the sense -- incidental to reprocessing. That waste stream is possibly similar to what we might expect to be associated with a commercial reprocessing facility.

So -- but the difference between commercial waste incidental reprocessing and the defense waste incidental reprocessing, if you will, is that the commercial site isn't currently defined.

And if you go back to the existing suite of radioactive waste classifications, if you will, that exists out there we have high-level waste, which is defined in statute as well as in regulation. That includes spent nuclear fuel. There's a discrete definition for true waste, which are managed by the Department of Energy. Low-level waste, of course, is managed by NRC. And greater than Class C waste, which I guess you might -- it could be argued is somewhat equivalent to the DOE true waste but on the commercial side.

And as -- if you go to the NRC website in the -- there's a list of publications that are electronically available. And some of the history on

the evolution of these definitions is found in Appendix B of Nureg 1853, which is I think the history of low-level waste regulation within the NRC. But there's an appendix that describes how these definitions came about because low-level waste, for example, is kind of a -- is defined by what it not is as opposed to these other definitions are very specific to what the waste form is.

Gap 3 -- Gap 16 was concerned about what type of -- how to define what the waste stream it. Should it be low-level waste, greater than Class C, or high-level waste? Gap 3 is more concerned with after you've come up with a definition -- what might it's disposition be.

And if you look at the various waste classification schemes under the first tick you see high-level waste spent fuel true and greater than Class C, at least domestically by convention is envisioned for some kind of geologic isolation.

By regulation low-level waste is deemed suitable for near-surface disposal in shallow land disposal scenarios that rely on some limited engineering. And if you look at the DOE program right now it's been determined that DOE can dispose of those wastes in situ through grouting and the use of some

other limited engineering measures.

So the question that this -- the Gap team, if you will, is interested in is for a commercial reprocessing facility. What should we propose for the disposition of weir type -- or weir like wastes, recognizing that not all waste streams are going to be high-level waste and that you're likely to have large volumes of waste streams that might be more similar to what is currently managed under a Part 61 type of regulation.

So in terms of some potential options -- and that's one of the things that we're hoping to hear from the public about -- is there's different ways of -- or at least in regulatory space assigning a home for some of these waste streams.

We -- as I've already pointed out that there's current definitions in place based on statute and regulation. And one of the things that I haven't talked about is that independent of the processing effort the staff have been tasked by the Commission to exam approaches to a wholesale revision of Part 61 -- that it was recognized recently in light of issues related to the disposition of depleted uranium that some questions have come up about the flexibility of the regulation to handle new and emerging waste

streams. Reprocessing, of course, would be one of those waste streams potentially.

So at the end of the calendar year we have a paper due to the Commission that examines some proposals that would address how we might revise and possibly improve the low-level waste framework to deal with new and emerging waste streams.

Gap 16, as I mentioned before, gets back to how are you going to specifically treat weir-like wastes. By default if you turn to NRC's low-level waste regulation there's some waste classification tables in Section 61.55. For those of you who aren't familiar with those tables in too much detail the history behind the development of those tables is that when the regulation was first put together the staff surveyed waste generators at the time as part of the NEPA process and determine that there were approximately 32 waste streams that were out there in the commercial environment that might be suitable for disposition under the Commission's low-level waste regulation.

After evaluating those waste streams it was determined there were about 24 radionucleids of interest that needed to be evaluated. And through a series of analyses that are described in the draft

environmental impact statement it was determined essentially that there were 12 radionucleids that were, if you will, kind of influencing what doses could be to potential receptors. And those, depending on concentrations and half lifes, they've been divided into the class on tables 1 and tables 2.

The issue is that if you look at any particular reprocessing stream you're likely to identify radionucleids that weren't considered as part of the earlier NEPA analysis. So the question is do we go ahead and rely on the existing Part 61 methodology, if you will, to classify them as default Class A or is there merit in going back and revisiting the regulation in total and developing a new classifications scheme within the regulatory framework itself.

So -- I think this is my last slide. To kind of sum up things I guess the questions that we would like to hear from the public about is what alternatives or options should NRC consider for the independent storage of reprocessing high-level waste. Are there alternatives or options which NRC should consider for the management of the non-high-level waste reprocessing stream?

When you look at the storage of

reprocessing waste is there some time limit that's appropriate to consider? In the past in reactor -- in the reactor program the Commission has expressed a preference for how long you can store waste on site before you move it to some kind of disposition path.

The next thing is should the waste incidental to reprocessing concept be implemented for a commercial fuel production facility as it currently is under the DOE program -- because that's a scenario for which the staff has some experience right now.

And then, lastly, what specific performance assessment requirements should be considered as part of any reprocessing regulatory framework.

So thank you for your slides and we'll try to answer questions and engage constructively.

MR. CAMERON: Great. And, Mike, just so you can relax, I think you probably can --

MR. LEE: Oh, okay.

MR. CAMERON: You can go and use your --

MR. LEE: I better turn this over.

MR. CAMERON: -- microphone.

MR. LEE: The button.

MR. CAMERON: Okay. Before we get into any of these questions -- and I think there might be

some clarifications needed on what some of these questions mean. But are there questions for Mike on his presentation before we get into discussion of some of these issues? And, James?

MR. ROSS: You know, Mike, to me this waste management issue seems to more of a political issue than anything else. Has the NRC been working with the BRC any? Have you interacted any with them? Did you talk to them at all about some of the information you put on your slides?

MR. LEE: Lawrence Kokajko's in the audience and I think he can raise his hand because the -- but for everyone's benefit the BRC is the Blue Ribbon Commission that's been tasked by the President to look at I believe the entire fuel cycle -- nuclear fuel cycle. It's my understanding though that most of those discussions have been in the context of spent nuclear fuel and high-level waste.

The short answer is -- at least in the low-level waste area I'm not aware of anything, but I welcome any friendly amendments from Lawrence.

MR. CAMERON: Before we go to Lawrence though, James, what -- when you say this is a political issue what do you -- do you mean policy? Or what do you mean --

MR. REED: Policy [indiscernible].

MR. CAMERON: Policy issue. Okay.

MR. REED: The questions we're asked to discuss are what alternatives and options should the NRC consider in the storage or high-level waste.

MR. CAMERON: So your view is that perhaps some of these are policy issues that are going to be addressed outside of the NRC. Okay. And let's all remember to do those buttons. Let's hear from Lawrence Kokajko. Lawrence?

MR. KOKAJKO: Thank you. In fact, the NRC has had several discussions with the BRC in public forum. Most recently Tim McCartin of my staff addressed that as a panelist there. And, in fact, I understand that the chairman is soon to be meeting with the co-chairs of the BRC.

The -- we have monitored every session of the BRC, including the subcommittees, which, as you may know, is, you know, looking at reactors, fuel cycle, and, of course, waste and reprocessing.

So those things we have been monitoring. When we've been asked to participate we have done so. And we have also engaged with the BRC staff on a number of issues on how best to convey a regulatory perspective, but also to give some insights into the

current programs and the like.

We, too, are waiting for the BRC draft report, which is maybe due out as early as July of next year -- and it could be even earlier I understand -- and, of course, the final report, which is due out in January 2012.

MR. CAMERON: But in the meantime -- there was a suggestion on James' part that the NRC doesn't need to worry about addressing these until they see what comes out of the Blue Ribbon Commission. I think that -- I think the answer would be is that the NRC is still going to go ahead and try to address these issues. Lawrence?

MR. KOKAJKO: We quite frankly feel that we need to be prepared for whatever eventuality comes to pass. We don't want to be caught short if all a sudden the BRC is thinking about doing something else and we've not prepared adequately for it.

We have -- in fact, my division has prepared itself to look at the integrated strategy which the NRC published earlier this year and taken a look at whatever waste forms and waste media that it would be disposed in. So we believe that we will be staged for whatever the BRC comes out with and whatever the evolving national policy comes to pass.

MR. CAMERON: Okay. Let's go to Rod and then Mike. And then let's go to Don.

MR. MCCULLUM: Yeah, I'm glad James asked that question because I was sitting here staring at these first two questions thinking that perhaps they represent a bridge too far in terms of what it is that NRC does. NRC regulates safety.

And I guess I'll introduce here similar to the technology neutral term that we've been talking about -- and that's policy neutral. What NRC needs to do is address the classification of these wastes -- these waste forms in a manner that best serves public health and safety.

As far as them, you know, meeting those requirements here are some policy decisions that may be up to the licensees, that may be up to the policy makers, it may be influenced by the Blue Ribbon Commission recommendations.

One guiding principle I think that should be in this when you think about, okay, how do we do a policy neutral regulation here -- and I'm going back to -- for those who came in late in this movie we heard some pretty heartfelt expressions from the activists towards that end of the table -- not you, Robert, you know who I'm talking about -- who --

regarding the -- I would call the materials still stranded at past reprocessing sites.

And one of the things that cause that -- West Valley was mentioned, for example. One of the things that cause that to happen is the unavailability of geologic disposal. So to the extent that -- you know, in the first question it really isn't up for NRC to consider the alternatives in terms of where we're going to store these things. But to the extent that materials don't need to be disposed of in geologic -- in deep geologic disposal classifying them accordingly and providing for that classification allows the materials to be appropriately disposed of -- dispositioned -- and allows some of those sites to be cleaned up.

And we all know that with decisions -- policy decisions that are not safety decisions that have recently been made the geologic disposal is much further in the future than we might have thought five years ago.

So I think it's sound regulatory judgment to really ask that question of if a waste form doesn't require geologic disposal do we provide a classification framework that allows another disposition path that will protect public health and

safety. And then, you know, it's up to the applicants to determine what they would do with those wastes to meet those requirements.

MR. CAMERON: Okay. And we're going to go to Mike. But I want to check in with all of you on what Rod has just said also -- get some reaction to that and from the NRC. What do you read -- what are the implications do you read for the NRC regulatory program -- do you read into the remarks that Rod just made. And let me go to Mike and let's hear from Wendy before we go over to Don and Beatrice. Mike?

MR. LEE: I don't want to get on the soft ice yet, but I would expect this part of the NEPA evaluation that the staff would conduct is part of the development of its regulation. There's going to be some discussion as to the waste streams and how those waste streams are managed and approaches to the management of those waste streams from the practical standpoint as well as an environmental perspective.

So I don't have the answer right now as to what that determination would be because the NEPA process would have to go through its cycle -- it would have to reach fruition. But I don't think that decision's been made a priority at this time, but I would expect that there would be some discussion of

that issue in the context of any NEPA review.

MR. CAMERON: Okay. And thanks, Mike. And I hope you're here for -- with us for the rest of the afternoon. Our next agenda item that Miriam is going to facilitate on environmental protection we're going to try to spend some time focusing on what the scope and nature of any NEPA statement on this rulemaking should be. So thank you for that. And, Wendy?

MS. REED: Yeah. I just wanted to give a -- I guess a clarification of the first question. The basis of this question is that right now high-level waste is regulated by the NRC I believe under Part 72.

But for a commercial facility -- if I have this right, then a commercial facility could only store spent nuclear fuel. High-level waste from reprocessing I believe would currently be stored at a monitored retrieval storage, which is run by the DOE.

And so regardless of when a geological repository comes into play I would think that a commercial reprocessing facility would need to store high-level waste for some period of time. And I think that's where that question comes from.

Also there's the Appendix F in Part 50 which stipulates times that high-level waste can be

stored in a commercial facility. I think -- and right now it says liquid waste is five years and then solidified high-level waste is ten years, and then it has to be shipped to a repository. There are some things that need to be addressed.

MR. CAMERON: Okay. So that you're saying there is some -- there are some requirements now.

MS. REED: Yes. Gap 2 addresses the situation with storage of high-level waste.

MR. CAMERON: Okay. Thanks, Wendy. And I think we'll probably --

MS. BRAILSFORD: Wendy, could you just repeat the very last part of your statement about the five and ten years? I missed some nouns.

MS. REED: There's Appendix F in Part 50 which relates to reprocessing. And I believe, if I have this correctly, it stipulates some times for storage of high-level waste.

MR. CAMERON: Okay. Appendix F, Part 50. Since I want to get all the NRC staff statements out before we go to Don to Beatrice and Jim -- so, Marissa --

MS. BAILEY: Yeah, just a clarification that Wendy made. Interim storage of high-level waste and spent nuclear fuel is regulated by NRC under 10

CFR Part 72. And for the storage of high-level waste right now the way Part 72 is written it has to be stored under monitored retrieval storage, which is what would be run by the Department of Energy. So DOE would be the licensee.

And I think the question here that's being asked really is what alternatives should NRC consider when it comes to interim storage of high-level waste. Is that correct?

MR. CAMERON: Okay. So good clarification -- interim storage. Don, there's been a number of things said and you've had your card up for a while. Go ahead.

MR. HANCOCK: Well, I guess one of the things that's been a little surprising to me on virtually everything we've been talking about for the last two days industry has pretty clear-cut ideas. So I'm a little surprised that the industry folks don't have suggestion or suggestions about the first question. Okay. Good. So I'll -- that was going to be my question -- who's going to speak to that. So we know who that's going to be. So that's good.

And the second question the same way. Currently industry does have specific plans. All the non-high-level waste that industry has they have plans

for. Low-level waste they have very specific and requirements for.

So I guess my first question is why -- from an industry standpoint why are the wastes from hypothetical future reprocessing considered so differently than existing industry wastes in terms of how you would deal with them. And then related to that, of course, is NRC has gotten a lot of guidance from industry about other issues, so I would presume that NRC would be interested in some industry guidance in terms -- seems to me a reason for the questions -- what is industry thinking -- what are its plans in that regard.

Let me just say before whoever wants to respond to that the third question relates to time limit considerations. I think one of the things that's important is that clearly -- and, you know, government lack of fulfilling its requirements or whatever -- clearly time frames for storage of the designs -- the original designs of existing power plants assumed shorter time frames, design necessity, storage necessity -- on site for considerably shorter time frames than what's been shown to be true.

And I would think that for both industry and NRC in the case of reprocessing facilities they

need to take that lesson learned into account and have clear discussions in any licensing -- in the rules first and in any licensing applications about potentially decades-long periods for storage, either on site or some place else.

That clearly needs to be required and, I mean, my point is to not repeat the mistakes that we've seen for the last several decades.

MR. CAMERON: Okay. Good. Thank you, Don. And after we hear from Beatrice we're going to go to Jim Lieberman to address those questions. Beatrice?

MS. BRAILSFORD: I was just, like Don, and I think probably the NRC folks as well, confused why NRC -- why anyone was uncomfortable with the notice that NRC has a role to play in the storage of nuclear waste.

I hope as we go through this list we get to talk more about some of these other bullet points. But I will note that the reprocessing sites with which I am most familiar are not commercial -- they are Department of Energy. And they will be contaminated until the end of time regardless of what disposal option is chosen for [indiscernible].

And reprocessing has contaminated crucial

water resources in this country. And I know you're going to say you did it better -- you're going to do it better. But you -- we must not dismiss and say if we could get this spent fuel off those sites or the high-level waste and glass form off those sites they would be clean. They will never be clean.

MR. CAMERON: Okay. And, Rod, did you want to respond to what --

MR. MCCULLUM: Yeah. I'm not actually going to counter that because she is correct that those were not commercial sites. And what we're talking about here is how we would regulate future commercial sites. And for me to promise that, you know, we'll do it better -- well, of course, we will, but I don't think that's going to be satisfying either.

What we're talking about here is how we put in place a regulatory framework that will require it be different at future commercial reprocessing sites. And I'm going to let the expert talk about some of our visions for these materials.

But for high-level waste we right now have a regulatory framework which is problematic, as Marissa has pointed out, because it's forcing it to an MRS and forcing it to geologic disposal. We have a

lot of materials that aren't high-level waste where perhaps they also would be headed for geologic disposal because of where they came from.

We need a regulatory framework that allows us to appropriately dispose of all these materials in the most expeditious manner possible so that we don't with a future commercial site end up in the place that I think Beatrice is talking about from some of the past sites.

So, with that, I'll go to Jim and I think he'll talk about the vision that industry has laid out for these materials.

MR. CAMERON: Okay. And before we get to Jim I need to ask Rod a question because I'm worried around that maybe all of us are misconstruing something that you said earlier in light of what you said now. But, Mike, do you have a --

MR. LEE: Just a quick point about storage. There's an effort underway right now being led by Jim [indiscernible] of the NRC staff and [indiscernible] that's looking at all guidance related to the storage of radioactive waste. And I know they have a placeholder in that effort to look at reprocessing waste.

But the issue that is recognized and has

come up in terms of storage plans at nuclear power plants as well. So I know that they're -- Jim's group is to get back to the Commission ultimately with some observations and advice on how that guidance might be amended to kind of deal with the real world as opposed to what hypothetically was least thought to be the practice at the time or --

MR. CAMERON: Okay. Another moving part. Thank you. Rod, to paraphrase Beatrice -- she -- I think she was asking you -- I don't know why you, Rod, think that the NRC shouldn't have some role -- action to take in terms of this --

MS. BRAILSFORD: Why were the first two bullets --

MR. MCCULLUM: I'm agreeing with her.

MS. BRAILSFORD: -- [indiscernible].

MR. MCCULLUM: I -- that's why the first -- my reaction was the same as James to the first two bullets. It is not NRC's job to make policy decisions. It is for them to put in place a regulatory framework which -- I'll use the term again policy neutral -- will allow policy decisions to be made and implemented -- most importantly, implemented -- in a way that will protect public health and safety. They can't be lined to policy, so what Lauren

said about their relationship with the Blue Ribbon Commission is important.

But looking at the hazards of these wastes -- and I think it's an absolute given -- and it's not a policy call because any policy that we make geological disposal is a way off. So it's a given input here that geologic disposal is in the distant future.

So, therefore, looking at classifications and storage requirements -- for example, storage under Part 72 -- we're going to be looking at longer-term storage of spent nuclear fuel. It would seem to me that the reprocessed high-level waste forms should be as robust for long-term storage as well. And, again, the key is those things that are high-level waste -- giving a classification to them that will allow them to be dispositioned in a way that is doable and will help sites from becoming from contaminated -- because sites become contaminated when materials are just left there, not properly tended to, and have no disposition path.

But, with that, I really would like to drive the discussion back to Jim who can talk with a little more authority as to how we've tried to provide our input on such a classification scheme.

MR. CAMERON: And I think that perhaps the best solution -- or resolution here to some confusion perhaps is to key on the fact that you talk to the need for an effective NRC regulatory framework for managing these wastes. And I think that's what Jim is going to talk about.

MR. MCCULLUM: Yeah. Remember what we said at the outset -- this regulation is an input to policy making decisions. So -- and that's vitally important. The policy makers need to be well informed, and that's why this is important.

MR. CAMERON: Go ahead. Go ahead, Marissa.

MS. BAILEY: Yeah, before we go to Jim, I think I want to agree. The intent of these two questions were not to get into policy decisions that is not in the NRC's purview. What we're trying to get into with these two questions is exactly what you just said -- what are the types of regulations that we should be considering, if any, that would address the interim storage of waste that's associated with reprocessing, whether it's high-level waste or low-level waste.

MR. CAMERON: Okay. All right.

MS. BAILEY: Not to get into the policy

decision of what we ultimately do.

MR. CAMERON: Yeah. I don't think that we wanted to get into those policy decisions. But I think that the way I understood your first comment -- and I think the way Beatrice might have understood it -- is that the NRC shouldn't be worried about what the regulatory framework is for the interim storage. And I -- that's not what you said.

MR. MCCULLUM: Yeah. My position and Beatrice's position and Marissa's position are all three -- we're in violent agreement on that.

MR. CAMERON: Okay. Well, I'm not going to argue with that. And, Jim, you know, these questions -- when you -- I just want to before you start -- is that I hope that it's clear. We have these bullet questions, and sometimes they drive us in ways that we shouldn't be driven. And I worry about that with some of these questions.

So that as you're talking about this, if you could provide any reference about how that ties into these that might be helpful to all of us -- or whether they don't tie it.

Because this is the discussion that's important. And I don't want us to go places where it doesn't make sense to go just because of the bullets

up there. Okay?

MR. LIEBERMAN: Okay. Well, a number of items to discuss here. First, with Beatrice's point about issues other than high-level waste, I think we were all aware of the issues of West Valley and the issues of the various DOE facilities in that complex -- of cleaning up the facilities.

Since West Valley was licensed the NRC has issued a regulation -- 20.1406 I believe is the regulation -- that requires as part of the licensing process to consider decommissioning.

So in our proposal -- and I'm sure NRC would require it even if it wasn't in the proposal -- as part of the application to get a license to build a facility you have to include how you're going to decommission the facility. So at the very front end you're thinking about the ease of decommissioning -- or how to facilitate decommissioning as you design the facility initially. So that's a major difference from the way facilities were designed and licensed in the past. So that's one thing that we've built in here.

To pick up item 1, the alternatives -- the NEI proposal for NRC consideration provides for several options. An applicant could come in and seek their license -- just a recycling facility --

processing facility for the separation. Or they can include as a part of that application fuel fabrication, fuel storage -- various other things that would be associated with a recycling facility.

If that was the case you could do it all under what we call proposed 7X because we've taken in developing 7X the regulations for Part 72 that addresses storage and the other provisions in the regulations. Or you could come in and seek a separate license to license the storage facility separately under Part 72 -- license the fabrication facility separately under Part 70 and do each portion of the facility as a separate license.

So I would think that is important to have the regulatory framework allow for the flexibility to include all these separate items into one licensing situation so you can consider all the interactions for the different facilities on each other to make sure you have a good safety understanding of the facility.

The second one -- well, let me answer a question about Appendix F. Appendix F has a five-year provision for converting the liquid waste to solidify or [indiscernible] the waste. That regulation's never been applied because that was not applicable to West Valley.

Our proposal adopts that five-year period to provide for solidification within five years and then placing it into a container that meets the requirements of Part 71 so it's ready to be shipped off site. I think any entity building a reprocessing facility would desire the high-level waste to be removed as soon as feasible from the site. There's no desire to store it any longer than necessary. Obviously that gets into policy issues of where you're going to put it.

So the canister to contain the solidified high-level waste has to be sufficient to store it for as longest time as considered reasonable for whenever we're going to have a geologic disposal.

I think the next issue really is what is high-level waste and what is this waste incidental to reprocessing. And Mike said that unlike DOE we don't have regulations or statutes. Even in DOE the law provides for a definition of waste incidental to reprocessing only for Savannah River in Idaho. For Hanford there's not statutory basis for waste incidental to reprocessing, and they're using a DOE Order 435.1.

At West Valley, which is under NRC jurisdiction, NRC issued a policy statement back in I

think 2002 that provides a standard for waste incidental to reprocessing.

All these standards are kind of consistent. And what they do is they look at high-level waste. The definition of high-level waste in the Nuclear Waste Policy Act is a highly radioactive material from reprocessing and a whole lot of other stuff.

But the issue is what is a highly radioactive material? The highly radioactive material in our view -- and what NRC has taken the view in the past and DOE has taken the view in the past -- is not the material -- let me say again -- high-level waste -- or highly radioactive is that waste that needs a permanent isolation. So what is not highly radioactive is that material that can be disposed of in near-surface disposal.

Now, what is that can be disposed of in near-surface disposal? That is the material that if disposed of in near-surface disposal can meet the performance objectives of Part 61. So it meets the standards of low-level waste. And you determine that by doing a site specific performance assessment for the particular site.

Now, there are issues in Part 61 that Mike

referred to that NRC's looking at -- and one of the issues is the classification scheme. The classification scheme has some weaknesses because the waste streams that were considered when Part 61 was adopted in 1982 or that time frame are different from the waste streams that we're seeing today.

The classification scheme of Part 61 was based on generic site and they applied the performance objectives to that generic site to come up with the concentrations for the classification.

I think -- I guess I'm speaking more for myself, but I think [indiscernible] 7X too is that the classification scheme is almost irrelevant. What's really important is the site specific performance assessment for the given site and whether it meets the performance objectives of Part 61. If you do then you have safe disposal. If you don't then it's not acceptable.

Okay. So what we propose is you look at the waste streams, and if the waste streams can either meet the current definition of Class C or below it would be low-level waste. Or if it can't meet the definition of Class C then you have to do a site specific performance assessment to demonstrate that you meet the performance objectives.

And in that way you're assured that the waste can be properly treated as low-level waste and it's protected. And that's consistent with the statute Congress passed for Savannah River in Idaho and it's consistent with the NRC policy statement for West Valley and it's consistent what DOE's doing in their order.

In fact, DOE is re-looking at their order. In fact, next week I'm going to a meeting with DOE and trying to marry NRC's practices and their practices and trying to come up with a federal standard for what is waste incidental to reprocessing. And then that can be considered by NRC as they go through the framework.

I don't know if I've covered the issues or the questions.

MR. CAMERON: Well, and I didn't want to necessarily drive you into those bullets if that wasn't the right way for you to explain what the -- what regulatory scheme you propose for -- or any I proposed that's in 7X for the management of waste from reprocessing.

I think that we've gotten an idea from you. I think you answered Don's question about does the industry have any thoughts on this. And I guess

the question is what the people think about some of the things that Jim has talked about, and does the NRC think that the 7X proposal, for example, touches all the bases that need to be touched -- perhaps not in the correct way, but are they dealing with all the issues that the NRC thinks needs to be dealt with in this reprocessing rule.

And I think that's what we need to discuss. Let's see what Anne has to say and then Don. And then, Mike, let's go to you and get your reaction to what Jim has said and let's see if we can build from that. Anne?

MS. CLARK: Well, at the risk of sounding very ignorant I will give my impression of what is being discussed. And -- well, first of all, from my perspective it appears to me that all waste, regardless of the method of generation -- and that's with the caveat that [indiscernible] has special rules. But that aside, regardless of the method of generation should be classified and regulated in the same manner. Why does it matter if it comes from a reprocessing plant versus a nuclear power plant if it meets the same content criteria basically?

And it sounds to me like that the issue at hand is more about how do you deal with the waste

while it's on site. And I'm guessing -- and correct me if I'm wrong -- that that is because on site situations are going to be different in nuclear power plants than they are going to be in reprocessing plants, and so you'll have different co-risks coinciding with the risk of having the -- that's redundant. You have different risks coinciding with the risks that are created by the waste management and waste storage issues. Is that correct?

And I have one last question. So these are sort of more questions than anything. And that is it baffles my mind why in the U.S. we classify waste -- radioactive waste the way we do. And it seems to be mostly based on our history of weapons creation.

And, yet, in Europe they have low-level, medium-level, and high-level waste and they give it a nice -- you know, an easy to understand definition for those of us who are not technical people. And so early in this day -- or yesterday actually we were talking about technology neutral regulation, and that appears to me the way to have a technology neutral regulation in this particular context.

The way we classify waste right now by saying that low-level waste is everything that's not one of these other categories is absurd because that

is totally not technology neutral. As soon as we come up with a new waste issue that is as dangerous as high-level waste but it's never been classified as high-level waste so it's not high-level waste it automatically goes into low-level waste by the current system. This does not make sense.

MR. CAMERON: I think you're raising good points. And I want to go to Jim to talk to all three of those points because I saw you nodding affirmatively on all waste should be treated the same, the second one we're basically talking about on site, and then the absurdity I'll use -- and you can use that word if you want.

MR. LIEBERMAN: Well, I was going to say, Anne, you're preaching to the [indiscernible]. The -- we have a crazy quilt regulation in the United States that's based on the statutes.

These statutes were written in different times by different Congresses and they don't play together. In fact, the 1980 Low-Level Waste Policy Act has one definition of low-level waste, and the 1985 amendment has a different definition of low-level waste, and Part 61, which is the NRC regulation for low-level waste, has the 1980 definition, not the 1985 definition.

I can give you two beakers of Cs-137 -- exactly the same concentration, same material -- and one beaker is high-level waste and one beaker is low-level waste because the way it was formulated -- the source.

So there's a real problem here. And what we're trying to do with these definitions of waste incidental to reprocessing is to try to put it on a risk based system to bring it into a common standard of these performance objectives of Part 61 and try to make sense out of a difficult system that we're faced with from a legal point of view.

There was a lawsuit that DOE was involved with in I think like 2004 time frame and Congress had to get involved. It just is a truly regulatory mess.

As to the question about reactors versus reprocessing, the waste forms are different. And one of the issues with reprocessing over the years is DOE stored the liquid waste in these tanks for a long time past the design life and they had to replace the tanks.

And a big benefit of this Appendix F is to require the liquid waste to be solidified in a relatively short time period so you don't have the residues being built up in the tanks and all the

problems associated with the current DOE conflicts.

MS. CLARK: So from -- it really isn't about how the waste was generated. It's more what form the waste takes after it's generated. So it seems to me that the regulations -- you know, what form is it take -- not after it's -- as it's being generated -- how does it become whatever it is, whether it's liquid or solid basically. Those are the two big distinctions.

So it seems to me that regulations could be based on the characteristics of the waste as opposed to whether they were waste generated in reprocessing or waste generated in nuclear power plants.

MR. CAMERON: And, Jim, comment on that before we go on.

MR. LIEBERMAN: That's where we want to get to. But the problem is the statute has a specific definition of high-level waste that puts the source into it and not the risk. Now, accessible approach would be disposing the waste based on its risks and hazards.

MR. CAMERON: Okay. Mike, let me -- I wanted you to react, and also Wendy and others, to things that are being said around the table. And I

wanted to get that on before you talk. But why don't you -- you had an issue for a while, so just go ahead. And you've got to do the button.

MR. LEE: I can't find fault in Jim's analysis of the history. Let me stipulate that as always. But, nevertheless, the regulatory -- the definitions have evolved over time with and without Congressional involvement. It's -- on face value it's not a very simple problem to try to address. The system is what it is. There are a number of constituency groups that are caught up in a particular definition. So when you begin to do some -- or if you were to attempt to do some fine tuning here and there might be some institutional resistance.

The one point that I was -- I wanted to make in rebuttal to Jim's thoughtful remarks is that what the staff is attempting to do as part of this rulemaking effort is to think proactively on the types of ways to manage these wastes rather than going back and retroactively examining what could be done to fix a problem that wasn't contemplated.

The DOE Policy Act -- all these things are after the fact. The DOE Order 435.1 is only about ten or eleven years old if I'm not mistaken. These -- the Hanford tanks go back to World War II.

So what -- as kind of a segue into what Rod mentioned earlier what we're trying to do is think ahead intelligently on ways -- and to pick up on one of Jim's points is to consistent with the Commission's 1995 PRA policy statement think of effective and efficient ways of managing these materials before the fact rather than after the fact.

MR. CAMERON: Okay. And, Don, then we'll go to Rex.

MR. HANCOCK: So I guess I just want to clarify to see if I correctly heard a couple of things that Jim said. You -- the NEI proposal -- or what you're proposal would -- could include -- would allow for what otherwise would be multiple licenses in the reprocessing facility license -- in other words, in addition to a reprocessing license what otherwise would be required for waste storage and different kinds, et cetera. So rather than having multiple licenses for the same site facility you would -- my word -- you would create a mega-license that included multiple factors. Is that correct?

MR. LIEBERMAN: Correct. That's an option.

MR. HANCOCK: Okay. And it would seem to be that -- I mean, we get -- we may get back into our

one step versus two step licensing problem here, but conceptually I think that's exactly correct.

And part of what I was intending in my earlier comment is by having too many things at some reactor licensing not included in the license to me that's created problems. And so I wouldn't want to see that happening with a reprocessing facility.

I guess I am -- I do want to -- I was going to say the same thing you said and -- about weir because it was a -- my view at the time was it was a bad decision by Congress at the time to, you know, do it to apply to two sites and not to others. That made no sense, but it was a political compromise decision that Congress made.

I guess I don't really understand why adopting a new version of weir for a reprocessing facility gets you any place. If we're waiting -- if we would be waiting -- which my understanding is the industry doesn't want to do -- if we were waiting for this reclassification -- revision of reclassification to go through and then say, okay, what does that -- what are the kinds of waste that would come out of the reprocessing under the revised classifications -- that would be one thing.

But it seems to me that where we have

classifications -- and as Mike's presentation showed -- for much of the waste coming out of a default PUREX processing plant we already have classifications for them. And there are -- there is a regulatory framework already in place, so why do we need another regulatory framework when we have one.

But I guess I'm particularly interested in from a weir -- why weir is the correct way or if you have a different concept in terms of the overall reclassification that you'd be looking for.

MR. CAMERON: And, Jim, could we not lose -- this is important for you to have this discussion on this because I think this could clear some things up. But could I get Rex on before we do that? Rex, your point.

MR. STRONG: Yes, thank you. I'm [indiscernible] slightly interrupt the nice bit of flow. But just to go back to waste categorization and then ongoing management.

I think there are some differences in categorization between one country in Europe and the next, so I'm not going to try to represent the whole Europe. But certainly as far as the U.K. is concerned we have three categories.

We have a low-level waste category, which

is defined as waste which are compatible with disposal criteria for a near-surface disposal facility, which itself has to meet pre-determined performance criteria. So that's much like yours.

We also have a high-level waste category. And that's actually different from yours. We will define high-level waste as those which are sufficiently radioactive to be self-heating where the self-heating characteristics then becomes an important point for operational management. And at the time that definition was created the focus was on operational management and was not on issues to do with long-term disposal. That consideration came much later.

So we have at the bottom end of the scale one definition. At the top end we have a different one. And everything else fits in the middle and that's called intermediate-level waste. And our definitions are, as you would have gathered, dependent on the characteristics of the waste and not of the technology which generated the waste. So that's that point.

Just moving on now to how reprocessing wastes are managed operationally. And that is that probably 15 years or thereabouts there's basically

been a policy position which says that waste arising from reprocessing shall be treated or processed as they arise.

So if that's materials which ultimately are to be stored, say, because they're intermediate-level waste then they shall be processed in whatever way has been kind of predetermined such that those wastes can be kept in what we would describe is a [indiscernible] safe solid form.

And the context for that is about 20 years ago the U.K. decided -- wanted a deep geological facility. And operational wastes ultimately destined for that facility were produced to a specification that at least in principle would allow that disposal. So logically consistent so far, and about ten years ago that policy position collapsed and we're not in the position where in effect that policy's been reinvented.

So now the U.K.'s clear it wants deep geological disposal following a protracted period of above-ground interim safe, secure, environmental responsible storage. And that protracted period could be 100 years or thereabouts. We have already got waste which has been in store for getting on for 30 years, so 100 years is not out of the way.

MR. CAMERON: Okay. Thank you, Rex. That's the model in the U.K. and sort of resonates with what Anne was saying. And now back to Don and Jim.

MR. LIEBERMAN: Okay. We are not interested in developing a new classification scheme. So to the extent waste is able to be classified under the existing Part 61 scheme then we would do that.

The issue with Part 61 is the existing scheme -- existing classification system sufficient. And that's what NRC is looking at. And, in fact, today was the time I heard of Part -- that consideration for re-looking at Part 61 of putting weir into Part 61. That's an interesting idea.

It's important to have a definition for weir in a regulatory basis because there's a legal cloud over the whole concept of weir. I mentioned that court case. Some people don't interpret the definition of high-level waste as I described it as NRC and DOE has been interpreting it since 1969.

And until we get resolution on this either through Congress or through the courts there's going to be this cloud over it. And someone who's going to be investing in a reprocessing facility that's going to create these waste streams need to know in advance

how their waste will need to be treated.

So we need clarity over these definitions. And whether you put it in Part -- in the reprocessing regulation or you put it in Part 61 or wherever it gets in the regulation that could be challenged by the courts and resolved so we know whether this concept which has been for, you know, almost 40 years is a valid concept will be helpful for everybody.

MR. CAMERON: When you talk about this concept what are you referring to?

MR. LIEBERMAN: The weir concept.

MR. CAMERON: The weir concept.

MR. LIEBERMAN: Whether there's a portion that came from a source from a reprocessing facility -- can some of that not be treated as high-level waste based on the risk and characteristics of the waste.

MR. CAMERON: So, in other words, it would be treated according to the performance objectives of Part 61.

MR. LIEBERMAN: Yes.

MR. CAMERON: Okay. Rod?

MR. MCCULLUM: Yeah. I think for the record it ought to be noted that Jim just answered the question in bullet number 4 yes.

But I wanted to get back to Don's

question, which was what does this get you. And I think this goes into -- I think this is a classic -- maybe one of the best examples we have of why it is important to have the regulatory framework in place early before you start to have applicants coming forward and designing facilities and applying for licenses and policy decisions being made around that.

Because if you have in place a logical, consistent, comprehensive framework for classifying these wastes -- and by consistent I mean consistent with how we would deal with the exact same amount of [indiscernible] from some other activity. You then have the ability to evaluate your technology to really look at what the costs and trade-offs would be.

You can perhaps tailor your technology knowing that that regulatory framework is sound, and I would hope you would tailor it to be as safe as possible -- as, you know, resistant to the types of contamination problems that perhaps we've heard about before.

So having this in place in a regulatory framework will, in fact, inform, whether it's Sven and his privately-financed reprocessing facility or whether it's Dan and, you know, his two step developmental facility -- but whatever it is we need

that kind of certainty before we can -- you really can't go forward with that sort of uncertainty out there. And I think NRC is on a path to resolve that and would encourage that path to continue to be followed.

MR. CAMERON: Okay. Thanks, Rod, for tying us back into that. Let's hear from the NRC and then go to Beatrice and Don. Let's hear from Phil and then we'll go over to Tom -- Tom Hiltz. Phil?

MR. REED: Okay. Let me weigh in with my thoughts on a couple of points that were made. This term origin based is unfortunately something that has been in the regulations and in the legislation. It is the basis for the high-level waste. It's not based on any type of analysis.

But that doesn't mean that that is not correct. It means it does serve a useful purpose particularly with the highly radioactive material. Certainly the definition of high-level waste can be modified or expanded to make things a little bit more clear.

With regard to this weir I think that Jim expressed it very well. Certainly it is a historical concept. It's sort of like a disconnect from today. That language needs to be cleared up because clearly

if we had a reprocessing operating today and it generates waste that would meet the requirements of Part 61 chances are it probably would go to either Barnwell or the low-level waste site out at [indiscernible].

But something has to be done to take care of this language. It's not an impairment I don't think to the actual operation. The Part 61 requirements, remember, were derived from intruder base. They are based on 500 milligram. We are actually now thinking of going more to a performance base, but that is still being talked about -- being proposed. It's not yet a fact.

The real big issue that we run into in low-level waste is if reprocessing generates radionucleids and those radionucleids are not listed in tables 1 and 2 of Part 61 then for all practical purposes they become Class A and then you can dispose of an infinity number of curies.

And I think the two examples that were presented was krypton 85, which is not listed in. And [indiscernible] is an exception. It's only related to Class B and C.

But those are the things that really worry people. And we have a fairly good idea of what waste

will be presented, at least from some of the proprietary information that is available from some of the commercial facilities. The staff at this point just has not had time to go through and sort that out, but we certainly plan to do that.

Both AREVA and some other people have made some -- some other companies have made presentations -- Nuclear Waste Technical Review Board, National Academy of Sciences, BRC -- in which they have actually laid out in principle what their low-level would be and what their high-level waste would be.

So I guess the message is, yes, we need to clear up this language. But I don't think it's going to prevent an actual reprocessing plant from disposing of waste under Part 61. And the other issue is, of course, the classifications.

MR. CAMERON: Thanks, Phil. And I guess that prompts a question in my mind after Tom is done -- is -- does anyone disagree that should waste incidental to reprocessing be implemented for a commercial fuel reprocessing production facility. Tom?

MR. HILTZ: I'll sort of start out with perhaps a bit of a confession, and that is that whenever I start to try to understand the waste

management issues and try to understand I get a sharp pain in my head. I get this ice cream headache. Because it's very difficult for me to sort of wrap my head around what the issues are we're trying to solve.

Seems like a lot of the discussions are steeped in, you know, regulatory history. We have legislation that prohibits us from doing this. We have -- DOE does it one way -- we may not want to do it that way.

But it seems to me that we haven't really established clarity in defining what we need to do in order to revise the framework for reprocessing. And we have two high priority gaps that are related to waste I think that we are hopefully focusing on.

But two things pop up to me. Number one is that there seems to be a creep in that we may try to solve other waste-related problems in the context of reprocessing. I can't say that with certainty because I've already admitted that I haven't been able to wrap my head completely around this.

But the second one I'm pretty sure is that I don't know what the success path is. And I keep hearing the discussions, and I don't know what the success path is or what the options are that we need to be considering for the reprocessing regulatory

framework. So if someone has some succinct clarity about that I would certainly appreciate that. Thanks.

MR. CAMERON: You know, I guess that trying to facilitate this session I've had the same sharp pain in my head. To find out where we are on this. And Mike's slide 13 and then there was a slide 14 that had gaps and options on this.

I guess my way of trying to get some traction on it was to find out whether there was a disagreement on whether the weir concept should be implemented for a commercial reprocessing facility, which, unless I'm wrong, it seems like that is what 7X is recommending. And that would be a pretty -- if people agreed with that -- I mean, that would be a pretty point. Jim?

MR. LIEBERMAN: Right. If NRC adopted the concept that's proposed in 7X or, you know, essentially the same type of idea I think that will solve industry's concern to provide a path forward in the design process from a waste stream point of view.

MR. CAMERON: Okay. And [indiscernible] my solution to this -- to get rid of the headache -- is to try to find one little life vest to grab onto such as this to maybe -- and then start building it. And perhaps Don and Beatrice, in addition to what they

were going to say, might give us a -- their view on that particular issue. Don?

MR. HANCOCK: So if the issue is weir for commercial reprocessing facilities -- is that the question you want me to answer?

MR. CAMERON: That's -- yeah, that's it.

MR. HANCOCK: Well, I guess my answer is maybe as opposed to certainly because the -- I am not satisfied with the Savannah River Idaho weir. So if that's what we're talking about I would have major problems with that.

If we're talking about NRC developing a -- which my reading -- and somebody can correct me -- my reading of the Gap 3 analysis that NRC is they're not saying that what you would adopt is a Savannah River Idaho weir, but rather you would look at the various residues -- hardware, [indiscernible], et cetera, to determine, you know, how they should be classified.

And if that's -- if what I just said is what you're thinking about the answer to that is probably that's okay. But if you're talking about the former -- the Savannah River Idaho -- yes, there would be a lot of concern about that. So to --

MR. CAMERON: Okay.

MR. HANCOCK: For me to give you any more

answer than I just gave, if Mike or somebody wants to clarify what NRC actually is proposing with Gap 3 or whatever else would be helpful.

MR. CAMERON: Let's stop there and go to Mike. And I don't want to get off on other points because I'd like to see where we are on this -- go to Mike for this and then I want to -- yes. Okay.

MR. LEE: The short version is there is an existing arrangement, if you will, in regulatory space on how to place certain waste streams. An option could be to work within that existing framework.

The wrinkle, if you will, is that when you look at Part 61 the Part 61 bucket, if you will, is based on assumptions that are decades old regarding the waste streams that are out there. So for any reprocessing technology that comes along that the Commission could potentially regulate there may be radionucleids that weren't considered in the earlier NEPA analysis.

As Jim as pointed out there's a -- and as I mentioned or alluded to earlier, one of the tasks independent of the reprocessing effort is to go back to the Commission with ideas on how we might modernize Part 61 to reflect yet to be defined waste stream or radionucleids to perhaps better embrace a risk

informed performance based approach to regulation. So we're kind of working on two paths in parallel.

MR. CAMERON: So -- and just to make sure that we're all on the same page here is that your answer to Don is in terms of this establishing weir in the context of commercial facility. It's not the DOE weir approach. It's going to be a different approach.

MR. LEE: I don't believe it's envisioned that we're looking at permitting the disposal in situ of weir-like waste from a commercial facility. I think it's envisioned that the desires to make sure that we have a -- that the technology, if you will, is kind of self-contained, that whatever wastes are produced there is a disposition path, vis a vis a geologic repository or some kind of other disposal system, if you will, not unlike intermediate depth or a shallow depth disposal facility consistent with the hazard posed by the waste.

MR. CAMERON: Okay. I'm hoping we're still answering the same question. But I know Don had something else and Beatrice and Rod. Jim -- Phil, did you have something on this weir business or --

MR. REED: [indiscernible].

MR. CAMERON: Okay. Well, we'll hold there. But let me check in with Don and Beatrice and

then go over to Rod and then to Jim. Don, do you have another point that you want to make at this time?

MR. HANCOCK: Not on weir but on the issue, yes. So if you still want us to talk about weir I don't have any more to say.

MR. CAMERON: Okay. Maybe we'll try to close. And I don't know, Rod, if you're on weir or something else either, but --

MR. MCCULLUM: Yeah, I'm just trying to answer Tom's question.

MR. CAMERON: Okay. Let's -- Beatrice, what did you have? Weir or not weir.

MS. BRAILSFORD: Well, I'll go ahead and do my weir rant. And then I do -- we can change the subject.

MR. CAMERON: We have a weir rant?

MS. BRAILSFORD: We have a weir rant.

MR. CAMERON: Okay.

MS. BRAILSFORD: I'm very glad to hear that NRC is not going to take the Idaho Savannah River model of weir. And to kind of put that political decision on any kind of level with the real honest to God regulation was kind of driving me crazy. So thank you.

MR. CAMERON: That was not much of a rant.

Okay. Not that everybody's disappointed. That was good. Thank you. Thank you, Beatrice. Should I go to Jim or you?

MR. MCCULLUM: I'll try to be quick. Because Tom asked what's the success path here. And we've been talking all around it, and weir is involved in this as well too. I mean, maybe I oversimplify things, and for some strange reason this never gives me a headache. I enjoy thinking about this sort of thing.

But the success path to me is to provide for the safe storage and disposal of all of these wastes while at the same -- and this last part's important -- while at the same time minimizing the burden on geologic disposal. Because, remember, there are only two reasons you reprocess or recycle. And one is to provide more energy and two is to simplify the waste stream -- to reduce the burden of geologic disposal.

And we are just emerging in this country from a world in which geologic disposal was everything, including some things that maybe didn't need to be. But it was definitely everything. Now we're looking more like the British in terms of long-term storage and so on and so forth.

So, to me, that's the success path -- is do we have a regulatory framework that provides a clear, consistent, sensible disposal path for all these materials while at the same time reducing the burden on geologic disposal.

MR. CAMERON: Okay. Thank you, Rod. And now let's go to Jim and then over to Phil. Jim?

MR. LIEBERMAN: I was just going to respond to Don and Beatrice. From an industry point of view we have no intent to dispose of waste on site -- weir on site like Savannah River in Idaho in the tanks. It's -- doing this weir process for -- the ability to determine what wastes can go to a low-level waste site or to a commercial disposal site versus having to go to a geologic site.

MR. CAMERON: Okay. And Phil?

MS. BRAILSFORD: I'll just note that Idaho's weir -- Idaho thinks it's going to send it to WIPP.

MR. LIEBERMAN: Well, WIPP is at issue with defense waste. The commercial waste doesn't have that option.

MR. CAMERON: Okay. And Phil?

MR. REED: I was going to respond also by saying that the weir that we're thinking of for

commercial reprocessing plants has nothing to do with the DOE type work related to Savannah River or Idaho.

However, unfortunately, that terminology has been carried over because it was associated, quote, with the word reprocessing, unquote, and now we have to deal with it in terms of a situation I believe for which it was never intended.

So, anyway, I'd like to address the last bullet that Mike had on the slides there. Yesterday we talked about a number of regulations that were published back in the seventies that related to reprocessing but have since been withdrawn but are available for us to bring back if we need to.

That Appendix D is the original Appendix F but now appears in Part 50, except one important part has been removed. And that important part was low-level waste. That actual regulation actually had some definitions -- or some criteria related to what we know as low-level waste today.

And it also indicated that that low-level waste would be disposed of at that time, which was Part 20 Section I think 120 or 320 which today is the precursor of Part 61.

At the same time, a couple from when this regulation was withdrawn, we had an application for a

commercial reprocessing plant down at Barnwell. The low-level waste -- at that time it was called low-level waste -- it wasn't referred to as, quote, weir, unquote. That low-level waste was designated to be disposed of according to Part 20.102 I believe -- or whatever the number was -- which today is the -- is known as Part 61.

So if that plant had been operating today that waste that had been generated would have been disposed of quite conveniently in either Savannah River or Hanford.

So it looks like it boils down to, is this language of weir has to be legalized in some manner. Somebody has to write some nice phrases in there so that we get back on track of indicating that if we generate a lot of volume of waste from a reprocessing plant that has [indiscernible] of radionucleids, and if those activities are sufficient to meet Part 61 they should be able to go into a low-level waste disposal facility.

MR. CAMERON: Thank you. Thank you very much, Phil, for that history on that and the bottom line. And let's go to Marissa and then we're going to go to Don for his other comment. And then I think we'll see what the audience has to say.

MS. BAILEY: Okay. As a [indiscernible] I guess I would like to just get some reaction to the fifth bullet behind me for addressing this issue. Yes, address --

MR. CAMERON: Address --

MS. BAILEY -- which is to address this issue, not in this rulemaking but in the rulemaking for Part 61.

MR. CAMERON: And when you say this issue, if we said you're going to address it through the rulemaking of Part 61 would that -- this include all of these aspects of weir, et cetera, et cetera? Would that take care of the whole business or would it just take care of the elements that aren't in the table for low-level waste now -- krypton and whatever.

MS. BAILEY: Well, I mean --

MALE VOICE: [indiscernible].

MS. BAILEY: That's low-level waste and [indiscernible] -- and so are we better off -- and to address this as part of the bigger picture leading to the [indiscernible].

MR. CAMERON: Okay. And that would be important for you on this rulemaking because you would just say we're going to wait for it to be addressed there. And I think we need some input from everybody

on that in terms of timing, et cetera, et cetera. But if you did follow that fifth bullet route would that take care of all the issues that you need to take care of? Mike?

MR. LEE: I'll try to give you the two-minute drill. The fifth bullet is written in -- it's not intended to be code. The first -- I can read it --

MR. CAMERON: You did a great job.

MR. LEE: I can read it perfectly fine. What's wrong with you? The first item there is Staff Requirements Memorandum. [indiscernible] are papers that the staff puts together. It's the staff's way of communicating with the Commission. It's a very formal process.

And in that particular Commission paper the subject was the disposition of depleted uranium. And what happened is there was some discussion in that paper about what can DU, if I can call it that, be managed under a Part 61 type of disposal arrangement.

And the Commission's direction back to the staff was we need to introduce into Part 61 a more explicit performance assessment requirement. And that performance assessment which would be imposed on existing and future licensees would on an interim

basis address the issue of whether DU or any other radionucleid that wasn't evaluated under the NEPA -- earlier NEPA process would be suitable under situations or circumstances or designs, siting -- that whole collection of issues -- be appropriate for Part 61 disposal scenario, which I mentioned earlier was a near-surface type of an arrangement.

That rulemaking, a technical basis of which has been approved -- and there's a rulemaking effort now underway -- a draft rule will be available in approximately one year. What the staff is doing right now though is it received some direction recently from the Commission to include blended wastes in that rulemaking as part of any kind of performance assessment evaluation. So we're huddling right now on how to deal with blended waste as part of the DU or what might be generically called unique waste streams.

The other direction that we got from the Commission is independent of what you're doing right now on the performance assessment provision of Part 61 -- or introducing explicit performance assessment provision of Part 61, talk to us about what you might do in any idea world to amend Part 61.

And so in that paper, which is due to the Commission at the end of the year, which would likely

be available -- probably publicly available sometime thereafter -- the staff is laying out some options for the Commission to consider.

And it's -- for lack of a better word it's kind of an ala carte type of assessment of options. One option could be a limited rulemaking to focus solely on the 61.55 tables. Another -- there are other options out there. Larry Camper at a recent waste management summit spoke to those options that were under consideration.

So it's kind of -- it can run from a very simple tweaking of the rule, if you will, to a more complex, more detailed reevaluation of what should a new Part 61 look like based on 35 years of operational experience, based on international experience -- whole variety of things.

MR. CAMERON: So would -- it sounds like it's a -- not necessarily a simple answer to take Marissa's proposal -- and I don't mean that's what your proposal is. But would -- should -- would all of these issues that you're trying to deal with for the regulatory framework for waste management issues for reprocessing -- you're not going to be -- are you -- would you be able to address all of those issues in this 61 rulemaking?

MR. LEE: Our intention as part of this Commission paper going upstairs is to acknowledge that there are likely to be new and emerging waste streams such as waste streams that are coming out of reprocessing.

And we -- I can't speak for the Commission but we'll point out to them that this is an issue that they should consider in any direction back to us on how we should proceed. I think -- if I can quote Larry, I believe the plan is to talk to the public at a future date about these options subject to Commission approval.

So the short answer is we could certainly accommodate these -- you know, the radionucleids that would be coming out of a reprocessing waste stream if that's --

MR. CAMERON: And it would --

MR. LEE: -- [indiscernible] --

MR. CAMERON: It would address the -- it could address the weir issue [indiscernible]?

MR. LEE: Commercial incidental waste to reprocessing, yes.

MR. CAMERON: Okay.

MR. LEE: Not the DOE issued, but wastes --

MR. CAMERON: Right.

MR. LEE: -- that are not --

MR. CAMERON: Right.

MR. LEE: -- or similar to weir.

MR. CAMERON: I think we're all clear on the DOE issue. And I want to go to people that have their cards up. And we do have a guest in the audience. We need to get to the public. But I want to make sure -- Don, I don't want to lose your issue that you were going to bring up. You had an issue that you wanted to put on the table. And maybe I caused you to forget it by now.

MR. HANCOCK: No. It's hard for me to forget waste confidence.

MR. CAMERON: Okay.

MR. HANCOCK: I'm certainly willing to defer. I agree. I think we ought to comment -- we've run over a little bit already. I guess just to make the point -- not the first time that the point would be made -- is waste confidence is a very controversial issue.

And I guess my basic point is what I've tried to make a couple of times already, which is that I think any reprocessing facility needs to be licensed to handle all of its waste products for whatever the

necessary time period is as opposed to assuming that there will be some near-term solution to the problem that we've seen historically doesn't necessarily happen.

MR. CAMERON: Okay. Thank you. And let's go to Beatrice and then let's close out with Jim and Rod. Beatrice?

MS. BRAILSFORD: An unintended consequence of following Don is that I get to repeat part of what he says. But I guess this discussion has highlighted for me maybe a broader question than we want to talk about, but it may or may not happen on the ground.

It would seem to me that a reprocessing facility will require interim storage of spent fuel, then it will require reprocessing, then it will require perhaps a fuel fabrication plant and storage of fresh fuel. And because we want to solidify the waste from an aqueous reprocessor it would require both storage of some quantity of liquid high-level waste, it would require some way of solidifying that waste, which at this point is a vitrification plant, and then a storage facility for solidified high-level waste.

So back to Don's question -- and I certainly want to echo Don's question about the time

frame. Waste tends to get to certain political places and stop.

But back to Don's kind of question from a couple of hours ago I think, you know, that you have this mega-reprocessing license, and then underneath you have all these partial licenses, it looks to me like you're talking like five or ten separate licensed facilities, and some of them represent I would say high risk.

MR. CAMERON: I'm sorry --

MS. BRAILSFORD: Not high financial or regulatory risk, but they have to be regulated in a way that acknowledges their high environmental risk.

MR. CAMERON: Thank you. And, Jim, if you want to address what Beatrice has said, as well as what you were going to say, go ahead.

MR. LIEBERMAN: Well, I would just say yes to Beatrice. You have to consider all these interactions. I wanted to respond to Marissa on this fifth bullet. And I think it's premature because, as Mike says, in December the staff owes the Commission a paper on this comprehensive relook of Part 61.

As an individual I've written two letters the Commissioners on my view how to do this. I've met with each of the Commissioners. I'm very interested

in how this is done. And you can do this with a capital C comprehensive or a small C.

Capital C is you relook at the classification systems -- you come up with new concentrations. The small C is get rid of the classification scheme -- who cares about the classification scheme -- because the classification scheme is based on a generic site and there's no particular site will ever be the generic site.

But from a risk-informed point of view the solution is each waste site needs to develop its own waste acceptance criteria, and the waste acceptance criteria for that particular site is based on a site-specific performance assessment for that particular site rather than for the generic site demonstrating that this waste acceptance criteria for these particular isotopes concentrations quantities -- it will meet the performance objectives.

And you update that every few years. And I think if you do that you will assure that for that particular site you'll have a safe site. The Commission -- I mean, that may be one of the options the staff considers.

If you consider that option then weir wouldn't be part of that. If you consider it with a

more comprehensive approach then weir might be appropriate for it -- it might be considered.

But the only place weir would ever be an issue in an NRC regulatory space is in reprocessing. So one could say the best place to focus on weir is in reprocessing because a review -- or revision of Part 61 will be extremely controversial. The agreement states will be very interested in it. There's a lot of stakeholders with lots of different views and it's going to be very complicated. And why add weir to it? It just adds that much more complication.

So my vote -- NEI Task Force hasn't considered this issue, but my vote is that to keep it separate.

MR. CAMERON: And I notice that Tom's headache is getting worse I think. But, Rod?

MR. MCCULLUM: Yeah. Taking --

MR. CAMERON: And then we'll go to [indiscernible].

MR. MCCULLUM: Taking Jim's vote into consideration and awaiting the full task force deliberations I -- granted some things are premature. I could, however, give a conditional yes to Marissa's question.

If the success path that I described

earlier, giving all of these materials a clearly defined disposal path while minimizing the burden on geologic disposal, can be accomplished through a Part 61 rulemaking such that all you would have to do in a subsequent recycling rulemaking would be say See part 61, the answer would be yes.

So there's potential there. I look forward to exploring it with the rest of industry and the task force, and I would certainly look forward to the task force interacting with NRC, whoever the appropriate people are on the Part 61 side on that as well.

MR. CAMERON: And I guess that's going to grist for your mill too in terms of what you [indiscernible] back up with.

MR. LEE: Being intimately involved in the December Commission paper I have it on good authority that we'll be giving -- acknowledging the letters that Mr. Lieberman has written. So I can assure you that we're -- that's part of the mix. And we're going to ask the Commission to provide some direction. So, Jim, no more letters. I only have two more weeks to write this paper.

MR. CAMERON: And would you -- Mike, is it possible that you might put in this paper exactly what

Marissa suggested, and as amended by Rod, that here's a way to solve the -- address the waste management issues for reprocessing. Can you put that in there?

MR. LEE: Well, I think the economists would call this the free rider benefit. One of the challenges in considering a revision to Part 61 is trying to develop a regulation that's flexible and elastic to changing waste streams. And if -- just as a hypothetical if we were to write a radionucleid neutral regulation that focuses on the sub-part C performance objectives that's certainly one way to skin this cat.

MR. CAMERON: Okay.

MR. MCCULLUM: I like it. Radionucleid neutral.

MR. CAMERON: What's that?

MR. MCCULLUM: Radionucleid neutral -- I like that.

MR. CAMERON: You just like the word neutral. That old car you talked about is stuck in neutral somewhere I think.

MR. LEE: Not to be flip though we're trying to come up as part of the development of this paper with some realistic ways of addressing the issue and developing regulation that's focused on future

waste streams as well as the existing waste challenges.

MR. CAMERON: Okay. And thank you all. Marissa, final comment, and then we're going to go out to the audience and then take a break.

MS. BAILEY: Yeah. My final comment is really a response to Beatrice, and I think you make a very good point -- I agree with it. In fact, I think reprocessing forces you to take a look at the entire back end of the fuel cycle. And that's one of the things that we've done at the NRC.

And, you know, earlier this week I talked about the integrated spent fuel management plan. And, you know, we recognize that when you're looking at the entire back end of the fuel cycle, whether it's spent fuel storage, reprocessing, transportation, and ultimate disposal -- they're all connected and we need to be making sure that we are promulgating rules and regulations and guidance and policy that are -- that take into consideration the entire back end of the fuel cycle, and that we're not issuing rules and regulations and guidance that might conflict with those aspects of the fuel cycle.

So I agree with your comment, and I think we are looking into that as part of the integrated

spent fuel management program at the NRC.

MR. CAMERON: Okay. Thank you. Thank you, Marissa. This is the time when we go to the audience. And we're fortunate to have Representative Heaton with us, who's the chair of the Radioactive and Hazardous Materials Committee of the New Mexico legislation. I'll turn it over -- do you want to go here?

We were joking around about don't tell a politician that he has unlimited time and he's already taken the podium.

REPRESENTATIVE HEATON: I've already taken the podium.

MR. CAMERON: So we're in trouble.

REPRESENTATIVE HEATON: So get your cushions out. No, really, I want to first start out by thanking the NRC. I have appreciated through the years the realistic approaches that you try to take to regulation, as well as practical approaches that make things go forward and do things efficiently. So from that perspective I want to thank the NRC and what you do in that regard.

And I want to thank you for anticipating some of the issues associated with the back end of the fuel cycle as well as what's happening with the Blue

Ribbon Commission and what some of those potential outcomes may be. So I want to thank you for addressing those as well.

As far as the definitions go, in the legislative process, both in the state and at a national level, we've been fighting the definition issue for, you know, as long as I can remember -- the last 12 years at least. It is a significant problem, and I think that somehow you need to come up with some solution to it and -- you know, for instance, with WIPP it's 23 curies per liter, which is the -- you know, the amount. And it's definitive, you know what it is, and I think that somehow those kind of definitions need to be in place.

And then I agree with the idea of performance assessment associated with once you determine what the activity level is then getting to some performance assessment for the disposal process -- but to make sure that it does indeed fulfill the disposal interest that we're all concerned about. So I think that that's a huge issue and somehow needs to be addressed.

I apologize for not being here yesterday, but I'm in the heat of what's called a campaign and we had one of those interminable forums last night that

go on for hours and you debate back and forth about not the real issues but what somebody's accused the other of saying that is untrue.

It's a terrible situation in our political system that it's deteriorated to this state that we can't talk about the issues in a civil, kind way and the prospects of what we intend to do and how we're going to do it rather than what somebody else hasn't done and distort their record. So, anyway, that's -- I won't go into that -- I could speak for an hour about that.

But, anyway, as far as the interim storage issue, I think it is a critical thing to consider. I think that it has to be considered for a number of reasons, and I think that you should on the front end anticipate based on what the Blue Ribbon Commission dictates in terms of a storage medium where that interim storage facility should be.

I think moving the waste multiple times across the country creates a certain amount of risk and, you know, a huge cost. So I think that coming that some conclusion based on that and maybe what ultimately becomes the site -- I think the interim storage facility should be adjacent to it as I do think that the reprocessing facility should be

probably as well adjacent to that site.

But to talk about a couple of points, there are a number of facilities in the country that have been [indiscernible]. As you're aware, some 13 states have [indiscernible] facilities in those states and they would like to get the waste out of their states -- the cores out of their states and moved somewhere so they can indeed move to a green field in those particular sites.

There are also some reactor sites that I am told are getting low on space for storage -- not many, but there are some. And so there needs to be a place for them to move that waste.

Thirdly, I think that the issue of the fines and the lack of response since the -- since 1998 has put the federal government in a position of potentially owing 2, 3, 4, $20 billion to the industry for not meeting its obligations for having moved the waste off their site.

So I think that having an interim storage facility -- it moves the waste and puts it in the hands of DOE, which by regulation -- puts it in their hands and it gets it off the sites. It mitigates the lawsuit. And we're moving forward in the process.

And I think that this idea that there

should be a DOE site only should be changed. I think that that's not practical. I think that you'll see the industry in the private sector step up and make the decision that they are willing to do this. And I think that you will find cities around the country and states around the country that will be willing to do it. And I think it should be allowed to occur maybe under NRC regulation through the private sector. If that's the way it goes the DOE could put one in themselves -- and maybe there needs to be two or three of those.

The challenges that I see in interim storage are that we have to overcome the idea that has developed in the country to some degree -- and probably because of Idaho -- that there would never be answer to the movement of their waste.

And so I see that states probably are going to be reluctant to take interim waste unless there is some ironclad agreement that that waste gets removed from that state if -- in some period of time. And I'm not sure what that needs to be -- whether it's 50 years or 100 years or tied to the robustness of the container and the overpacks and what have you. It ought to be tied to something that's physical about the sustainability of the container I think.

But I would advise you not to be too short in that number because there will be a lot of give and take in the states about what that number needs to be and what is reasonable about the time frame. So I would suggest that you look at some number that you can defend based on the robustness of the container and the ability to store it over a long period of time if you will. I'm trying to give you what I think are some political issues associated with these things -- and maybe you've already discussed them.

Or -- and if they're not removed then for a state to step -- for a state to be willing to do these things I think it's going to require that there be a significant fine if it's not removed and that -- or the other process could be that you pay by the container. And at some period of time when you would have expected it to move to a repository or to get reprocessed or what's going to happen that the cost for that container being stored becomes higher and higher and higher till there's extreme motivation to get something off dead center.

And that's what it seems to take. We don't ever do anything in this country unless there seems to be a crisis. We move by crisis management and rather than doing things reasonably. So those are

-- and I think that those are some of the things about the interim storage I'd like to speak to.

About reprocessing or not to reprocess I guess is based on a number of issues. The finite uranium resources of the world I think makes one -- is one of those big decisions. I think that also the impact of the additional waste being generated, which we've just talked about, cost of reprocessing versus new fuel, and cost of managing the non-reprocessed fuel storage disposal -- all of those sorts of things -- the increase in the volume of waste that we've all talked about -- that there needs to be some cost analysis being done that is realistic and makes some sense about what direction I think that we actually go.

And, of course, there's the philosophical opinion in the country, and indeed the world, about our position on recycling. Recycling to me is the cornerstone of waste management, whether it's aluminum cans or reduced paper or spent fuel -- whatever it happens to be. Reducing the volume makes enormous amount of sense.

The French essentially, and others that are recycling, reduce the volume of waste by approximately two-thirds, and I think the numbers we

saw up there verify that. They recycle two times and the last cycle -- I guess you could recycle it again but you probably have to put 23 percent plutonium in there to get enough [indiscernible] material to make it active enough.

But, at any rate, the way that goes I think makes some sense in terms of waste reduction volumes. So I think that has -- is an important consideration.

And I think that the other big issue about recycling is that from a global perspective we talk about how we're going to manage the fuel in the rest of the world and what we're going to do about uranium enrichment in the rest of the world and how we're going to control that and how we as a country are going to supply fuel to the rest of the countries of the world or the European Union and others that have a coalition in the global interest of not -- of containing proliferation -- how we're going to do that.

And, yet, we as a country are expecting the Europeans or the Japanese to do the recycling and we sort of stand off to the side. I think that we have a moral obligation as a country to get engaged in the same activity that we would expect other countries

to be engaged in -- and that's recycling and then replacing that fuel for those other countries.

So that's a couple of comments. Retrievability of waste when it's being talked about is a huge issue. I think that the Blue Ribbon Commission is -- clearly has some lean toward salt at this point. And if you're going to put waste in a salt repository, salt moves -- it's very plastic. You know -- as you know, the National Academy recommended it in 1957 and have continued to recommend it since. And it makes a lot of sense.

But putting something in salt that's not retrievable -- or that you want to be retrieved gets to be a serious issue, even though it could be designed for at least 100 years for retrievability. So those are issues that I think need to be considered.

I'd like to make, if I could, just a couple of comments about WIPP and the WIPP process because I think that not only you but others are talking about how do we move into recycling, reprocessing -- how do we move into a permanent repository.

And I spoke to the disposal subcommittee of the Blue Ribbon Commission -- when was it, Don -- a

couple of months ago -- we spoke. And the process that we used in New Mexico is -- was extraordinarily lengthy, but it worked. It -- we actually started in the era of about 1975 -- ended up getting it open in 1999. So that's a long period of time -- 25 years, if you will -- to go through that whole process.

But what we ended up doing is that in -- the community itself in southeastern New Mexico became engaged in it and said let's see what the questions are, let's see what the problems are, let's learn about it. They were as naive about it as anybody you could find.

And they did engage in it, did learn about it, did become confident in it, and as a consequence took on the project. And it was because of DOE's efforts and education that made that happen.

And then subsequent to all of that, once they became accepting then the 1982 law was passed to allow the money to flow into the drilling the shaft and doing the experiments in the salt to confirm it. And then in I think 1991-92 time frame the Land Withdrawal Act was created to move the process forward at that time.

Prior to that high-level waste was a consideration for WIPP. And it was withdrawn out of

it -- out of the consideration and only transuranics were left in it. But there is a hot cell at WIPP designed for waste handling of high-level waste, and it was originally discussed form that point of view.

And so the thing opened. It's been open eleven years now without incident. It's been a tremendous, tremendous facility. And I think that something in that process needs to be looked at in terms of how indeed get a facility open and how we get reprocessing started in the country.

So I think that you would have to have today an agreement with the state in terms of the Governor of the state -- I think that's going to be a critical issue getting the community and the state, subsequently getting the Governor to sign an agreement. And that agreement, again, needs to be ironclad, and perhaps NRC needs to be the group that if there is a health and safety reason they would mediate that argument.

Because, otherwise, the state should not be able to back out. We can't continue to spend $14 billion every so often to try to look at a repository that is not going to be a fait accompli. I mean, it just not -- doesn't make sense for us to go through that process.

So those are a few of my comments. And I'd be happy to try to answer any questions that any of you may have. Thank you so much. Appreciate it, Chair.

MR. CAMERON: Thank you very much, Representative Heaton. And we're going to take a break now. But, Representative, are you going to available for discussion -- whatever?

So let's take a break and come back at -- let's come back at 25 till four. And then we're going to go to environmental with Miriam. And after that we'll have some closing remarks from all, including Lawrence Kokajko.

(Whereupon, a short recess was taken.)

MS. JUCKETT: While everyone is making their seats I'll very briefly introduce myself. My name is Miriam Juckett, and I work at the Center for Nuclear Waste Regulatory Analysis, which works with the NRC.

And Chip has been very kind to let me help facilitate the last couple of meetings and [indiscernible] and agreed to let me do one of the sessions in the afternoon, although I think I'm kind of getting the short end of the stick since I'm getting the shortest, last, last session where

everyone's tired and doesn't want to make any more comments. So keep up your spirits and let's have a good discussion on the last one.

This section on the reprocessing and recycling and environmental protection is going to focus, of course, on the environmental side of this. And I think where we want to steer the discussion is going to be on how the NRC should go about making a reprocessing rulemaking in regards to an environmental review.

And Wendy Reed is going to start us off with a kickoff presentation for this.

MS. REED: Thank you, Miriam. So, yeah, I'm going to talk to you about the things the NRC is doing right in the realm of environmental protection as it pertains to the reprocessing and recycling.

There's a couple of things that we're looking at right now. The first thing I'd like to draw your attention to is that staff -- specifically the FSME staff -- and I don't know the full acronym either -- yeah, no one does. Anyway, they're planning what is called an environmental topical report -- or an ETR, which I'll refer to in the future.

And that's an internal research project. And it's primarily to assist the regulatory basis

development. And also in the future it would be used as well to aid the decision making. If reprocessing went into rulemaking an EIS would probably be required because it would be major rulemaking. And so the ETR would help to inform that also.

But I just want to stress that an ETR is not an EIS. The ETR is an internal document. [indiscernible] that, there are plans that have been finalized by the NRC to make it public, but it's very separate from an EIS. And, as I said FSME is taking the lead for that.

The second is -- concentrates more on the -- what the working group is doing where main focus is really on effluent and emissions. There's a Gap 19, which is specifically focused on effluent control monitoring and also looking at other aspects of environmental protection, confinement, containment, the use of filters -- that kind of thing.

So I'll just give you a brief outline of what an environmental topical report could possibly contain. It could discuss the purpose and the need for the proposal for making action, give a brief technology history of recycling and reprocessing, description of a facility and the interactions it would have with the environment, and provide a

discussion of the construction, the operation, and the postulated accidents, and would also address decommissioning aspects too. And it will give a comparison between open and closed nuclear fuel cycles as it relates to the effect on the environment.

I'm just going to skim through the next slides because I think that everyone's pretty much familiar with the concept and closed cycle. So it's just a little flow chart giving you the open fuel cycle, the once through that is currently in practice in the United States -- no recycle -- all the spent nuclear fuel would be planned to sent to disposal.

Current spent nuclear fuel discharges range in 2,000 to 2,500 megatons of heavy metal annually, and we use -- possibly use the 2,500 tons per year as a basis.

And then the closed fuel cycle is shown here where you would actually reprocess the spent nuclear fuel and you would recycle and produce MOX fuel that would be sent to light [indiscernible] reactors. Your high-level waste would ultimately be sent to a repository right now. And, again, you use the same basis of through put -- oh, not throughput -- I'm sorry -- basis of spent fuel.

Now, as I said, an ETR could contain a

generic description of a reprocessing facility. And I think it's Beatrice who brought up the various aspects a nuclear fuel reprocessing and recycling plant could take on. And these would, of course, include a spent nuclear fuel receipt and storage area -- possibly like a spent fuel pool.

A facility that would dismantle the fuel -- it could actually possibly -- oxidation is mentioned here. That's -- I believe that was process developed by Oak Ridge National Laboratory to manage tritium -- to capture tritium by heating the fuel. And then you'd have a dissolution separation so you can divide up the [indiscernible] of the used fuel into the products that you want and to the waste.

On site you could have again the manufacture of the MOX fuel, et cetera, management of byproducts such as noble gas -- not noble gas -- noble metals. And then you have storage of products -- your fresh MOX fuel and certain byproducts. And then you'd have aspects relating to waste management, treatment and storage, possibly a vitrification plant, shipping, transportation capabilities, and then also your support facilities -- maintenance, chemical storage, recycling of solvents -- that kind of thing.

Now, the second part we -- this was kind

of discussed a lot in the Rockville meeting -- was about the 40 CFR 190 requirement, which is an EPA -- Environmental Protection Agency -- regulation. And the NRC regulates to this EPA limit via Part 20, and I think Appendix I, Part 50.

And there were two aspects to this regulation -- dose limits and quantitative limits. The dose limits are relatively low. They're based upon individual health impacts, and the details given that. Now, the two minor bullet just put it into context at how low they are. A check x-ray is about 10 [indiscernible], for example. And then if one was to move from Denver -- I'm sorry -- to Denver, yes, from Washington, D.C. and live there for 12 months you would probably get an increase in the background radiation of our 20 [indiscernible] per year.

And from the input we have from modern reprocessing facilities and feedback in meetings such as these levels seem to be comfortably met by reprocessing facilities today.

The second -- the quantitative one -- it seems to be more tricky to me. And this is actually based upon collective exposure of populations. And it's the collective dose, which is very small doses to very large populations, and it is a possibility that

this may overstate the impact.

So this gives you the -- some figure for the two parts of the regulation. Essentially all releases that are allowed in 40 CFR 190, if you like, would come from reprocessing operations.

The left table is the dose limits, which I mentioned before, and don't seem to be as much of an issue for reprocessing facilities. On the right side of the table it gives you the isotopes that are actually mentioned, and specifically in the regulation -- krypton 85, iodine 129, plutonium 239, and the other transuranic elements -- isotopes.

The limit in the regulation is 50,000 curies of [indiscernible], and then 5 millicuries for the iodine and .5 for the plutonium and the transuranics. And I think this is -- the potential emission, which is based on I think a burn of about 52,000 watts -- megawatt [indiscernible] per ton basis -- shows that the potential emissions from reprocessing would be considerably higher currently than the regulation would allow for.

This slide just gives you a little bit of background about the basis for the EPA regulation. As I mentioned before, it's based on the collective dose. And at the time the regulation was developed it was

developed using a postulated number of nuclear power plants that would produce 1,000 gigawatt of energy. And that's actually ten times the actual value that exists today.

It was also postulated on the existence of 1,500 megatons of [indiscernible] heavy metal [indiscernible] reprocessing plants in the United States. And the actual value today is zero.

In addition, it was based on relatively short cooling times before reprocessing took place, which is one to five years. And the current practice I believe in foreign reprocessing plants is four to five years.

It was also based on a landlocked site. And, again, if you look at where La Hague is, you look at [indiscernible], you look at Rokkasho -- they're all on the sea.

It's not mentioned here, but I would like to draw attention to a report that Sandia National Lab did about the basis -- the technical basis for the 40 CFR 190. I don't know if it's on the reprocessing website, but it's very -- a lot of very good background about the basis for the EPA regulation.

Okay. So I guess some things to think about -- as I mentioned emissions as they stand could

exceed the limits that's stipulated by the EPA. However, some emission control technologies could add potential hazards. And I mentioned briefly voloxidation. And what voloxidation involves is you take your spent fuel prior to dissolution and you heat it to very high temperatures in an atmosphere of oxygen.

And the trouble is obviously that spent nuclear fuel contains some materials that are pyrophoric that can catch fire. So then you're introducing that risk into the mix.

The second was the krypton capture. If you do capture your krypton because it is a gas you're likely going to have to store it in a compressed or cryogenic storage facility, and so then you have that risk too.

One of the things you can do to reduce the krypton and the tritium significantly is by reprocessing old fuel -- and we certainly have quite a lot of that in this country. If you reprocess fuel that was over 30 years old then you've reduced the krypton and the tritium content by about 90 percent because they have relatively short lives between 10 and 12 years each.

The downside of that is that you are going

to increase -- sorry -- you're going to decrease your fuel value because you're allowing some of the plutonium 241 to [indiscernible] to produce americium 241. And that has a half life of about 250 years, and so that would actually increase the burden on the waste management because you would have the -- the heat load would be increased.

And another thing is that the iodine limit was based upon many assumptions, one of which being the number of nuclear reprocessing facilities and the nuclear power plants exist, and that may not be as valid today.

So what the NRC would like to get a feel for is what kind of requirements do we need for environmental protection, what kind of technologies do we need for confinement/containment, use of filters -- HEPA filters -- that kind of thing. Should they be performance based? For example, should we set minimum decontamination factors? And how that ALARA, as low as reasonably achievable, fit into the mix?

And, finally, there's just some questions for discussion which actually -- which relate to the ETR which has been in proposal -- has been proposed and also through ALARA and other regulations that would pertain to environmental management. Thank you.

MS. JUCKETT: Thanks, Wendy. As Chip has done with the other presentations if any one has any comments or questions about what's been presented we can let Wendy go ahead and go -- I see Beatrice already has her card up. (Pause.) She needs a second. (Pause.) Does anyone else have anything in the meantime? Need a clarification? Go ahead.

MS. BRAILSFORD: Sorry. I just have a clarifying question, Wendy. On slide 8 did you say that these are the only isotopes covered by the regulation?

MS. REED: I believe that's the case. Those are the only ones if 40 CFR 190 that are mentioned specifically.

MS. BRAILSFORD: Okay. Thanks.

MS. JUCKETT: Jose, can we put it back on the other question slide? I notice that these are quite a bit different than what's in the agenda, so I'll go ahead and steer it back to where I thought we might want to go with this originally, which is what kinds of things the NRC might want to consider in their environmental review as far as the scope and the nature.

And, of course, it's -- there's a lot of different factors to be considered in this kind of

thing. So I'd be interested to hear from the NRC. Maybe Tom has a comment on what kinds of things you think might be important to start off with.

MR. HILTZ: Thanks, Miriam. I do want to reemphasize and make clear where we are in the environmental review process for a potential reprocessing [indiscernible]. I think just to build on Wendy's slide, right now there is no significant federal action in front of us so we haven't entered the NEPA process.

But I think we've looked at what's in front of us with regard to revising the framework, and we realize that the environmental piece and likely a full environmental impact statement will be needed to support any proposed rulemaking.

With that in mind we are preparing a sort of broad scope environmental technical report to help inform those aspects of the process that we can early on in the process. And then my understanding is that the results of that environmental topical report should we be directed to move to rulemaking will be used to inform the draft environmental statement, which will go through the normal environmental NEPA process for a scoping meeting and scoping period.

So I think at this point, at least in a

preliminary phase, we're interested in understanding, you know, what issues should be consider in that environmental report. How should we scope it? Should we limit it to just aqueous processing? Should we bound it some other way? Are there other insights about impacts?

Maybe folks are familiar with the environmental impact statement that was done for -- the programmatic environmental impact statement that was done for [indiscernible] -- if there's some insights from that we should particular pay attention to. So, with that -- I mean, hopefully that will help generate some discussion.

MS. JUCKETT: I think that's good. I think it's a good opportunity for all the stakeholders to be able to give their input for that. Rex [sic], go ahead.

MR. MCCULLUM: Yeah. I think the ETR is an excellent idea, and I'm glad to hear that NRC is publishing that. And you will be putting it out for comment. Correct?

MR. HILTZ: I don't think that decision has been made. Preliminarily I do not believe that we will put the ETR out for public comment. The results of the ETR will be rolled into the EIS which will be -

- the draft EIS, which will be available for public comment.

And I want to provide a distinction between of publicly available for comment and publicly available. So -- and your question was would it be publicly available for comment.

MR. MCCULLUM: Yeah. Available does at least allow that there will be chances for reactions to it and discussions to it. And the reason I think this is valuable is there's some probably some iteration that needs to happen from where we are now to before we get an EIS.

And I particularly -- as you might expect I'm interested in the subject of technology neutrality. That's going to be challenging. I mean, I could envision an EIS looking at multiple scenarios, both in terms of different processes, some of which will have more information about than others. And in terms of different levels of facility capacity you've got a thousand metric tons up there which would envelop most of the foreign facilities.

But the idea that you would put something out that would, to the best of NRC's ability, explore the limits of technology neutrality and maybe raise some of the issues where you don't think you have

enough information to do an EIS.

And let industry response to those, you know. Let us have the opportunity to say, no, we think there are some things you can do for this scenario or that scenario. And I'm looking with, you know, all three of the major vendors represented here having -- giving them the opportunity to react to that and, you know, again, to try to make their case for how you could do this in a technology neutral manner I think would be important.

MS. JUCKETT: Are there any comments about that from what Rod's asking for? (No response.) I know it's the afternoon. Go ahead, Wendy.

MS. REED: Yeah. I'd just like to follow on from what Tom said. The ETR will be made public once it has been finalized. It is primarily to help with the regulatory basis development.

MS. JUCKETT: Tom, can you give a kind of time line about when the ETR might become an EIS -- where that would fit in the process? You were mentioning that it might move to an EIS from an ETR.

MR. HILTZ: Well, it will help inform a draft environmental impact statement if we're directed to proceed with rulemaking. So my understanding is that there is no significant federal action associated

with this until we embark on -- are directed to embark on a rulemaking process.

MS. JUCKETT: Okay. Well, we can go ahead and move on to another one of the topics. I had asked Rex before the meeting if he would mind giving a little bit of international perspective that's mentioned on one of the bullets -- it was also on your agenda -- as far as what kinds of things are considered for the international practices that we might want to consider here.

MR. STRONG: Okay. I'll sort of dive into this. You can decide how much of it is relevant and what's not.

Let's think about discharge in the marine environment. We'll think northeast Atlantic just as a place to start. There is something called the OSPAR Convention to which I think it's fair to say all the countries which have a border with the North Sea in the east Atlantic [indiscernible] and one or two others such as Switzerland.

So this is an international convention. I'm not entirely sure it's got legal force, but it's certainly got moral and political force. And there's no doubt whatsoever that the parties to it wish to meet their international obligations. And these are

all about reducing discharge to [indiscernible] environment ultimately such that concentrations arising from manmade radioactive materials should basically be close to zero -- and, incidentally, by 2020.

Those contracting parties make a report to the OSPAR Commission on a frequency of about once every three years on their use of best available techniques for the purposes of minimizing discharges into the marine environment. And in this mix actually is an international obligation, which is to use best available techniques. So those reports are all out there. As far as I know they are publicly available, possibly via the OSPAR website, or, if not that, then the OSPAR Commission.

So just as a matter of fact for current nuclear technologies -- and I don't just mean reprocessing -- those contracting parties who are nation states have offered up their reports to demonstrate their compliance with their international obligations. So that material is out there and you can see what the different countries have done and the techniques that they have used.

And I stress techniques because that word includes both technology, but also the ways in which

that technology is used. And that takes us into management systems stuff, quality assurance, training of operators, and all that.

There will also be some information in there almost incidentally around techniques used to limit discharges into the atmosphere because of the potential for those atmospheric discharges to affect the marine environment. So atmospheric discharges may be affecting the marine environment. So a little bit incidental but, nevertheless, information that's out there.

I think perhaps the other thing that comes to mind around international practice really flows through the IAEA and the basic safety standards. So basic fundamental standards that states which members of the United Nations basically agree to use, as you were, for the purposes of their own internal self-regulation. And, of course, included within that set are things about not just the impact on workers, of course, but the impact on members of the public arising from discharges.

Now, within that model there is a presumption that if people are actually protected then so is the environment. Now, there is another point of view, of course, particularly in environments where

there aren't many people. There maybe another dimension to it. And the whole question of protecting flora and fauna per se is a topic which is a matter of live debate in the IAEA and elsewhere.

So I think what I'm trying to say, from the point of you just wanting to understand a bit more about international practice, is there's quite a lot of readily available published information which any of you can go away and, as it were, dig out and just see what there is. The caveat around it, of course, is that it does all relate to technologies which are established and are being used.

So it's certainly a guidance -- it's certainly there as guidance what is available now and what could be done now. New technologies [indiscernible] question mark, question mark. I think at that point I'll stop.

MS. JUCKETT: Thank you. On that note I kind of want the industry to kind of weigh in a little bit on what kind of technologies might be available right now and what kind of technologies are under development that might assist with those kinds of things. Let me go ahead and get Don's -- Don's got his card up.

MR. HANCOCK: Well, I was going to talk

about a different subject. So --

MS. JUCKETT: That's okay. Okay.

MR. HANCOCK: -- go ahead and get -- I think you're right. Go ahead and get industry reaction to what --

MS. JUCKETT: Okay.

MR. MCCULLUM: I think I'd leave that up to the experts on the various facilities.

MS. JUCKETT: Sven, do you have a comment?

MR. BADER: Yeah. I think -- you know, as Rex pointed out, there's a lot of information out there and publicly available, including the slides that AREVA gave the Nuclear Waste Technical Review Board which showed the continuous improvement of releases from La Hague, both airborne and marine environment releases. I think the stats that we usually cite are for [indiscernible] upwards of over 50 percent or better reduction in releases over the time frame.

And, in addition, there's also volumes of the high-level waste that we've reduced over the time frame from -- let's see. I actually have the number here somewhere. But it's a factor of eight reduction in volume of high-level waste per metric ton processed through the facility in the 20 years of operation at

La Hague. So there's continuous -- a culture of continuous improvement at the La Hague site.

And some of it is also dictated by the regulations in France. The regulations don't sit still for 20, 30, 40 years. They change basically about every four years, always looking for improvement. So, you know, we might meet a milestone -- that milestone is never fixed. You know, it changes, it gets tighter as time passes.

MS. JUCKETT: Jim, do you have anything on that?

MR. LIEBERMAN: No, I don't really have any knowledge or experience in this area.

MS. JUCKETT: Okay. Let me also ask about -- just for the NRC folks -- how technology might play into the ETR. Are there any specifics that will be included or that will be specifically excluded to make it more of a technology neutral type of consideration?

MR. LEE: I don't know if it's been mentioned previously, but I believe it was the Advisory Committee on Reactor Safeguards put together a literature review in the last three years that examined past experience in reprocessing. And it was prepared by, among others, Alan Croft [phonetic] and Ray Weimer [phonetic], guys that I believe had

actually done -- had been involved in reprocessing.

So I think that would be a data point -- not necessarily the starting point, but a data point that any ETR could rely on as to conceptualizing or bounding, if you will, what might be included in the topical report as kind of a generic or a case study.

MR. MCCULLUM: Was that [indiscernible]?

MR. LEE: I'm going to claim a senior moment. I don't know if it was the ACRS or the ACNW [indiscernible]. It could have been the latter.

But, anyway, if you go to the ACRS website, and I believe if you scratch around you'll be able to find it. It anyone wants the number, when I get back to Washington I'd be -- if you contact me I'd be happy to bird dog that.

MALE VOICE: It's Nureg 1909.

MR. LEE: There you go.

MR. MCCULLUM: Yeah. And I think that is a good reference. Another one I would recommend was -- I kind of hate to say this acronym -- the Global Nuclear Energy Partnership. They did a draft EIS. Now I'm not endorsing GNEP or anything it did when I say that, but there is some work in there that you might want to take advantage of when you look at your ETR.

MS. JUCKETT: Tom, you want to go ahead?

MR. HILTZ: Yeah. I just wanted to provide some confidence that both those documents are being used and looked at in considering the environmental topical report. In fact, I think it was sort of the response to the GNEP programmatic environmental impact statement where they received over 14,000 comments. That indicated to us the importance of being forward looking with regard to considering the environmental impact of this potential rulemaking.

MS. JUCKETT: Phil.

MR. REED: I would also like to follow up on what Mike said. Our advisory committee on nuclear waste and materials also wrote a letter to the Commission in which they talked about this issue and talked about the possibility of looking into new technologies or current technologies that could be used. They also recommended that we look at carbon 14 and tritium for 40 CFR 190 type applications.

You had asked a question as to how NRC might handle this issue. Well, one way to -- they might do it is to look at the Appendix I ALARA requirement. That's the way we implement EPA's regulations in reactors.

Now, the Appendix I requirement does have a requirement that if you add a piece of equipment you have to show that it reduces the dose I think $1,000 per person ram or $2,000 per person ram. So every time you add new technology supposedly this could go down and -- and the output limitations would go down.

You mentioned the Sandia report. The Sandia report contains some interesting data and information about how these new technologies -- or the different technologies would reduce the effluents based on cost. It has an interesting cost figure in there. So I don't know which way one would go, but this is certainly one approach that could be used.

MS. JUCKETT: Thank you. Mike, do you want to go ahead again?

MR. LEE: One activity that might be useful is -- being a former ACNW, ACNWM, and ACRS staffer -- there may be some value in engaging the ACRS or one of its subcommittees as part of the development process of the ETR to get their views. I think they have a role statutorily in looking at fuel cycle facilities, and they may have some insights or advice to offer.

So that's another resource that could be tapped into at some point in the process. I'm not

sure when or at what point it might be useful to do so. But I recall conversations in the hall that there was some interest at the committee level on this effort.

MS. JUCKETT: Okay. Great. Tom, I want to go ahead get yours and then, Don, are you ready to jump into your comment?

MR. HILTZ: I was just thinking a little more deeply about this sort of concept of neutrality in an environmental impact statement. And I think there are some important differences in implementing that and -- as opposed to a regulation where you might establish performance requirements that cover a broad range of technologies.

I think in actually considering an environmental impact you have to understand the processes and consider the environmental impacts associated with the processes. So, I mean, I think it's -- it may not be as easy to bound it. You may have to -- it may be substantial more work in developing a draft environmental impact to consider a broad range of technologies, fuel cycles, reprocessing than it might be to develop a technology neutral regulation where you look at developing certain performance criteria that may or may not be applicable

depending on the type of processes.

I just throw that out. That's sort of spit balling here. But I do think that there's probably a fairly substantial difference and I wish I was more of an expert in the environmental impact to articulate it more clearly.

MS. JUCKETT: Okay. Rod, do you want to go ahead and respond to that?

MR. MCCULLUM: Yeah. I think that I agree that that is challenging, and I also agree that you can't simply in an ETR or EIS envelope all the potential technologies.

But I do think you can be technology neutral by breaking it down into different scenarios. I mean, EISs traditionally look at different options and different alternatives.

You can construct scenarios to represent the various technologies and look at the environmental impacts of those. And I think the ETR would be helpful in drawing out in some of the scenarios where there might be gaps in the information that we need to look at filling.

One document I would recommend in that regard -- there was a 2006 -- and I'll try not to speak in acronyms here -- it's the Nuclear Energy

Agency of the Organization of Economic Cooperation and Development of the United Nations. It laid out material balance flows for a number -- about a dozen different recycling schemes and a lot of different information on, you know, what some of the effects of those would be postulated.

I think you could go to those and find two or three of those -- or how ever many was necessary -- of those schemes and make those scenarios in an ETR or an EIS that could then represent the various technology alternatives that we might pursue. And then you could have a -- if not completely technology neutral, a technology encompassing EIS then.

MS. JUCKETT: And I think that's part of what I was actually trying to ask before too -- is whether or not an ETR would include various scenarios -- would it go into the level of detail to include various scenarios as far as outputs based on what processes would be considered and how many different processes would be considered and whether it would consider where the sites would be on a broad sense or no? Okay. Don, are you ready to go ahead and make your comments?

MR. HANCOCK: Well, the very last thing ties into one of the things I was going to ask about.

The slide 3 talked about things that the ETR was going to discuss, including description of potential facilities and interactions with the environment.

It seems to me facilities and potential sites go together. But I want to -- or could go together -- need to be discussed. And I wanted to get some understanding of how that was going to be included.

The GNEP have been referred to a couple of times. And among the things that document was doing was looking at possible sites. So I think that's important.

I think also in that regard there needs to be some discussion of sites with existing contamination versus sites that don't have. And to just spill out that concern we've been concerned in New Mexico about how at a contaminated uranium site the NRC was willing to consider the level of contamination at the existing site as being background, which is totally unsatisfactory from a lot of standpoints. And we're very interested in knowing early on if that's how NRC plans to consider reprocessing as well.

So, you know, those issues need to be, you know, identified and discussed. And, you know, I

would argue as much as possible some of those issues -- or those kinds of issues need to be dealt with in the ETR. And it wasn't clear to me from what Wendy said in her slide as to whether those kinds of things were intended to be included or were not intended to be included. So I'd like to get some clarity about that.

MS. JUCKETT: Is there an NRC response to what might or might not be included as far as background based on what is previously existed, whether natural or unnatural?

MS. REED: Right now the ETR is in very early stages. And so as to the kind of sites, the kind of considerations that would be included I don't think I can comment on that. But I think that is -- that's a very useful point that Don made is on something to think about the use of existing contaminated sites.

MS. JUCKETT: And I'm assuming that by use of contaminated sites you're -- Don, you're wanting to have it considered not as background.

MR. HANCOCK: Well, of course, that would be my preference, but I don't know that that's the industry's preference. They can, you know, speak to that themselves.

I think there are fundamentally -- I think there are a lot of issues that come up when you're talking about using an already contaminated, already licensed site versus a new site.

And in the GNEP context -- to go back to that, you know, there were a variety of sites that were analyzed at some level. Some of them were sites that had never been used or were, you know, quote, pristine sites, and some of them were not. And so -- I mean, that issue is already on the table from the public standpoint and from, you know, that whole process which has been referred to here.

So I think the ETR needs to, you know, deal with that issue in some way. And I would -- I believe it does need to be dealt with in the ETR, so that's why I was asking where it was. And the response I've heard so far is you're in an early stage so you don't know. So I guess I want to encourage that point.

And sort of related to that and so far as the industry has views about those issues -- sites on the one hand and then sites that have already contamination versus sites that haven't in terms of what their -- the range of thinking they might have about those things. That would be helpful to have

identified early on in the process, whether -- hopefully in the ETR, but at any case in some near term time frame.

MS. JUCKETT: I think that's a really good message for NRC to be able to take back and consider. Jim, you've had your card up for a while. Let me get your comments.

MR. LIEBERMAN: I want to raise an issue that I know will be controversial. Again, I'm speaking for myself --

MS. JUCKETT: Go ahead.

MR. LIEBERMAN: -- and not for NEI. But the real issue is what type environment review do you really need for a performance based rulemaking. Part 20, which has a lot of safety implications, a lot of importance did not have an EIS.

The license termination rule restrictive release -- the restrictive release portion of that rule did not have an EIS. The reason why it didn't have an EIS was because the restricted release was a performance based standard. NRC didn't know how it would be used. And each individual application of the license termination rule with a restricted release would need an EIS. And then you consider the impacts of the particular site.

Here we're talking about reprocessing where we're going to have, maybe two -- but we're certainly not going to have a lot of these facilities. And each facility will be unique at a particular site with a particular background. Whether it's going to be a land site or an ocean site or wherever the site would be will have unique impacts. And [indiscernible] will have to need an EIS for that particular site to consider all the impacts and comply with NEPA.

So I think it's very hard to do this generically because you don't know what the designs are going to be, you don't know what the releases will be. So I question how much environmental review you need at the front end and whether it's better served doing the environmental review when you have an actual design and location in hand.

MS. JUCKETT: Anyone have a response for that? Go ahead, Don.

MR. HANCOCK: I think the flip side of the concern that I have in response to that is that we've been told over and over in the last two days what the process is to get to the Commission to decide whether there is going to be a rulemaking or not.

And if you're not going to include in that

discussion for the Commission, you know, some of these what I consider to be pretty fundamental issues in terms of siting and that sort of thing I don't think you've really adequately teed up for the Commission what's -- you know, what's involved.

And so on the one hand I hear your concern of, you know, you don't know everything there is to know. But I think that needs to be clearly conveyed. And, two, I think needs to be conveyed what some of the issues that probably do need to be known before you can effectively go forward with the rulemaking.

So, I mean, there's clearly a balance -- we've used the balance term a lot back and forth. But from my standpoint -- and I think from other people's standpoint -- the Commission can't be making a rulemaking decision in a vacuum of, you know -- to -- you know, industry -- some of the industry wants to do this and so here are the resources to do it, so let's do it.

It goes back to some of the concerns I voiced yesterday about what the balance are in terms of resources generally. But if there's -- if there is going to proceeding -- proceeding with the rulemaking will be perceived a pretty major activity on the part of the Commission. And I want to kind of emphasize to

staff -- if the industry doesn't want to hear it, at least to the staff -- I want the staff to understand that that decision itself can be very controversial and the Commission -- the ETR and other things leading up to that need to convey kind of that range of concerns that people have.

MS. JUCKETT: So it sounds like on the one hand, Jim, you're saying that there's not enough detail to go into it when you don't have all the site specifics and you don't have the technology in place. And on the other hand it's hard to make a rulemaking without having any kind of information in a vacuum, so to speak.

MR. LIEBERMAN: Yeah. I didn't want to imply you don't do any environmental review. You have -- certainly have to do an environmental review, but the degree of detail might not be an EIS -- it might be an environmental assessment.

You clearly have to have appropriate environmental review to be able to consider the impacts of what you're doing. But how far you go down that -- I mean, NEPA has various stages. How far you go down that pike I just want to throw out the question.

MR. HANCOCK: But a fundamental place that

you start with NEPA is what's called scoping. So, you know, you and I and whoever else here can't be deciding the scope here. That's a public process too. And on that -- you know, that needs to be started very early.

But so -- but just so we're not confusing two things -- I mean, on the one hand we're talking about the ETR, which is a near-term thing. On the other hand the EIS process itself is, you know, somewhere farther down the line related to going forward with the rulemaking. And I'm concerned about both of them.

But in the near term -- and my most recent comments were related to making sure that the ETR is not so, quote, truncated -- my word, not the staff's word -- that it really doesn't provide adequate information for the Commission.

MS. JUCKETT: Okay. Let me get Rod's comments on that.

MR. MCCULLUM: Yeah. I want to point out that while I find Jim's proposal intriguing -- as he mentioned it was a Jim Lieberman proposal -- industry has not formulated a position on this.

And what industry's position is that, you know, whatever is done here will be done in full

compliance with environmental law. We do that at all of our plants and all of our facilities.

Now, the environmental law in question here is, of course, NEPA. And this also goes, Don, to your question about contaminated sites as well. I mean, we need to do what NEPA requires for those sorts of things.

The purpose of NEPA is to inform decision makers of the environmental aspects of their actions. And in this case the decision makers are the Nuclear Regulatory Commission in the case of this rulemaking. So it makes sense that we want to comply with NEPA in making sure that the proper information is put forward.

I think this goes to my previous comment. This is another reason why public comment on the ETR would be useful. I think that in the ETR NRC could lay out its approach for complying with environmental law in this case. And I think the reaction that you would get, both from stakeholders such as Don and from the various parts of the industry, would be valuable in making sure that you do comply with NEPA going forward in a way that's instructive to everybody.

MS. JUCKETT: We'll go ahead and go to Tom.

MR. HILTZ: I just wanted to emphasize a couple of points. Number one is that no final decision has been made with regard to what form the environmental review will take. The staff's initial view is that this is -- this will be a major federal action. And, therefore, we are doing the preparatory work to potentially support that action if rulemaking is approved.

And the decision about whether it's a major federal action will be made between the staff and the consultation with OGC, at least in the recommendation that goes up to the Commission -- OGC is their Office of General Counsel -- or their lawyers.

The second point I want to make is no matter what form the environmental assessment takes the ETR will be positioned to support the NRC's review of that. So if in the long run it's determined not to be an EIS then the ETR will end up supporting an environmental assessment that will comply with the NEPA, but above all will do what we need to comply with NEPA with regard to the potential for the proposed rulemaking.

MS. JUCKETT: Okay. Thanks. Anybody else have a comment on that? I promised I would try to

keep this to a -- the time allotted so that everybody could kind of get out on time.

So before we finish up with this particular session I wanted to know if anybody had any comments that they wanted to make about any of the discussion points and open it up a little bit for whatever has been heretofore off topic but -- about the ALARA or about the 40 CFR 190 limits or anything like that. (No response.) We are ready to go. Sven does. Okay. Go ahead, Sven.

MR. BADER: I can't leave 40 CFR 190 alone. I know EPA is not represented here, but from the technical basis that I believe Nate here is a principal author it's clear the regulation needs to be revised.

Again, we need from an industry standpoint be able to tailor our waste streams to meet all the regulations and to optimize them to minimize cost and do our business development. And I think it's really imperative that we get EPA on board here to start moving forward with this regulation.

I know there's some naysayers to this because there's some elements -- or some radioisotopes that are not up here that I think Beatrice noticed. Notably carbon 14 is not up there.

As an industry we want to know are there going to be limits on these that we need to be able to design for. We talk about future technologies. There are trade-offs with future technologies.

Krypton's a good example. You can put on a very, very expensive system. But it comes with its own problems. It's a potential explosion hazard. You've got krypton stored in some kind of container that we need to design and probably prevent a mass release of krypton from certain events -- seismic being a good example.

So -- and then the other point I'd like to make is that if -- the slides you had up there -- you probably noticed this curie per gigawatt electric year. It'd be really nice if there was an industry standard put up there. A dose number is really what we're looking for as opposed to these peculiar units. So I'll leave it at that.

MS. JUCKETT: Okay. Thanks. NRC want to make any comments? Go ahead, Marissa.

MS. BAILEY: I guess I would recommend that the industry and DOE engage EPA. We have engaged EPA, but ultimately our job as regulators are to -- is to implement the [indiscernible] regulations.

MS. JUCKETT: I don't see any other cards

up. It's on the agenda to go ahead and go to public comment. Are there any comments from the observers on this topic? (No response.) Okay. I'm going to hand it back over to Chip to wrap up.

MR. CAMERON: Thank you, Miriam. Well done. I'll -- this is an opportunity right now for each of you around the table to make any closing comments that you want about the workshop, the process, the rulemaking.

And we also want to hear after that from Lawrence Kokajko who is going to be taking over the management of this particular rulemaking after his success in the high-level waste program. (Laughter.) I'm sorry. Sorry, Lawrence. I couldn't let that go. But, anyway --

MR. MCCULLUM: Chip, in all seriousness I think it was a success. I mean, whatever external forces have interrupted his success, if you look at where the process was, the regulation that was written, the guidance, the review plan, the review process, the RAIs -- there's a lot of positive lessons that the whole rest of the agency can learn from the way that process was conducted.

MR. CAMERON: And that is well noted. Thank you, Rod. Very, very, very good point. And I

shouldn't let my joy in giving Lawrence a hard time result in a facetious remark like that. So thank you very much for that. And, James, do you want to start us off?

MR. ROSS: Yeah. In the spirit of having a closing comment, we did talk a lot about the technology neutrality of any new regulations. I just want to reemphasize that we really support that. When the Nureg do come out don't be surprised to see G.E. hold pretty firm on that position.

We think we need to stay consistent with Part 50 in the way we've done things with fuel facilities and with enrichment facilities. So I just wanted to make sure reemphasize that point from our perspective.

MR. CAMERON: Great. Thank you, James. Why don't we go this way and we'll come back to Tom and then finish up with Marissa. Robert, anything -- well, we'll go to Jim. But, Robert, anything that you'd like to say to us?

MR. HOGG: Yeah. I guess I held off on the last couple of sessions of discussion in preparation for really wanting to say one thing succinctly at the end of this.

And that is, you know, we can choose to

lead or we can choose to follow. We can lead in environmental protection or we can follow in environmental protection. We can lead in technology development or we can follow in technology development. We can lead in regulation or we can follow in regulation. And there are many other things we can lead in or we can follow.

I would envision -- or like to believe that this group of people and others -- many, many others involved in the technology, control of the technology, the observation and participation of this technology would like to be leaders.

MR. CAMERON: Okay. Thank you. Jim?

MR. LIEBERMAN: I think I've spoken enough today. I don't really have any further comments.

MR. CAMERON: Okay. And Anne.

MS. CLARK: My comment is sort of slightly off topic. But it's just in the broader scope of things from a state point of view that the states are most concerned about collaboration with their public's concern. And that in my particular program has been manifested in the development of a comprehensive set of standards that the Department of Energy agreed to in transporting waste to the waste isolation pilot plant.

But that kind of collaboration can look like -- can apply to anything. And that's what we push for through our regional groups like the Western Governor's Association -- is to make sure that the federal government is reaching out to the states and asking what their concerns are and asking what do their -- what does their citizenry need.

MR. CAMERON: Good point. Collaboration. And, Beatrice?

MS. BRAILSFORD: I guess I am -- I have been struck by and am concerned by the level of which there is an expectation that this process will be more responsive to industry than I think might be wise.

MR. CAMERON: Okay. And, Don? Thank you, Beatrice. Don?

MR. HANCOCK: In one sense I want to end up where I started yesterday. And from my standpoint, and I think from other folks in New Mexico's standpoint, we're not interested in participating for the purpose of participating. We're interested in participating to be heard and responded to.

That doesn't mean everybody's going to agree but that our concerns, in fact, be taken very seriously. And, as I pointed out yesterday, there are concerns that we have about both the NRC's track

record and the industry's track record.

And so going forward we're -- we appreciate the fact that you've used this format and so that folks can be engaged, but engagement doesn't necessarily equal the kind of responsiveness that we haven't seen historically and need to see in this process.

MR. CAMERON: That's true. Thank you, Don. Sven?

MR. BADER: I have to profess I'm a little disappointed that I didn't hear Rod say risk based performance -- risk informed performance based about 20 times during this meeting.

But from an AREVA standpoint, yeah, we're clearly interested in moving forward with reprocessing/recycling in different parts of the world, including the United States.

And to come up with a viable business model we need to have regulatory stability. I think that's really what we're striving for here. And I understand the task is daunting, but if we could accelerate the task, you know, AREVA would appreciate it. And I understand that most of this is contingent on what the Blue Ribbon Commission is going to come up with. You know, I'd be really interested to see what

they come out with in the end.

But from AREVA's standpoint we think that they will not find against recycling and that might give us an avenue with the current problems with final disposal to deal with some of the wastes that are available for recycling.

MR. CAMERON: Okay. Thank you. Thank you, Sven. And, Rex, thank you for coming all the way from the northeast Atlantic.

MR. STRONG: Well, thank you for that comment. I mean, I have been interested and I think genuinely impressed by the level of discussion that's been going on around the room.

One point that you might want to consider for a continuation of this process -- I mean, this is a large room and there are quite a large number of empty seats out there. So I am just left wondering what other contributions could have been made to this debate which would have left us all better informed that, in fact, we are.

MR. CAMERON: Thank you. And a good point. Rod.

MR. MCCULLUM: I want to thank the NRC for holding this forum. I learned a lot, as I did learn a lot from the workshop that was held in Washington.

One of the things I learned in this one was that if you give me my very own microphone -- you notice I didn't have to share and everybody else did -- I talk way too much.

And I don't want that to convey the notice that perhaps industry is too much driving this process. We know very well of NRC's independence and we know that you've taken a lot of steps which we agree are important -- but they're steps that you are making decisions to take.

I want to emphasize that this is -- whether it's a good thing or a bad thing -- that we got this point as a nation. It's a tremendous opportunity we have before us.

Now is the time to put the regulatory framework for this in place before the policy decisions get made so those decisions can be informed with a knowledge of what it's going to take to make this safe.

And I learned a lot in these forums from both. In Washington we had one group of activists and we had another group here, and I think maybe some other seats need to be filled too. But I think we all have in common the goal -- the one thing we can all agree on is we want to flip the light switch, have the

lights come on, and be assured that whatever's at the other end of those wires is safe.

And we are learning that -- how we use our world's resources is an important component of safety. And maybe things that don't use resources wisely and warm the planet may not be safe. Indeed, recycling is an aspect potentially of how we use our nuclear resources more wisely.

So I urge -- I like everything I hear here in terms of that NRC is moving forward to take advantage of this opportunity. I think there need to be more meetings. There need to be some detailed discussions, and I think we flagged those things here.

I would encourage those discussions to be open to as wide an audience as possible and look forward the dialogue continuing -- look forward to this rule coming out so that we can make these important decisions.

MR. CAMERON: Thank you. And thank you for all the things also. Mike?

MR. LEE: Present.

MR. CAMERON: All right. Is that -- that's good enough. Okay. Wendy -- and thank you for your presentation on the environmental part. That was really -- that was terrific.

MR. LEE: Not to be flip though, the conversation was good today. It kind of reaffirmed some things that we were already thinking about in terms of this Commission paper that's due to the Commission in December. So we just, of course, have to let that process work itself out and --

MR. CAMERON: Good. Good. Wendy, anything?

MS. REED: I was just going to say thanks for -- everyone for attending. There's been a lot of good discussion over the last two days, and I think there's a lot of information that the working group take back and help with their deliberations about the technical basis document.

MR. CAMERON: And, Phil.

MR. REED: I would like to say the same thing. Thanks very much for the people that came and thanks very much for the suggestions and comments and recommendations that were made. I think many of these are very useful for us and we'll take them back, discuss them, and you might see them again in the technical basis document.

MR. CAMERON: Good. Tom?

MR. HILTZ: Thank you, Chip. Certainly want to associate myself with all the folks who have

thanked the members who have come out here today. I want to thank the staff and our panel members. I particularly want to thank you, Chip, Miriam, Jose, Jeanette, Carol, who's been vigilant back there transcribing, and Alex Murray who could not make it here but put a lot of effort into planning and preparing for this workshop.

At the risk of, you know, incurring some angst among folks I think there's a tendency at least in this meeting and in the meeting in Rockville that we all think we have good discussions -- and we do have good discussion. But they never seem to be punctuated with a final conclusion.

So I wanted to go through and list some of the things that I took away as I believe consensus points that hopefully capture at least my -- well, I know they capture my understanding and hopefully capture the group's understanding.

With regard to the regulatory framework I heard a lot of support for Part 7X. I heard -- did not hear any concerns about moving forward with a separate Part 7X. And, conversely, I did not hear a lot of support for revising Part 50 or revising Part 70.

I think there was -- or perceived there

was a consensus of moving forward with a risk informed performance based approach. I think that there's much more discussion that probably needs to happen with regard to technology neutral, particularly being sensitive to our stakeholders -- all our stakeholders in understanding that.

And that may just be a better articulation about what the benefits are -- better articulation about what we mean and how we're going to implement a technology neutral framework.

We talked about one step licensing. I think there was support for having the flexibility in the regulations to do both a one step and two step licensing. While we didn't get to detailed discussion about whether we should have a license that licenses a reprocessing facility in total which might mean storage, reprocessing, fuel fabrication -- I think I heard some comments from Don particularly later on that licensing all those things at once maybe provide more coherence and more stability in the process rather than trying to piecemeal it.

With regard to whether we should have a revised Commission safety goal I did not hear any overwhelming support for interacting with the Commission on another safety goal -- or no basis for

why we might need to do that.

As far as the appropriate approach between quantitative and qualitative I perceive the consensus to be that there needs to be a mix -- and some folks use the word semi-quantitative -- mix taking those aspects of PRA that are appropriate for a reprocessing facility and mixing the best of the ISA and PRA for reprocessing facilities.

And we had the question about, you know, does -- will we apply the Commission's PRA policy statement -- and I think I heard the answer to that was, yes, if we do that and we consider the best use in the state of the art and what's practical then we will meet the intent of the Commission's policy statement related to probable realistic risk assessment.

With regard to the operational requirements for reprocessing, I think I heard consensus that we certainly need to have a minimum [indiscernible] of generic design or criteria or baseline design criteria. I think we again heard the advocacy from some of the stakeholders to provide the flexibility in those baseline design criteria to accommodate a range of technologies.

On licensing -- operator licensing I think

we heard that although Part 55 is not directly applicable that there are aspects of Part 55 that we need to consider with regard to the industry role in training and certifying its operators and how the NRC might actually issue licenses to a small subset of operators associated with high consequence -- potentially high consequence sequences.

I was a little unclear about where we landed on cyber security. I thought that it was -- it might not be ripe enough to be included as a baseline design criteria. But I think that more will be developed on that as we proceed in other regulatory fashions with considering cyber security.

On the issue of waste management processing I concluded that I need to get smarter on that. I concluded that it's a complicated issue that maybe if people on the staff -- and not that I'm the, you know, 50 percent on the staff -- but if people on the staff have trouble understanding what the issue is I think there's maybe a public outreach associated with that and some additional clarity that we need to do.

I think we also really need to frame the issue and scope the issue because I do think that there's a potential for some creep there to solve

other problems while we solve the reprocessing problem.

And overall I concluded that the workshop was valuable. And I concluded that it wouldn't have been as successful without all the participation of the panel members. So, again, my thanks for your support and participation.

MR. CAMERON: And thank you, Tom. And before we go to Marissa I think we just need to clarify one thing that she said because I think Beatrice sensitized us to this with her remark.

When you started out and you were talking about the issue of do we do Part 50 or Part 70 or we do a new regulation you said 7X. And you weren't referring to this particular 7X that the industry had developed. And I just wanted to make that clear. Okay?

And I also might add is that we did refer to the NEI 7X a lot. And it wasn't necessarily because of the fact that we were holding that up as something that was the bee's knees so to speak. But it was a straw man on some of the issues that we could use to illuminate some of the issues I think.

MR. HILTZ: And thank you, Chip. That's a very important clarification. When I say -- I mean a

new part that would likely fall under 10 CFR Part 7 -- whatever the next open number [indiscernible] 70 -- 7Y -- thank you.

MR. CAMERON: Okay.

MR. HILTZ: And I also want to say that I noted in both Beatrice's and Don's comments that they used the word responsiveness. And I certainly would appreciate perhaps a discussion after this about how we could be more responsive.

One of the purposes of having this workshop is that we wanted to broaden the exposure to this topic. We didn't want to just have industry input into it. And so we wanted to try to engage stakeholders. And if you think there things that we still need to do better -- if you think we didn't hit the mark I'd certainly appreciate hearing some of this comments.

MR. CAMERON: Thank you, Tom. And Marissa?

MS. BAILEY: Ditto on everything that Tom just said. Thank you to everyone that he thanked. I agree with his summary of the conclusions -- or I guess the punctuation that he reached, including that he needs to get smarter.

I want to take this opportunity to

apologize to Sven, and I'm sorry that he left for my snarky response to his comments, so let me try again.

The NRC has reached out and talked to EPA officials to express to them the concerns that we've heard about the applicability of 40 CFR 190. And they are very early in the process as far as us looking at that regulation. And certainly the NRC -- if EPA does decide to go that path and change the regulations the NRC will engage them and give them our perspective on that rule.

But ultimately we will implement the rule -- the applicable rules that EPA promulgates. And I think that's what I was trying to say and I just had to say it more diplomatically.

In response to Beatrice's comments and also Don's about our responsiveness, I hope that in this process we are responsive to all of our stakeholders, not just the industry stakeholders. And so, like Tom, I would certainly welcome any feedback as far as how we could be more responsive to all of our stakeholders.

And, finally, I just want to repeat NRC's role in this process in reprocessing. We are not advocates for reprocessing. We don't have a position for or against reprocessing. Our role is to make sure

that if there is a license application for reprocessing, if that is the direction that the nation wants to go, that we can review an application, we have a regulatory framework that's stable and that's predictable, and that is adequately protective of public health and safety. And that's the -- that's our job. That's where we want to go. And I think I'll end it at that.

MR. CAMERON: Thank you very much, Marissa. And now we're going to hear from Lawrence. And do you want to use this or -- go ahead.

MR. KOKAJKO: Good afternoon. And I have three general sets of comments. And the first one is, as I am assuming this project I'd like to thank Marissa Bailey, Tom Hiltz for the extraordinary job that you guys have done in managing their project to date and effectively managing it in such a way that it's going to be effectively transitioned to my team and Jack Guttman [phonetic]. We're going to be talking about planning to continue this effort and build on these successes. So I look forward to working with you and Jack Davis on that.

The second thing I'd like to say is I'd like to thank the panelists, particularly those who have had to travel from a long distance to be here. I

know that it can be challenging to be on a panel like this with a free and open exchange, and I want to let you know that I do appreciate your efforts in that regard.

And, finally, I'd like to thank the incomparable facilitator Chip Cameron and, of course, his sidekick Miriam Juckett here.

In terms of the -- dealing with some of the issues and that Tom Hiltz I think summarized very adequately I'd like to restate a couple of things. One is that policy is evolving at the national level and we are actively monitoring the BRC, as I had mentioned earlier.

And my division feels that we have to do some type of prudent preparation for whatever comes to pass. We have been doing that with my two deputies, Jack Davis and Abby Mohseni [indiscernible]. We believe we are staged to handle any of the activities that could come out of the BRC.

I believe, by the way, in a very strong and independent regulator. And I believe this is -- this preparation is essential to our success. And part of that independence means that we are not unduly swayed by any particular group or thing or process.

And one way that I think we can achieve

that is having real stakeholder involvement and hearing from all sides. And so, Beatrice and Dan, I appreciate your being here and working with us over this past two days. And also to Anne as well -- thank you.

The second point I wanted to say is that, you know, I'm sort of relatively new to the concept of technology neutral. I know it's been around a while, but I've really never had to deal with it before.

And conceptually I sort of align with the idea. However, one thing I align more strongly with is a real risk informed performance based framework. And performance based in particular I have found to be very helpful because it's outcome focus and it's focused on those boundary conditions that said this is where the line is drawn -- this is what the safety is all about. And I like that approach. And I've actually had some experience implementing it of late.

And one thing that I would like to point out is that we do value public involvement. We do value stakeholder involvement because stakeholders -- all stakeholders could help us to define those boundary conditions. And so I look forward to helping to define these boundary conditions for this as time progresses.

Similarly, someone had made a point about PRA could lead to false confidence. I don't know who said that. I do believe that's true too, but any use of any risk tool can lead to false confidence. And that's why the PRA is risk informed, not risk based. And I believe this is again a prudent regulatory strategy.

The third substantive comment I'd like to state is that I do believe in the use of risk tools. I believe they are a central element to our understanding of the processes and how things should work.

And I don't know agree if PRA is the approach or semi-quantitative ISAs or maybe a modified version of a performance assessment strategy that we've employed in the repository program. I'm not sure which is the best right now. And I am familiar with ISAs in terms of Part 70.

But I think is another thing that we can work together to try to achieve some type of successful outcome for the benefit of the technical basis, the proposed rule, and anything else. Again, to prepare for whatever future may come.

And the third and final thing I'd like to say is I look forward to this unique challenge. I

look forward to working with everyone. And I look forward to a successful outcome. Thank you.

MR. CAMERON: Thanks, Lawrence. And there are the infamous feedback forms which are basically if you have any comments on how the NRC can improve the meetings please offer those to us. And you can send them back in -- they're franked -- by mail or you can leave them here. But thank you all very much.

(Whereupon, at 5:05 p.m., the meeting was concluded.)