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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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MEETING ON A POTENTIAL RULEMAKING FOR SPENT NUCLEAR FUEL REPROCESSING FACILITIES

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WEDNESDAY

JUNE 22, 2011

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AUGUSTA, GEORGIA

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The Meeting was held at the Hilton Garden Inn Augusta, 1065 Stevens Creek Road, Augusta, Georgia, at 8:30 a.m., Chip Cameron, Facilitator, presiding.

PARTICIPANTS:

SVEN BADER, AREVA

JIM BRESEE, US Department of Energy

TOM CLEMENTS, Friends of the Earth

SUSAN CORBETT, South Carolina Sierra Club

DENNIS DAMON, US Nuclear Regulatory Commission

YAWAR FARAZ, US Nuclear Regulatory Commission

JOHN GREEVES, JTG Consulting

BRITT HILL, US Nuclear Regulatory Commission

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STEVE WARD, US Nuclear Regulatory Commission

DEREK WIDMAYER, Advisory Committee on Reactor Safety

MARK YEAGER, South Carolina Department of Health and Environmental Control

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

8:30 a.m.

MR. CAMERON: Good morning, everybody. I guess even though this is Georgia, there was good news from Omaha last night, the Gamecocks won, okay.

And a second public service announcement, the items that are in the -- what's called, I think, the Market Pantry, they are food items, you do have to pay for those, and so, the -- I guess a number of items have been walked off with, so, that's just a reminder.

And in terms of agenda for today, before we get into our first substantive discussion, I just want to see if there is any burning issues, clarifications, observations, questions from yesterday, and our agenda is going to be, we're going to start off with safety, risk and licensing, and we have John Stamatakos, who is over there, who is going to be doing the presentation, and we also have Yawar Faraz. Yawar is up at the table, and Alex Murray and Dennis Damon, who is here with us, are going to be assisting John with that discussion.

This afternoon, we have the security and material accounting and -- material control and accounting issues.

I thought your discussion yesterday was good and coherent, and I'll open the floor to Jim Bresee.

MR. BRESEE: Yes, I just wanted to --

MR. CAMERON: And we need to get this on the transcript.

MR. BRESEE: Thank you.

MR. CAMERON: There we are.

MR. BRESEE: I wanted to finish a topic, which we started with yesterday. We talked a bit about the difference within the Department of Energy, the difference between what is called spent fuel and what is called used fuel.

For convenience only, we have been treating used fuel as fuel capable of recycle, with some potential fuel value and spent fuel, as fuel which has been -- gone through sufficient burn up, that it no longer has economic value and would be a candidate for deep geologic disposal.

I'll have to admit that in the discussion of these terms, and they have no legislative basis. They're simply a convenience.

But in the discussion of these terms, there were several of us who felt that even the word 'used' wasn't a very good description, it has a sort

of broken, worn out sound to it.

So, I put forth the idea that we'd call it previously owned. That's enough of that.

MR. CAMERON: Like the automobiles, okay.

MR. BRESEE: Thank you.

MR. CAMERON: So, now, and within DOE next week, it's going to be previously owned. So, everybody is going to be doing that.

Okay, thank you, Jim. Mary?

MS. OLSEN: You asked for any clarifications, updates from yesterday, and first, I want to acknowledge that I had a prior commitment to teach a class this afternoon. So, I'll be leaving in the middle of the day, and it's not under protest. It's just previously committed.

But I do want to state that of all the meetings I've been invited to participate in, in 20 years, I really did contemplate not participating, or making some stronger statement than sitting here at the table, because in our view, the actions of Presidents Ford and Carter were stellar moments in the history of our country. They were little, teeny, tiny brights spots of sanity in what we otherwise call nuclear madness.

We do not, for an instant, think that the

Nuclear Regulatory Commission can set standards for reprocessing that will not be implemented. Build it and they will come.

But as far as we're concerned, reprocessing is the dirtiest part of the fuel cycle. It is considered, in our community, worse than building new reactors, and the whole idea that regs would be set and not used is just lunacy.

I mean, go to the page in the NEI paper that talks about certification of operators. Certify that they are mentally, physically and technically fit.

Well, NRC, you're flunking that, to have the idea that you're going to write regs that nobody is going to use, and you don't think you're not setting policy? That's a triple negative. You are setting policy, by setting regs.

So, I'm yelling at you this morning, and I'm slightly miffed at myself for getting this loud about it, but quite frankly, it's a mild act, compared to what I think many people would peacefully do.

You know, anger is one thing. Violence is another. We're really pissed about this. Peaceful action, to oppose it, is what I think you can anticipate, because it is not a right action.

I'm going to say one more thing, and then I'll be quiet.

At the moment that I brag on Ford and Carter, I do have to, when I face a room of people, like I was at Clemson, maybe six months ago, talking about this history, I feel some shame.

Why do I feel shame? Because it was India getting the bomb that made them have a little bit of sanity about plutonium, but what a racist act. Oh my God. The brown people have the bomb, and so, now, we're going to stop playing with plutonium.

But we're still going to have all our big weapons on hair-trigger alert, and we're still going to run the whole world with that supremacy and we're going to make this little, teeny action and say, we're not going to reprocess.

And yet, that little, teeny action has been one tiny light on the Hill, that maybe, the super powers could move away from mutually assured destruction and, you know, it just cracks me up, this nuclear threat initiative, that the same guys -- that's another whole subject.

But the long and the short of it is, NRC is moving towards inculcating the cult of plutonium in the United States, and that's what it is, and it is

the biggest, dirtiest process.

And so, the final little update I want to add is that there was a reference to meeting Part 20, and that's all well and good, but I would direct the entire attendance, and those reading this transcript, to page 312 of the Biological Effects of Ionizing Radiation Beer 7 Phase 2 report, where we get Table 12D-3.

If, in fact, we have a Constitutional Democracy, which we do have in the United States, that goes guarantee equal protection under the law, NRC really needs to look at this table of data reported on health effects, and square that with Part 20, because the data in this table shows that women are 50 percent more likely to get cancer and 50 percent more likely to die of that cancer, compared to a similar dose to men.

I just need to add, this isn't our being pissed, okay. This isn't our happening to like to do whatever we like to do. This has to do with percentage of reproductive tissue in the body, and the fact that reproductive tissue is more sensitive.

So, as I sit here in the Augusta and South Carolina area, knowing the number of people that I know who are already sick, and knowing just

anecdotally, how many of them are women, and looking at the possibility that NRC is going to open the flood gate on one of the most effluent-rich opportunities for the nuclear industry, to dump more radioactivity into the environment, I want to affirm the comment that was made yesterday, that there is a difference between meeting dose levels and talking about total emissions.

And when you look at total emissions from a processing worldwide, and I understand, I'm talking about old technology and you're talking about new technology, but your new technology is not proven. We are talking about massive effluent.

So, really, these are not hypothetical actions that NRC is considering taking, and the biggest gap is the health and the future of our species, because women getting more impact doesn't work, for that.

MR. CAMERON: Okay, thank you, Mary. One function that these gatherings serves is to allow opinion leaders, like yourself, to give strong words about heart-felt, strongly felt issues.

So, we appreciate that, but also, thank you for participating in the discussion on the issues that the NRC is trying to address, also. Tom?

MR. CLEMENTS: Just a quick point. I want to make sure that people knew there was an article today in the Augusta Chronicle, about the meeting yesterday, and Susan and her greenwashing quote are in there, and Rod is quoted, as well. It's online, but you can pick up a copy, as well. Thank you.

MR. CAMERON: Okay, thank you very much, and with that, I think we're ready to go to John, and he is going to do the presentation, and then, we'll start the discussion. Thank you.

MR. STAMATAKOS: Yes, good morning. My name is John Stamatakos, and I'm going to talk through five gaps, Gaps 5, 7, 9, 10 and 11, and I work at Southwest Research Institute's Center for Nuclear Waste Regulatory Analysis. We're an FFRDC charter to support the NRC.

Okay, so, Gap 5, I think, is probably one of the heavy hitters in the group. It's the safety and risk assessment methodology, the approach that would be used in licensing a reprocessing facility.

The gap itself is that NRC regulations required licensed facilities to demonstrate adequate assurance of safety, limiting risk to acceptable levels, and that the existing regulations in Part 50 and Part 70 don't adequately address the potential

consequences of risks of a reprocessing facility, and it's really this first sub-bullet that's probably the most important, and that is based on analysis of what a reprocessing facility might be like, the potential source terms, in particular, fission products and actinides that are part of that stream.

The number of scenarios, the complexity of the operation are greater than fuel -- existing fuel cycle facilities, and so, given these potential risks, the requirements to license a reprocessing facility solely on the integrated safety analysis approach in Part 70 may not be adequate.

So, NRC staff position on -- proposed staff position on a licensing of a fuel reprocessing facility will be to use the ISA, but to incorporate quantitative risk assessment methodologies in the evaluation.

So, the approach that's been proposed in the Gap summary is to use a hybrid ISA and some form of a probabilistic risk assessment, to try to capture the full complexity and source term of a potential recycling facility, reprocessing facility, excuse me.

So, the notion would be to use the ISA to identify and categorize that accident sequences and then use a more quantitative approach to evaluate the

high consequence or very high consequence event sequences.

One of the -- obviously, the important and big jobs in this approach would be to develop appropriate guidance to support the application of a quantitative risk assessment methodology.

In addition to that, the other standard parts of an approach would be to apply safety controls, what are called items relied on for safety, or IROFS, to reduce the total risk and minimize risk to receptors by applying as low as reasonably achievable (ALARA) and as low as reasonably practical (ALARP) concepts.

As we'll talk about in one of the later gaps, we'd also identify the general design criteria and controls needed to meet the ALARA and the ALARP requirements.

So, this is the proposed chart that comes from, originally from Part 70 guidance, that's been expanded to incorporate this notion of a very high consequence and very highly unlikely event.

So, the column and row have been added to that table, and with the likelihoods given as probabilities per year, or frequency per year of an event or event sequence in the ISA.

The previous stakeholder input that was received on this gap comes from a number of sources. The ACRS (Advisory Committed on Reactor Safeguards), and Derek, we're hopeful that you can talk through this some more in our discussion, that NUREG-1909 was in favor of probabilistic assessment methodologies and recommends formulating ALARA requirements that are -- establish design objectives.

The NEI paper September 2010 was in favor of using the ISA with a quantitative assessment of fission produce releases to the member of the public for high consequence events, based on available data. So, that's, I'm sure, one of the topics we're going to talk about, when we talk about more quantitative probabilistic risk assessment methodologies as what data actually is available to achieve those analyses.

The paper that was published by GE in a conference, I believe, also discussed the use of probabilistic or risk assessment methodologies, and again, referenced the need for reliable industry data to conduct those assessments.

The second gap that I'm going to talk about is whether or not and how operators will be licensed under a proposed Part 7x.

The Atomic Energy Act of 1954, as amended,

requires production facilities to have licensed operators. Current regulations in Part 55 are not applicable in whole to operators of reprocessing facilities. Those are related to operators of power reactors.

The NRC staff is developing a framework to establish regulations for licensed operators and the criteria for testing licensed operators.

So, the approach, again, is to make this risk informed and performance based, and so, to apply those risk informed performance based approaches, to determine which personnel, including possibly senior operators, need to be licensed and the requirements for their licensing.

Personnel actions clearly are related to the safety of preventing or mitigating the very high consequence events, will be licensed by the NRC and we will include requirements similar to those in 10 CFR Part 55, to develop a systems approach for training, testing, simulation facilities, re-qualification and roles and responsibilities of licensed operators.

The stakeholder input largely comes from the NEI White Paper and their recommendation is that operators be certified by the facility licensee according to NRC approved program, defining certified

operators for, again, these event sequences which would lead to potential fission product releases to members of the public for the high consequence events.

There is no recommend in the NEI White Paper for a licensing of senior operators.

Gap 9 speaks to the need for general design criteria. If you know the terminology, the general design criteria are these sort of over-reaching criteria that are used to ensure safety and safe operation.

So, NRC establishes these minimum requirements for facilities all of the facilities and applications of licensed radioactive materials, and they're in place to assure that safety, the systems structures importance that are relied on for safety are reliable and will perform their intended safety functions when needed.

I think one of the most important points in this is the second bullet, is that, you know, the general design criteria are in place because of uncertainty, of errors, of unknown, and so, they're there to try to capture additional factors that might not be considered in the standard design.

There needs to be adequate defense and depth, redundancy and diversity and that the balance

of plant -- those parts of the plant that are not considered system structures and importance directly related to safety, but can have an impact on those system structures and -- that are important to safety, that those unanalyzed situations don't negatively impact plant safety.

So, general design criteria, the issue here is don't currently exist for reprocessing facilities.

So, the NRC staff position, in that the details of this are provided in a table in the gap summary. There are 10 categories for general design criteria and the staff have identified 78 potential general design criteria within these 10 categories.

These include confinement, you know, process safety, criticality safety, etcetera, that are shown in this list.

NEI proposed, in their White Paper, 28 general design criteria, and those were largely drawn from the Part 50 nuclear power plant regulations, with some additions from other regulations.

They discuss the need to have thresholds for the applicability of the general criteria. So, those -- the need to have some risk informed on which of those general design criteria would actually apply.

The applicant would have to explain how the general design criteria are used to achieve the performance requirements, and that some general criteria may not be necessary, based on the results of the ISA.

Other stakeholder input that was received was the need to minimize regulatory uncertainty on general design criteria and establish the general design criteria by regulation, not simply by guidance.

I think another very important gap that we discussed is the one-step licensing and inspection and testing acceptance criteria. This is Gap 10.

Currently, there are no regulations for one-step licensing or combine license (COL) for a reprocessing facility. 10 CFR Part 52, which is for new reactors, doesn't apply to spent fuel reprocessing facilities, and the requirements for approval of applications for licensing under 10 CFR 7023 do not address reprocessing facilities.

So, the general NRC position is, the general licensing authority similar to that under Part 52 would be adopted, one-step licensing processing, for reprocessing facilities, including an inspection process, something that is ITAAC or ITAAC-like. I don't want to make -- the NRC was careful to make sure

that we were advocating something that was clearly ITAAC.

This would be to confirm that the facility meets the design, construction and licensing requirements. The process could include the opportunity for early site permitting, that could be referenced in the license, and that there is the potential that we have to reserve areas in the regulation for technology specific requirements and licensing for the different technologies, such as aqueous or electro-chemical reprocessing.

Then NEI White Paper, and then industries other comments on this particular gap, were that they were generally in favor of one-step licensing, but they always wanted to have the proposed 7x regulation include flexibility for either one or two-step licensing process.

The last of the gaps that I'm going to speak to are on technical specifications, and the Atomic Energy Act of 1954, as amended, requires technical specifications for production facilities. 10 CFR Part 70 doesn't require tech specs. It uses the IROF methodology, but the IROFS to address technical specifications in Part 7x may be needed, in order -- because of the higher potential risk of this

kind of a facility.

So, the NRC staff position is to use tech specs to define space safety limits and limiting control settings, limiting conditions of operations and surveillance requirements and design requirements, for the IROFS that address these high consequence or very high consequence accident sequences, and that additional technical specifications may be needed to ensure that safe operation with the bounds of that -- of the safety analysis, as well as other administrative programmatic -- programmatic and technical specifications.

The NEI White Paper recommended tech specifications, again, for this category of events they called high consequence events involving fission product releases to an individual located outside of the controlled area.

There are a number of questions that were provided with these gaps, that are in the handout that was provided, and I didn't go through those in detail. I hope that some of those are part of the discussion on these particular gaps, and that's all I have on the presentation.

MR. CAMERON: Okay, thank you very much. Thanks, John.

What I'm going to suggest is that we go through the discussion in a different order than the gaps were presented, and basically, talk about methodology, GDC and tech specs, because there is an architecture there, relationship, and then when we're done with that, we can talk about the one-step licensing issue and finally, about operator licensing, and of course, as John mentioned, there are questions in the gap paper that the staff prepared, and we can interject those at any time. Does that make sense to everybody?

Okay, well, how about methodology, this issue of the probabilistic risk assessment, the PRA, versus the -- or in combination with the ISA?

I think John did a great job of laying out what the staff position is, and what we've heard from the stakeholders. Let's go to Rod, to lead off on that.

MR. MURRAY: Yes, and I'll start with a question for NRC. The terminology very high consequence event is new to us, and I was wondering if you could walk us through, what was the rationale for -- a two-part question.

What was the rationale for defining a new category of event, number one, and number two, how

dependent is the termination of what events fall into which ones of these categories on PRA, or comprehensive PRA for the whole facility?

MR. CAMERON: And okay, we'll go to Alex. So, two parts, Alex, where did the very high consequence event concept come from, and how does that relate to the methodology issue?

MR. MURRAY: Okay, very good. Well, the staff started looking at what were the differences -- can you hear me all right?

The staff started evaluating the differences between reprocessing facilities and other fuel cycle facilities, and we took note of, from the NEI White Paper, and also, the Advisory Committee letters and the report NUREG-1909, and we noted that there seemed to be all of these, how shall we say, implicit or implied special events, sort of categories, which were above and beyond what are currently considered in Part 70.

In fact, the NEI White Paper actually introduced this category, although it was unnamed, of fission product releases to members of the public, and the staff thought, "Okay, this seems to be introducing a category that was sort of beyond high consequence events," and we just used the term very high

consequence events, realizing that that is a sub-set of high consequence events.

And for that category, it was based upon actual scientific safety, technical differences of the materials and types of operations that were occurring, or might occur, at reprocessing facilities, such as handling fission products, such as handling reactor-grade plutonium, such as handling large quantities of actinide materials, potentially, multiple receptors being involved, etcetera, etcetera.

And based upon the staff analysis, it would seem that this would bring in potential consequences which could be much greater than say, some of the thresholds in Part 70, as they exist right now.

Now, on the flip-side of that, the staff also evaluated and discussed within itself, and evaluated various documents on -- from industry, from the Advisory Committees, from other parts of the NRC, from the general literature, input from members of the public, and concluded that if you do have a category of events which, if you will, have a somewhat higher consequence than high consequence events, this category, this sub-set that we're calling very high consequence events, for want of a better name, that

commensurately, it should have, if you will, more rigorous analysis to demonstrate adequate assurances of safety.

This actually comes directly from some of the correspondence from the Advisory Committee on reactor safeguards, and so, based on that, we concluded it would be necessary to have more rigorous analyses for this -- for these potentially very high consequence events, and that would mean quantitative risk assessment methodologies, such as PRA, and that's how we got there.

MR. CAMERON: Okay, great.

MR. MURRAY: Thank you.

MR. CAMERON: Let's go back to Rod.

MR. McCULLUM: Yes, just a quick clarifier. So, the regulation would envision whenever there is a potential for a fission product release to the public, or very high consequence event, and that definition is useful, that a PRA is required in that event?

MR. CAMERON: Alex, you used the term more rigorous analysis, and I guess the point is, what does that mean?

MR. MURRAY: In general, a more rigorous safety analysis does mean a probabilistic risk

assessment.

At this time, staff is still evaluating, is it solely PRA? Are there other options?

We do have a Commission policy statement, which says that we should use PRA methodology to the greatest extent, practical in all regulatory matters, okay.

So, we're basically following that direction of the Commission, and also, from the Advisory Committee on reactor safeguards, most recently, in the February 2011 letter to the Commission.

MR. McCULLUM: Yes, I think you may want to --

MR. MURRAY: But we're still developing what that really means, do you understand that, and we are seeking guidance from members of the panel and members of the audience here, if they have any elaboration on what that means.

MR. McCULLUM: That's useful. I think we'll want to explore that PRA versus more rigorous safety analysis topic, but I see we have other tents up, so, we'll hold onto that.

MR. CAMERON: Yes, and let's make sure that we do have a discussion on this, but let me check

in with Mary and then Tom, and see what else we should put on the table. Mary?

MS. OLSEN: I like what I heard Alex say. It makes sense to me, but I get really nervous when we start talking about risk informing everything, without having any prescriptive standards that are set, and somebody has to show that that part is going to get met.

I mean, if it's just an envelope that you get to keep pushing around and pushing around and pushing around, and then the public has no access, because these things are "proprietary", and so, then, there has to be all these big agreements signed, and very expensive experts hired.

And so, I'm just going to put in a pitch for something Dr. John Goffman used to talk about, and that they actually do in Canada, which is, you know, if you're going to do this level of regulatory interactions, that you actually fund the interveners, to be able to afford to participate, because otherwise, it's completely a lock-out.

And I think our current administration has an emphasis on transparency, and I hope this agency will continue to have that commitment, as well.

MR. CAMERON: Okay, thanks, Mary. I'm

going to put the intervener funding issue in the parking lot here, and I would just ask the rest of the panel, as you heard Mary's concern about prescriptive requirements, okay, where are they, and as we go along in our discussion and perhaps, Alex, you want to say something about that, right now, let's make sure we address that. Alex?

MR. MURRAY: We do, the NRC staff does believe that there should be some prescriptive requirements. We're not entirely sure of the specific details right now.

Some of these prescriptive requirements we will call general design criteria, and these would be conditions, or situations that the licensee must address, and there is a table in the summary which gives some proposed areas for those general design criteria.

Those areas might actually become general design criteria, in and of themselves. We use the term GDC, for general design criteria. Those are based upon what currently exists in the regulations for handling radiated materials, such as spent nuclear fuel.

MR. CAMERON: Okay. So, the prescriptive requirements are going to be the general design

criteria, is what I'm hearing, and you Yawar, do you want so say something more on this, this prescriptive idea?

MR. FARAZ: Certainly. In addition to the general design criteria, there will be technical specifications and the staff believes that in addition to the tech specs that are based on the safety analysis, there might be additional tech specs that may not have a direct -- show a direct nexus to risk.

Never the less, there -- we would consider them important from a safety standpoint, that they would be included in the technical specifications, which essentially, you know, establish the overall safety envelope, and you might consider it that way, for a reprocessing facility, and as a reminder, the existing fuel cycle facilities are not required to have technical specifications. Our reactors are.

MR. CAMERON: Okay, and we will be -- I think that aides everybody's understanding on this, and we will be getting to the discussion of GDC and tech specs.

Let's hear from Tom and then perhaps, we're going to be going back to the issue that we started with. Tom, then we'll go to John Greeves.

MR. CLEMENTS: Thank you. On the slide on

the screen now for Gap 5, I don't know if will be Alex to respond, or someone from the NRC.

If you could explain why you've put this ALARA/ALARP with a slash, and where in the regulations. We didn't get an explanation yesterday, a good explanation about as low as reasonably achievable.

Where is the as low as reasonably practical coming from? There is -- although I may have problems above these, I think there is a big gap between those two, and why is it kind of an and/or on -- in the presentation, and what is the definition of as low as reasonably practical, in this sense of this gap?

MR. CAMERON: Okay, who wants to address that, and I think it's clear, what Tom's question is. Yawar?

MR. FARAZ: Yes, the reason we added ALARP to the ALARA concept, generally, when you think of ALARA, you think of radiation dose and to reduce the radiation dose as much as possible, primarily for workers.

There are -- existing licensees are required to implement ALARA per 10 CFR Part 20, although here in this -- on the Gap 5, you are talking

about the risk of accidents, and we're discussing, you know.

So, the same kind of philosophy we expect to apply to minimizing risks of accidents. So, you would minimize the risk, as low as possible. We didn't intend to use, you know, existing terminology from regulations and the same kind of philosophy.

So, we just wanted to kind of explain that what we mean is minimize as much as possible, you know, and you might even include, based on some cost benefit type evaluation, but that was the purpose.

MR. CAMERON: And is there -- Tom, is part of your question, what is this concept of as low as reasonably practical?

MR. CLEMENTS: Well, now, another term has been introduced, as low as possible. So, I'm a little confused, as to what the point it.

MR. FARAZ: The term ALARP is used in the UK, very widely. It's as low as reasonably practicable, and it's not so much the terms, the application of the terms, it's the philosophy that we want to explain, that that philosophy would be applied to potential accidents in minimizing the risk of those potential accidents.

MR. CAMERON: So, this term ALARP, as you

called it, is from -- it's not from the United States regulatory philosophy. It's something that's used in the UK, and I guess one of the questions is, is what is the difference, and maybe you hit that.

But what is the difference between ALARA, our concept of ALARA, and this as low as reasonably practicable, and I know Alex is --

MR. CLEMENTS: Well, I think you mentioned cost benefit. I'm not sure if there is anywhere in the regs, that cost benefit analysis on a licensing proceeding is part of the licensing.

MR. CAMERON: Okay, let's go to Dennis. Dennis Damon.

DR. DAMON: It's not in the regulations. It's in the Atomic Energy Act. It's in the statute, okay.

The words are -- well, actually, it is in the regulation, because it was imported into the regulation. It's in 70.22, okay. The words are, "The Commission is authorized to set standards, to minimize danger to life and property," okay, that's the concept. It's the same thing as ALARP, only what -- the distinction we're trying to make here is ALARA is a terminology from Part 20, which has to do with planned exposures and effluence, that kind of thing.

ALARP is a broader concept. It involves minimizing risk from accidents, as well as routine releases.

MR. CAMERON: Okay, thanks, Dennis. Alex, do you want to add anything onto that?

MR. MURRAY: If I could, please, just a very quick comment, and we can let someone respond.

The concept, in all of the NRC regulations, and it would carry over into any proposed regulation on reprocessing facilities, is that not only do licensees have to meet the requirements, if you will, the limits, if you will, that are in regulations, but they also have to look and go beyond those limits, such as to use the term from Atomic Energy Act, minimize risks to the lowest extent practical.

Okay, we use terms which are in the Atomic Energy Act, and carried over into our regulations, as low as reasonably achievable. As Yawar and Dennis pointed out, those usually are more in the context of planned or routine exposures. The term ALARP is a term that we're considering from the United Kingdom's regulatory structure, which brings in more of the context of unplanned or accidental conditions, i.e., don't just meet the limit, go beyond it, and by

beyond, I mean, below the limit, as much as you reasonably can.

MR. CAMERON: so, the same philosophy?

MR. MURRAY: Yes.

MR. CAMERON: Okay, just applied to different things, and you're going to --

MR. MURRAY: Yes.

MR. CAMERON: We're going to go to the presenter.

MR. MURRAY: May I just add one last thing? As part of the discussion this morning, we appreciate any input that the members of the panel, the members of the audience might have, as to how we would define ALARA and ALARP, in the context of potential regulations for reprocessing facilities.

MR. CAMERON: Okay, and let's hear from John, and then let's see what the panel -- we'll go to Rod, and see what the panel has to say about that. John?

MR. STAMATAKOS: Yes, Tom, the analogous -- I think an analogous approach is the SAMA approach, that's used in reactors. This is severe action mitigation analysis. That's a cost -- that includes a cost benefit, and has a cost benefit component to it, as well.

So, that philosophy, I think, is embedded here.

MR. CAMERON: Okay, thanks, John. Rod?

MR. McCULLUM: John Greeves has had his tent up for a while. I think he's got a lot of expertise on this, and I'd like to hear what he has to say first, and then I'll comment.

MR. CAMERON: Well, I just want to make sure that we close out the ALARA/ALARP.

MR. McCULLUM: Yes.

MR. CAMERON: And I thought his point was on something.

MR. McCULLUM: Yes, briefly on this --

MR. GREEVES: Yes, a problem we didn't close out earlier, yes, you're correct, but I'd say something about ALARP, too.

MR. CAMERON: Okay, do we -- well, if you have something on the --

MR. McCULLUM: I'll say very quickly that I am concerned that reprocessing would be the only type of facility in the United States where we would define this term.

I think we have ways of assuring, and this goes back to the ISA, maybe this will link to John's discussion. You know, we certainly want to assure

that items relied on for safety will function. We certain want a high level of control there, and we certainly want to make sure that's reflected in the regulations.

But I think it only becomes confusing if this new definition of safety comes into play, that only exists in this type of facility, not lower hazard facility or not high hazard.

Let's use the terminology we already have, for assuring that systems function and -- as opposed to introducing a new --

MR. CAMERON: So, do you think that -- you think that what we have now can be used to achieve the same objective that the staff is concerned about, and that the use of a new term, that doesn't have any rich history, I'll use John's phrase from yesterday, rich history here may be problematic and counter-productive?

MR. McCULLUM: Exactly, because we -- the history of assuring that systems that are important to safety work, we have that, and if we stick with that terminology, all the folks that design these things and operate these things, they know exactly what to expect.

MR. CAMERON: Okay, and I think you know,

the reason for Tom's question and confusion is because we're -- where did this come from?

Let's go to John and then to Sven. John?

MR. GREEVES: Yes, just to finish on the second item, I really want to go back to the first item, then.

ALARA has been addressed by the Part 70 people for a long time. I would ask you, don't introduce new terminology. You're going to get these kinds of questions from people, what is a lab, etcetera? This kind of discussion is going to happen.

The Commission has done ALARA for a long time, and Part 70 and Part 20 and Part 40 and Part 30. It's not new. There are ways to do that.

What I raise my tent on was the discussion that Alex went through, on the ISA/PRA piece, and this is very complicated and I frankly, think there is going to be more meetings on this, rightfully so, rightfully so.

Surprised to see you introduce a new concept, very high consequence events. Two points.

I'm sympathetic with what Mary Olsen said earlier. You introduce this new concept, another layer in two dimensions, and it is going to be very difficult for the stakeholders to follow this. It's a

point.

We've been working on ISA's and edging toward PRA for a long time. The staff has done these Part 70 reviews. I don't see the need for a new category. It's just, how do you implement the approach you've used in the past?

The NEI White Paper acknowledged that for events that could be risk offsite, that you should move towards quantitative approach, in those cases.

I don't think it requires defining another level, and it's going to -- if you do that, it's going to induce a level of complexity that will make it less transparent, and I think there is a lot more we're going to have to talk about this process. But I'm surprised and concerned about additional prescriptive layers in this process.

The Commission has urged the staff to use risk informed performance based approaches, and not to add prescriptiveness to this process.

So, I think it's going to take a lot of dialog, to get there, but the NEI White Paper acknowledged, in those cases, where you do bump up against the current standards of high consequence event, that using quantitative techniques is something that should be pursued. So, I'll stop.

MR. CAMERON: So, John, your concern with this is similar to the concern that Rod expressed, with ALARP, that the existing framework can accomplish, can meet the concern that the staff is trying to address, but the introduction of a new term can only create confusion and as you noted, less transparency. Is that it?

MR. GREEVES: That's certainly part, and I think Alex understands what I'm saying, that the terms that you have, the approach that you have, can achieve the same ends, and it's just a question of how do you introduce the PRA concepts, when needed?

MR. CAMERON: And before we go to Alex and Yawar, let's hear from some -- from Sven and Mary and then, have the NRC staff jump in, and then go to Rod. Sven?

MR. BADER: I'm a safety analyst at heart, and what perplexes me here is, if we're going to stick with the term IROFS, and then go with this ALARA/ALARP and PRA approaches, I'm not sure how you're going to come up with IROFS, other than designating everything in a facility IROFS.

The majority of the facilities are designed with the ALARA concepts. So, you know, if we're going to have to apply these to facilitating

some of these events, we're talking about significant number of IROFS, and I think one of the complaints I've heard in the past about some of the Part 70 facilities is they have too many IROFS, that makes inspections hard to do.

So, you know, I just want you to understand that from a safety analyst standpoint, if I have to apply the PRA, which goes through a rigorous assessment of facility crediting all portions of that facility, you know, I see Alex is flapping his hand, so, clearly, he wants to address this. So, I'll stop there.

MR. CAMERON: Yes, it's a nervous habit. For those of us who are not familiar with this, can you just explain what IROFS are and what that acronym stands for?

MR. BADER: Items relied on for safety, and so, those are essentially your most important items that you're protecting -- that are protecting you against the hazards in the facility.

You know, and with this concept of very high consequences, I wonder if our IROFS now become doubly important in those cases, versus the IROFS that are necessary for worker protection.

MR. CAMERON: And so, that your point is,

is that with this ALARP concept, that IROFS -- that the concept of IROFS is going to lose its viability, because everything is going to be an IROF, okay, and I want to get Mary on, before we go to the NRC staff, and then we have Rod and Derek. Mary?

MS. OLSEN: Yes, I don't mind agreeing with anybody at this table, but I just want to clarify that these very high consequence events don't necessarily translate into prescription, nor do they necessarily make probabilistic risk assessment more -- you know, less transparent.

So, I just want to clarify that my own views weren't be reflected in a previous comment about possible agreement, because quite frankly, I think that you should have a prescription about how high your sea wall is, if you're in a high earthquake area, and we have seen the consequences of not having, you know, very big IROF met, and so, yes, I really think there needs to be prescriptive things.

On the other hand, I'm really happy to hear that maybe somebody is recognizing that a really high consequence events needs to be a little bit more weighted than that ten to the minus, however many zeros you put on it, because you think you're just never going to see if in your lifetime. I mean,

that's that old joke about, what was his name, got hit by a meteor, when Three Mile Island happened? You know, that was the big probabilistic -- first probabilistic risk assessment guy. I'm forgetting his name. But you know, that was the joke, he got hit by a meteor.

So, I think both things are tremendously important, that we weight certain factors in a risk assessment differently, and that there are some prescriptive levels that just -- you look at the situation and you go, "Oh my God, how could they put the diesel generators so low down on that site?"

MR. CAMERON: Okay, and Mary is talking again, about prescriptive, and I think as we go through our discussion of general design criteria and tech specs, I mean, you hear Mary's concern, and I think that in your knowledge around the table, you can address those concerns, as we have the discussion on that.

Now, let's go to Alex and then, you don't want to -- let's go to Alex, and then let's go to Rod and Derek. Alex?

MR. MURRAY: Yes, I heard several times, Part 70 was mentioned. I just first want to clarify that reprocessing facilities are not regulated under

Part 70. They are currently regulated under Part 50, okay.

So, they are different from the fuel cycle facilities in Part 70. In some of the slides here, in some of the discussions in the summary, some of these differences are pointed out. I mentioned some of them previously. I'll just repeat a couple of them, right now.

You do have the presence of fission products, okay. These give high gamma fields. They are a potential hazard for both workers and members of the public.

You do have the presence of reactor-grade plutonium, okay, which presents more inhalation and direct dose hazards, okay. Fundamentally different, okay.

You also have the presence, or potential presence of greater quantities and types of other actinides, americium, curium, neptunium, okay. All of these have much higher dose conversion factors and potential health consequences, which translate, of course, ultimately, we use the term hazards in the NRC, and these hazards are different above and beyond what currently exists at Part 70 facilities, okay.

So, please understand, these are

fundamental, technical safety differences. In the staff's discussions and analyses, based on what we have reviewed from previous meetings and discussions, on NRC documents, on industry documents and multiple sources, other regulators overseas, the Department of Energy, we've done an exhaustive look and have listened to a lot of people. These differences are real and any potential or proposed new regulation for reprocessing facilities needs to accommodate and address those fundamental hazard differences.

Okay, now, the staff also recognizes that the Part 70 approach, where we're bringing in risk informed performance based has some merit, okay, and that's why if you look at that matrix, that was presented by John, about 15 minutes ago, and it's in the summary handout that Tom is looking at right now, okay, it builds upon the Part 70 concept and says, "Hey, let's risk inform this extra category, in order to address these different and potentially greater hazards from reprocessing," okay, and make sure that the regulatory approach ultimately, for a reprocessing facility, will come about and bring adequate assurances of safety.

Yes, if you have something that is potentially more hazardous, we need to look at it more

thoroughly and address the hazards.

Now, the questions which the staff has is, how do you do that? Okay, we have come up with one approach, based on previous discussions, that builds upon the NEI approach. It builds on the Department of Energy approaches. We're open to more input.

So, please discuss it with that frame in mind. Thank you very much.

MR. CAMERON: Okay, and Rod, do you mind if I go to Derek first, because I think there may be something is says that --

MR. McCULLUM: Yes, just be warned that the more these people talk, the more things I think of to say.

MR. CAMERON: But you know, the one thing that that would -- I think the NRC staff should address, you heard a concern from Rod, you heard a concern from John, about one -- one, about ALARP and two, about the very high consequence event.

This concern that introducing the new concept doesn't add to the safety, but could add to the complexity and confusion, and certainly, that's something the NRC would have to take into account, in terms of, you know, its regulatory philosophy on this.

You may want to respond to that, that

concern, those concerns, at some point. Derek?

MR. WIDMAYER: Yes, I also agree with John and others, about introducing the concept of ALARP.

MR. GREEVES: Which John do you agree with?

MR. WIDMAYER: All of the John's. This John, okay, as far as introducing the new topic, and that's all I have to say on that.

The rest of my comments would tend to, I think, change the course of the conversation. So, I don't know if Rod actually wants to go ahead first, and then —-

MR. CAMERON: Okay, let's -- thank you. Thank you, Derek. Let's go to Rod, and then we'll come back.

MR. McCULLUM: Yes, I think this a great discussion and I appreciate the fact that staff is still open to input, and I understand that in the NEI White Paper, we talked about the role of ISA and there may be some -- I think we see them as fairly limited instances, where PRA might be useful.

I think there is a couple of concepts that need to be clarified here. I think a couple of areas where it's confused.

There seems to be, and I'm kind of

thinking quantitatively here, seeing equations in my head, there seems to be an equal sign being put between level of rigor and quantitativeness and level of control.

I don't think that equation works, and also, you know, there seems to be an idea that the level of hazard should drive the level of quantitativeness, or the need for a PRA, and in reality, it is the function of the system, the way the system works, that drives the utility of a PRA, whether you can even do one.

I think, you know, a PRA is -- or an ISA is sufficiently rigorous, if it identifies the items relied on for safety, and the designers can design those items, appropriately, to mitigate the risk that's being dealt with.

Mary brought up an excellent example with the sea wall. Your ISA would identify the sea wall as an IROF, if you were in an area where a tsunami was credible. You would bring in a level of quantitativeness, because you'd have historical data that would tell you what the probability of what sort of a tsunami was, and I would admit, in the recent event in Fukushima, they simply missed that one by a lot, and that's not good.

But that doesn't drive the need for a PRA, number one, and also, a PRA for a sea wall is not possible. Remember what PRA ties to. It comes from a reactor world where you have a number of inter-related systems that prevent a core damage accident.

What PRA lets you do is figure out which ones of those systems are important, or how important, in mitigating or preventing the possibility of a core damage accident.

So, you know, this pump has to function. This valve has to open. This system has to have power from this system, and that system can't get in the way of this system, you know. That is why a PRA becomes necessary.

In a reprocessing facility, you don't have this chain of inter-related systems, that stand between you and a core damage accident. You don't have that level of complexity. You, in fact, can better achieve safety, with an integrated safety analysis. You identify the IROFS. It can be a fairly straight forward process, as is the example of the sea wall.

And once you do that, it becomes a question of designing the IROFS to meet that intended function, so that you do assure safety.

A more quantitative analysis won't necessarily get you there, and so, really, it has to be driven by how the system functions, not by the level of hazard, and just being more quantitative. If you throw a quantitative analysis, in some instances, a PRA won't even be meaningful, but it makes the safety analysis harder for everybody to understand, and you get a number that is not meaningful.

You don't have the data. You don't have the system interactions that are being described. You just have something that you would have had anyway, had you just designed the IROF to the appropriate standards, to assure its function in the appropriate events.

So, I'll summarize, I know Chip wants me to summarize here, it's let's think about what is needed, given the way the system works, to assure safety in the most straight line path possible, as opposed to adding initial -- additional concepts and jumping too far.

We have a greater need to assure safety, so, we have to be more complex, and introduce new terms and be more quantitative.

That's not the straight line path to safety, that we really need to best protect the public

here.

MR. CAMERON: Okay, thanks, Rod. I think that is a very useful caution, and I would, you know, look to all of you around the table, about whether it is a useful caution.

But the caution is, is that increased quantitative analysis, even if you could do it, but that doesn't necessarily equate to more safety.

MR. McCULLUM: Well said.

MR. CAMERON: Okay. Before we go to Dennis and the rest of the cards, let's hear from Susan.

MR. CORBETT: I just want to say briefly, as speaking for the public, I welcome this break-out, these additional break-outs. I think the public wants to know the details of a very highly unlikely high consequence event, and that according to what it says that, you know, the presence and processing of large qualities of fission products and transuranic isotopes has the potential to greatly increase consequences far above the 10 CFR Part 70 high consequence thresholds.

I think the public wants to see the worse case scenario, and we want to be able to ask questions about that, and I welcome the additional break-outs, just as a member of the public.

MR. CAMERON: And that's something, I think that all of you should think about, too, in terms of Susan's statement about the public would like to see this. Think about how -- what you would say to that, in terms of assurance to the public.

Let's go to Dennis and then, to Yawar and then, let's come back and see where Derek was going to take us, and also, talk to John.

DR. DAMON: I thought I'd clarify something for those, unlike the members of the staff here that have been in fuel cycle for a long time. We know what the regulations say, and why you go -- you really do need a very high consequence event, and it's very risk informed, okay.

The highest consequence threshold for radiation exposure of a member of the public, in the Part 70 rule, which doesn't apply, but we're thinking of have a 70x that does, is 25 rem, exceeding 25 rem. That's a pretty modest dose.

There is at least two break-points in health effects above that, that are much more serious. One is 100 rads, where you get into acute radiation syndrome, which is a very severe health effect.

So, 100 to 350 rads, you're talking about very sick people, you know, hair falling out, you

know, nausea, fever, all that kind of stuff.

Then you go above 350 rads, you're talking about life threatening, okay. In the chemical consequence criteria that are in the current rule, we follow the EPA's acute exposure guideline levels that define health effects in terms of qualitative levels, and they go for workers, all the way to life threatening.

We don't have an analogous thing for a member of the public in the current rule. We have two other break points above 25 rem, that give very radically different health effects, and consequently, the staff believes that for those events, we want greater assurance that the protective measures are adequate, and I might address what Rod was talking about, the difference between reactors and reprocessing and the complex control systems and PRA.

It's not the complex control systems that I, personally, am concerned about. It's external events, earthquakes, tsunamis, flooding, what else is there? It's that kind of thing that we want a greater quantitative assurance, that the plant has been designed to resist the most severe events that can occur, and that's the mistake the Japanese made.

They quantified the magnitude of the

earthquake and tsunami, that they thought could occur on the thrust fault, and I don't know how they did I, because I was able, by a cursory review of megathrust events, that they go to magnitude 9, and you shouldn't have assumed that they could only go to whatever they assumed. It was like an 8.2 or something.

You know, a thrust fault of that size can produce a 9. They blew it, okay, and consequently, they didn't make a big enough sea wall, okay. That is what we want. We want you guys to do a better job of quantifying things, and that includes -- it's not the likelihood, and what's the probability of failure of this control or that control. It's the consequences.

We want to know what the doses are, the source terms and the releases of radioactive material, just as is said in the NEI White Paper.

We got these fission products and actinides that can theoretically produce these larger doses. We want to know will they, in fact, produce these larger doses and what are you going to do, to provide greater assurance than just preventing high consequence events, because the current rule was designed for the facilities that existed at the time the rule was promulgated, which was the year 2000, and we didn't have a MOX facility, and we didn't envision

reprocessing.

So, the rule didn't really include consequence categories appropriate for that kind of facility.

MR. CAMERON: Let me just get Rod.

MR. McCULLUM: Yes, I could -- I'd actually like to agree with what -- one key thing that Dennis said, which is that we should quantify the probabilities of external events.

I mean, once your ISA has identified the sea wall as an IROF, then you need to figure out what the probability of what tsunami hitting that sea wall is, and that's exactly the point.

That doesn't mean you want to do -- or even, it's useful to try to do a PRA to identify the sea wall as being needed.

So, yes, absolutely, we should be identifying the probabilities of tornadoes, earthquakes, floods, and we should design against very low probability events, when the protection of public health and safety is involved.

Now, as far as defining it as a very high consequence event, Dennis talked about, you know, some pretty interesting, he called them break points.

You know, we're going to start at a much

lower level, or in other words, a much higher level of public health and safety protection. You're not going to wait until you're getting to those break points.

You're going to identify IROFS, in order to prevent events that could have -- could trigger EPA's protective action guidelines, which are much lower, you know, you're talking one rem. I mean, so, you're going to design against any event that could have a public consequence well below the thresholds that we're talking about for these very high consequence events, and again, adding the extra layer of complexity, beyond quantifying what events you need to be worried about, I'm still going to design a sea wall, just as well, I mean, because at the lower threshold, the more protective threshold, I think is the best way to say it.

MR. CAMERON: Okay, this is a good discussion. Let's go to Derek and John, Kevin, Tom, and then come back to Yawar and Sven, and let's see, let's maybe finish this discussion and go to GDC, with those tents, or the progeny of those tents, if you know what I mean. Derek?

MR. WIDMAYER: Okay, the introduction to the session began with John, and he -- that John over there, and he talked about an ACNW&M (Advisory

Committee on Nuclear Waste and Materials) report, and I happen to have that with me, if anybody wants to get the citations and everything.

This actually -- your slide said it was from the ACRS. It's actually not. It's from the ACNW&M and the ACNW&M has been absorbed into the ACRS.

First of all, I want to caveat that I'm here representing the staff of the ACRS. I don't represent the Committee. Even if a Committee member was here, he wouldn't be representing the Committee.

I did do some homework, as far as the session was concerned, and the -- you know, the best reference to use at this point it time is the ACRS's most recent letter, which was February 2011, as far as what their feelings are on ISA versus PRA.

That having been said, there are some members of the Committee that, you know, feel like PRA is what should be done, you know, for -- a full PRA should be done for reactors.

Now, you can get into a long conversation about what that means, but there are -- you know, the members of the Committee are a little less comfortable with the notion of an ISA, although they're beginning to understand it a little bit better.

With those caveats, you know, I thought that the hybrid approach was something that you could potentially explore and bring to the Committee. They certainly would want some step in the process to look like a PRA, because what they're interested in is, you know, prioritizing the risks for inspection and not having the 10,300 whatever IROFS that you had at the MOX facility, without also continuing the process and figuring out which ones are more risk significant.

So, you know, I don't think they object to starting with an ISA and moving to a PRA. I think the best probably -- you know, that kind of hybrid approach would probably work.

One suggestion that I did want to bring forward was, I didn't -- an approach where you eliminate the low risk stuff first, I think is also a useful exercise to try to get to, you know, to the extent that an ISA does add -- I'm not an ISA or a PRA person, but if you did some sort of process where you said, "Okay, we've got a whole bunch of these things that we can eliminate first, because they're insignificant to the risk," and then go to the more quantitative analysis, where you prioritize things, I think is, you know, kind of like where they might be headed, as far as bringing in a hybrid approach to

them.

MR. McCULLUM: I know I'm not an attorney, I just want to say amen.

MR. CAMERON: Okay, do you want to also say amen? No? Let me get you on here, and then we're going to go to John Greeves and Kevin and Tom, and then come back to Yawar and Sven. John Stamatakos.

MR. STAMATAKOS: Yes, Rod, just as a response, as to what you talked about, you know, with the sea wall, or the -- you know, designing against an extreme event.

One of the disadvantages of that approach, without looking at the entire event sequence, I mean, you may have a low sea wall, but there may be other parts of that event sequence that, you know, you have to have gas diesels that are below grade.

You have to have -- there is a sequence of events that led to that accident, not just the fact that the sea wall was too low.

But the other point I want to make, in adding a quantified approach, for those large consequence events is that they allow much better incorporation of their uncertainty.

So, you might say that that tsunami was a one in 10,000 year tsunami, or one in 100,000 year

tsunami, but there is a huge uncertainty to that number.

And so, you know, by incorporating some better risk analysis into that, you're also allowing to incorporate what that uncertainty of that probability is. The same thing is true, you know, with earthquake ground motions.

You know, you might have the one in 2,500 year ground motion that might, for this area, might be -- have a PGA of .2 or .3g, but there is a huge uncertainty on that value, and you want to be able to incorporate that uncertainty into the analysis, as well as what you think the mean or the median value is.

MR. McCULLUM: Yes, I just want to agree with that, and indicate that I think you can do that with ISA, in most cases, and my experts have their tents up, so, I'll let them go.

MR. CAMERON: So, I guess that's the question. Let's go to John and then over to Kevin and then back over to Tom.

MR. GREEVES: Alex, I'm listening very carefully to what you're saying here this morning, and you're stressing look more thoroughly, and we recognize that, when we put the NEI White Paper

together, and stressed that there are times when you do need to look more thoroughly.

So, the system that we recommended, you can, in fact, and should do that. That's the intention, is to look more thoroughly.

You make a point about 7x not being a Part 70 facility. Well, having fission products and these other radionuclides is not unique to 7x. There is lots of facilities that have fission products, Part 60 facilities, 61 facilities, 72, Part 30. There is lots of facilities. It is not new, to have fission products.

So, and so, I just -- in cautioning against coming up with new terminology, we've seen earlier what happens when you do that. I would say that the system you have extended, when appropriate, to use probabilistic techniques, is user friendly and can, I think, be transparent.

You're going to have the same problem that was mentioned here earlier, on inspection. You're going to try and separate out what's important, in terms of where you put your inspection resources, which again, I think is user friendly, for extending this quantitative approach along the lines in the NEI recommendations, and not coming up with, you know, new

techniques.

Some of the speakers were identifying that they want to see what the worse case scenarios are. You can actually do that, with those techniques, and show what, you know -- we can show the whole spectrum.

But I don't think you need to come up with a new category to do that.

MR. CAMERON: And John's point about uncertainty, can that also be taken into account?

MR. GREEVES: When you get into these quantitative techniques, you have to evaluate uncertainty. You don't have to conclude that the tails of the distribution are what you have to regulate by. You don't regulate by tails of distributions.

But when you go into these quantitative techniques, you should be filling -- fully showing that uncertainty, and the sequence of scenarios, that would have to be done.

MR. CAMERON: Okay.

MR. WIDMAYER: If I could just add, that would be another reason, that would be another thing that the Committee would say was an advantage to using the PRA, as its treatment of uncertainty.

You know, the notion that you have

difficulty with the methodology because data doesn't exist for something like that, this approach allows you to determine and examine the uncertainty, and understand, you know, what the, you know, faults of the data and stuff mean, and helping you with your prioritization.

MR. CAMERON: Okay.

MR. GREEVES: I would just add that --

MR. CAMERON: Thank you.

MR. GREEVES: -- you wouldn't regulate with the tails of those distributions, okay.

MR. CAMERON: Thanks, John. We're going to go to Kevin and Tom, and then come back up front. Kevin Strickland, State of South Carolina.

MR. STRICKLAND: From an agreement state -- standpoint, of course, when we look at a facility like this, that's NRC licensed, you know, everything is about containment and confinement.

So, of course, when you're talking about a reprocessing facility, of course, you have fission products at other facilities too, but the quantities of them, and the magnitude of the levels is certainly greater.

So, therefore, speaking from a regulatory standpoint, and an agreement state, we would certainly

like to see the higher risk with additional measures taken to ensure that you didn't have a problem.

MR. CAMERON: Okay, thank you. Thank you, Kevin. Tom?

MR. CLEMENTS: I had just a brief comment and another question.

I appreciate the discussion about uncertainty. I think the ball game has changed, in the aftermath of Fukushima, where we've seen that a -- if a spent fuel pool accident was ten to the minus six, two accidents at the same time, I don't know, ten to the 9^{th}, three, ten to the 12^{th}, ten to the 15^{th} for four in a row.

So, I think that the uncertainty with those accidents is going to be instructive for how the NRC takes into account events that all of the sudden, become from ten to the minus 15^{th} to ten to the zero, in a matter of hours.

So, I think the NRC -- it's incumbent upon the NRC to be more cautious in its approach with determining the uncertainty. I'll leave it at that.

And I had a question about one of these charts and the term you used here, and I want to raise again, because I do think that Savannah River Site is probably the prime suspect for a reprocessing plant,

and in NRC terms and what you have on this chart on page 19, individuals outside controlled area, getting back to the Savannah River Site, again.

Can I hear from the NRC, now, or how would you approach this, as you develop the regulations? Do you -- would you create a separate class of exposed individuals, outside the controlled area, who would be DOE workers, or are DOE workers part of the general public? Thank you.

MR. CAMERON: Yawar, can you answer that, and then make the point you were going to make? We'll just go to you, now, if you understand Tom's question?

MR. FARAZ: Yes, I do. I think I do. Someone who is not trained to respond to certain events, whether he be an employee of the DOE or another employee, or from another company that's nearby or a resident, nearby resident, if that person is not trained appropriately to respond to certain events or accidents, then we would obviously identify that person as a member of the public, or at the same level. That person needs to be protected at the same level as a member of the public.

So, that's the assumption that goes into what we consider this class of person.

Now, that person is a trained employee.

He knows what to do, how to respond, because a lot of the fuel cycle events, you do have time, and there is a certain procedure that you can follow, to mitigate the consequences, and if that person is trained, then yes, it could be considered as a worker.

So, it all depends on what the training level is for that individual.

MR. CLEMENTS: Could I follow up?

MR. CAMERON: Go ahead, Tom.

MR. CLEMENTS: Maybe this was changing the discussion a little bit from before, but in an event of x-consequence, whatever it is, on a site such as Savannah River Site, where an adjacent facility may be impacted, which could set off a chain of events that could have larger consequences, how are you going to take into account, the presence of other facilities nearby that may have fission products, transuranics, plutonium, plutonium processing? How is that going to enter into your determination of consequence of events?

MS. OLSEN: Like Votgle.

MR. CAMERON: Again, this is a hypothetical.

MR. CLEMENTS: Well, perhaps, not so hypothetical if the industry is looking at Savannah

River Site, but there is a MOX plant nearby, where there is a very high consequence event, or even lower, how are you going to take this?

MR. FARAZ: Yes, hopefully, I can explain this, for an example. It's similar, a similar situation.

The NRC regulates radioactivity, radioactive material, and often, these facilities have chemicals, you know, lots of chemicals present, as well. For onsite chemical hazards, it's primarily OSHA. For offsite, it's EPA.

Now, we have an MOU with OSHA, where by if a chemical event, a purely chemical event occurs onsite, and it affects the radiological safety onsite, then the NRC would be responsible for that event, and the licensee -- and that event would be addressed, a pure chemical event would be addressed, would need to be addressed in the ISA.

So, they would have to have appropriate IROFS, to make sure that that event is appropriately prevented or mitigated.

So, I hope that similar kind of situation, that kind of explains, you know, your concern.

MR. CAMERON: And let's let Alex also, go to Tom's concern, and then let's go to the rest of the

tents, and I think we need to start our discussion of general design criteria, before we go to a break.

Okay, Alex, this is on Tom's point, okay.

MR. MURRAY: Thank you very much. I'd just like to build on Tom's question and points, and Yawar's discussion.

First off, Tom was asking about basically, a DOE site worker, and the terminology that is usually used, that is called a co-located worker.

The NRC Commission has already set policy on that. I believe the SECY was in 1998. I don't remember the exact number for the SECY, but it can be found, and in very simple terms, basically, it's exactly what Yawar said.

It depends on the level of training. If other workers on that site, outside of the NRC facility are not trained, in basically, the hazards that exist at that facility, they would be considered to be members of the general public and criteria, dose-wise, accident-wise, would - that would apply to those workers, those other co-located workers, to use that term, would be those criteria for members of the public.

And it's very well discussed in the SECY. It points out that often, on these very large DOE

sites, people who are DOE workers include non-radiation workers. They also include visitors to the site, which would, under all normal conditions, be considered members of the public, like mailmen, forestry workers, FedEx people, HVAC fixer-uppers, local contractors, etcetera.

Now, just to build upon Yawar's point about, if you will, co-located -- I'll say NRC facilities near each other, in the safety analyses for those respective facilities, they would have to consider accidents at the other facility as external events and analyze them, and this is a general approach the NRC has, whether it's a Part 50 facility, a Part 70 facility, a proposed Part 7x facility, go through the entire numbers in the NRC Code of Federal Regulations.

But if another facility can have an external event that impacts that one licensed facility, it has to be addressed, in the safety analysis, and that is well documented in many, I'll say both regulatory aspects and guidance documents in the NRC. Thank you.

MR. CAMERON: And thanks, Alex, and on this particular point, Tom, if you and Alex and Yawar could -- if you need to talk more about this, do this,

you know, offline, perhaps, so that we can move on with this discussion, and I think Yawar is going to kind of put some questions before all of you.

So, let's go to Sven, right now, and then we'll hear from Yawar.

MR. BADER: Okay, you know, what Alex put out there is absolutely the right position, you know, the ISA is a continuous process. So, even if DOE were to build something nearby, the ISA process would require us to evaluate that.

So, DOE would have similar activity going the opposite direction. So, but -- and I'm not sure I'm going to take us off course, but I have a question regarding the slide that's not up there right now, but there is certain likelihoods that were proposed up there, that were associated with these very high likely and highly unlikely.

And I guess my questions are, you know, are there plants that put that into the regulation? Will you be putting ten to the minus six for very highly unlikely, or ten to the minus five, for highly unlikely, or is this going to be something that the licensee will establish, like Part 70 allows you to do?

The reason I ask you that is because there

is not much difference between 10 to the minus six and 10 to the minus 5th, unless you're dealing with national phenomena, where there is clearly significant jumps in the probabilities there, in the risks.

So, that's a question I wanted to ask.

MR. CAMERON: And Yawar, you want to put some questions forward, but can you respond? Are you the appropriate person to respond to what Sven just asked?

MR. FARAZ: And I would probably defer to Dennis Damon, because I think he might be in a better position to --

MR. CAMERON: Dennis, do you want to try to give us an answer?

MR. DAMON: Yes, I might mention what was, what the rationale was. There's a thing, when we promulgated the Part 70 Rule for the existing fuel cycle facilities, there's a thing that goes along with the rules, called Statement of Consideration.

And it discusses why the Commission chose not to specify a definition for highly unlikely and unlikely, in the Rule, and left it to the Licensees.

And it had, go to the Statments of Consideration for the Part 70 Rule that came out in 2000, and it will discuss it.

The rationale went along the lines of the diversity among the facilities that we were applying the rule to. In this case, we wouldn't necessarily have that impediment.

So I'd have to say the rationale is a little different. You'd be dealing, especially if you were clear that you were dealing with a, you know, liquid standard type of reprocessing plant, you wouldn't have that impediment. Now, you do have the impediment, that nobody has ever done on quantitative risk assessment that we have access to a facility like that.

But the rationale was the diversity and the difference in the number of sequences that would exist in plants. So they left a lot of flexibility to the Licensees to define how they're going to deal with that issue.

MR. CAMERON: Okay, thanks, thank you, Dennis. Yawar, what's bugging you, so to speak?

MR. FARAZ: I think, you know, I really appreciate these discussions, they are very good. However, just one thing I wanted to point out is that we're talking about accident sequences, individual, the discussion is primarily based on an individual accident sequence level.

Which is good. But then there are other questions that you have on Page 17, of the handout, and they all elude to the total risk or the risk to a member of the public from, you know, the entire facility.

You know, the gamut of accident sequences that are potential at that facility. So, I think if we can maybe discuss that before going to the next topic. As well as, there's another point that I'd like to get input on. It's the prioritization of the IROFS, is something that we've also added to the list of items that you would consider.

And if there's any input on that, I think we'd really appreciate it.

MR. CAMERON: Is that last one on prioritization of the IROFS, does that fit into the text fact discussion, or does it flow from this methodology issue? I'm just trying to --

MR. FARAZ: I think it flows with the methodology issue. It's something that we would like an Applicant to provide in his application. I'm not sure if the stakeholders have considered that or if they're prepared to discuss it.

MR. CAMERON: Okay, well, let's --

MR. FARAZ: But any input would be good.

MR. CAMERON: Two issues that Yawar would like to get some input from people on. And Rod, I know you had your tent up, but could you also talk to those two questions?

MR. MCCULLUM: I might be able to, but I did want to go way back to what Tom said earlier. He was raising the question, and I think it's a good question, of the impact of an event at one nuclear facility on another nuclear facility.

And, I just want to say, that I think the answer she got in the context of existing regulations were correct, but I do want to say that is an important question.

MR. CAMERON: Oh, you're mic is off.

MR. MCCULLUM: I didn't just say anything, I guess, officially.

(Laughter.)

MR. MCCULLUM: I just wanted to comment on, Tom made a very important point. He raised the issue of the effect of an event at one nuclear facility on another nuclear facility.

And certainly that's something, that as Yawar said, we do address. However, I would point out, and I would caution NRC, as you go through this process, that something is being considered on a scale

that's much bigger than this regulation, with respect to Fukushima event.

Where you had multiple events in multiple facilities and they did have an effect on each other. So there's always a need to pay attention to what's going on with the overall NRC task forces and how that might affect, you know.

Not just to think of it in terms of what might exist on Savannah River. With regard to prioritization of IROFS, I think, and I'll go back to Derek's discussion that I said amen to there.

That's really where the additional quantitativeness and PRA does come into play, if you can do it. If you have the data and the type of system where PRA is useful.

Clearly identifying 382 IROFS and treating them all the same is not a very focused approach to ensuring safety. In the hybrid approach and again I can't say this as well as Derek said it.

That's where the additional quantitativeness comes in. Is it saying priorities. You use ISA as your foundation to identify your IROFS, and then where you can you look at the uncertainties and the relative importance with the quantitative methods.

That to us, and I think that's what we meant in our white paper, the more recent white paper, that's where that white paper approach and the hybrid approach come together.

So I think we've got good input on that. And what was the other thing you wanted input on?

MR. CAMERON: The total risk limit?

MR. MCCULLUM: I'm going to defer to Sven on that one, he fortunately just put his card up. I think, yeah, I'll defer.

MR. CAMERON: Okay, well let's go, Derek, do you want to say anything on these two points that Yawar asked?

MR.WIDMAYER: No, but, Rod, I was going to jump in and kind of repeat what I said before that Rod said. The Committee is thinking that the PRA analysis type of thing is where you'd be able to prioritize the IROFS.

MR. CAMERON: Okay, good, thank you. Let's hear from Sven and then Mary, and then we really need to go to GDCs, although we've been traipsing around it. So, Sven.

MR. BADER: I'll kind of throw it back at you. When you say prioritization of IROFS, are you talking about actually what's coming out of PRA and

ISA, or are we talking about prioritization relative to personnel, public versus worker?

MR. FARAZ: For some of the current, well, some of the applications that had come in, under Part 70, we don't have a requirement to have them, the Applicants to prioritize IROFS.

So when the time came to inspect the facilities, you know, after the license was issued, there was a need for the NRC to know which IROFS to inspect to pay more attention to.

And so the NRC internally developed a prioritization scheme. It wasn't based on a PRA. It was based on several criteria, several factors we considered and, based on those, we determined which IROFS tend to be more important than the others.

For example, the ventilation, if a ventilation system is an IROFS and it applies to several accident sequences, it might be more important to make sure that that ventilation system is, you know, pay more attention to the ventilation system, as opposed to a single IROFS that's only applicable to one accident sequence.

So, there were several factors that went in and we came up with that scheme. We felt that if the Applicant goes through and does this

prioritization as for the application, not only would it help the NRC, obviously the NRC would review, would conduct the same kind of review that it does for the application, on the prioritization.

But it would help the NRC in its safety review as well as in conducting the inspections. And then we also felt that it would, since the Applicant or the Operator, in operating facilities, in applying margin measures to those IROFS.

That was the purpose of that.

MR. CAMERON: Sven, total risk and/or prioritization.

MR. BADER: Let me go to prioritization. Because I think the way I understood what you just told me, is that it's based on the number of events that rely on a safety system, an IROF, as opposed to the receptor, or the consequence of the event, is that right?

MR. FARAZ: That was just one factor.

MR. BADER: That was one factor, okay, all right. And that's the way I would pose it, if you're going to do a prioritization scheme there's going to be a lot of factors involved.

You'll find for a facility, a reprocessing facility, that there's going to be a lot of

protections for facility workers, people that are actually in the facility, so most of your shaky systems will be devoted to them.

And, you know, our projects which had thought about prioritizing and that fact that this is protecting someone who is paid well, and understands the hazards that they're working with, to prioritize those IROFS at a lower level, but it just doesn't fly.

So, we didn't go through those prioritization processes. You know, we are doing, there are PRA approaches that are not in licensing requirements, but you do PRA to look at your risks, and you compare risks to one another.

And we think that's the appropriate way to prioritize things. But we're not suggesting that the PRA be a licensing basis to do prioritization of IROFS, but I'm not sure, are we talking about making prioritization of IROFS part of the licensing basis?

MR. FARAZ: Yes, the staff kind of discussed, you know, Gap 5, as part of the discussions. We felt that it would be way beneficial, from a safety standpoint, for an Applicant to prioritize its IROFS based on its important to safety.

And so, you know, that's based on past NRC experience with other applications. So we felt that

for reprocessing facility that can be done. That would really, that would benefit our licensing review.

It would make it more efficient and effective. And not only the NRC's licensing review, but also its inspections as well as the Operators application of margin measures to those IROFS. So, that's a current feeling and we just want your input or your response to that. How you felt about it.

MR. CAMERON: And, Sven, anything on total risk? I hate to keep bringing it back and we're going to go to Mary and then we're going to go on.

MR. BADER: You know, I don't exactly know what total risk means. You know, I see the question here and if you want to sum all the numbers from a PRA approach, that will give you a total risk.

You know, an ISA approach is not going to give you means to sum something up and give you a total risk, and I don't know if that's what you're looking for.

MR. CAMERON: So this, the concept of total risk is, it's problematic in the sense that you're not really sure what it means?

MR. BADER: I mean, are we talking something like core damage frequency?

MR. CAMERON: Yes, I think, that's why I

punted as well. When there's no core damage frequency where there's no core damage event. Again, remember, we're not at a reactor, we're not a fuel cycle facility.

It's hard for us, it doesn't compute really.

MR. DAMON: Let me take a shot at it. What, there's two different concepts.

MR. CAMERON: You want to press your green button.

MR. DAMON: It is. Let me take a shot. The one I'm concerned about is the fact of, the workers in a facility like this are really not in a risk position that's that dissimilar from currently facilities.

But the public is. And the reason is we have this large radioactivity inventory. So this is all in principle. It may mean practice these consequence levels may not be actually occur due to the nature of the accidents.

But in principle you've got the radioactive inventory there. You can expose a member of the off-site public to a high radiation dose. Okay, that member of the public, presumably a resident, is exposed to all accidents that could cause

a release that could achieve those dose levels.

So you have to add them all up. That's what I mean by total. You sum up all of the sequences that effect that individual. So it's an individual risk evaluation. Which, in principle, is what was done for reactors.

The difference being, reactors basically only have one scenario, a large release of radioactive material. A facility like this might have others, but it's really a very similar concept.

In reactors they can use large, early release frequency. You could, in fact, define an analogous concept for a reprocessing plant with respect to the radiological risk.

MR. CAMERON: Okay, thanks, Dennis. And we're going to go to Mary. At least we got some discussion of total risk. We're going to go to Mary now for final comment on this Gap, and then we're going to jump into GDC and see how far we get and then take a break. Mary.

MS. OLSEN: I actually wanted the slide that was up before, with the chart, but speaking to the question of the risk goal for worker and member of the public, I think NRC should be extraordinarily able to explain why they would regulate risk and protection

differently for anybody impacted by any different type of facility.

Why would somebody living near a reactor have more or less protection, than somebody living near a reprocessing facility? That's the kind of question you're going to have to answer. If you don't, just say yes.

So, I recommend that you grapple with that, and I wanted the risk slide because in a real incredibly interesting moment in time, in 1990, the Commission, and I don't know how many people that work at NRC actually know this.

But in the policy statement for the expanded BRC policy, below regulatory concern, the prospective deregulation of radioactive waste, they actually printed a risk assessment for radiation.

Now I'm not endorsing it, I don't happen to agree with that risk assessment, but you would have to make a very high, for the individual I think, death, you know, that's a pretty high consequence.

And it would be 35 in 10,000, because it was 3.5 and 1,000, and this is at 100 millirems a year for a 70-year lifetime. So it's not a single event of 100 millirems, it's the ongoing legal limit level.

But 3.5 in 1,000 or 35 in 10,000, is right

up there in your top tier for a VHCE, very high consequence event, for an individual.

So I'm just bringing that forward to the fact that you have a pretty low bar already.

MR. CAMERON: Thank you, Mary. Let's go to the GDC slide and, as John pointed out in his presentation, the staff has ten categories, 78 potential GDC.

We heard that the NEI white paper or discussion from NEI, also addressed GDC and so let's, Rod, good one to open a discussion on this.

MR. MCCULLUM: Yes, I'll open it and hopefully make it a short, provide something to help make it a short discussion. We are not, industry is not prepared today to comment on all 78 of these general design criteria.

We only saw this a couple of weeks ago. I will say that the approach of identifying categories and within those categories, identifying specific criteria of sound.

So I think NRC, I don't want to slow down the process here. I think NRC has an approach that it can use to inform its decisions to go onto the next steps and recommendations to the Commission.

But certainly the topic of GDC should be

the subject of very detailed interactions where all the right folks, stakeholders and industry, around the table.

And when I say all the right folks, this is an area where the subject of technology and neutrality really comes to a head.

You know, we've got AREVA at the table here today. I've got Westinghouse in the audience. GE wanted to be here but they couldn't make it. We need to make sure, from a technology and neutral standpoint, that all the various technologies, CV, GEC, is covering the type of facility they might intend to build.

So I guess what I'd say, in brief, is as a placeholder to move forward, you know, good job NRC but we definitely want to, you know, we want to have a very detailed discussion with all the right players in terms of, between the 23 that were in NEI white paper and the 78 you've got.

And are those all the right ones? That's a specific meeting. And I just simply want to say let's, you know, as you move forward, later in the year, let's have that meeting.

MR. CAMERON: That's a process suggestion, I put it in the parking lot day. A discussion

specifically on the GDC, because it's going to be a pretty detailed, involved discussion that's going to be necessary. Alex.

MR. MURRAY: Yes, thank you very, Rod, we greatly appreciate that. I just want to add two things. First off, in the staff review to date, the staff has not found any technology-specific GDCs or so forth.

I should really rephrase it. GDCs that would be specific to a certain type of technology. We're not 100 percent certain that will completely be the case, but so far we do believe we can do GDCs that are technology neutral.

MR. CAMERON: Alex, you believe that the GDCs that the NRC has proposed, would cover all of the potential technologies, I think that was Rod's concern?

MR. MURRAY: That is correct. I also wanted to clarify, we are still looking at developing specific GDCs, however the table that's in the summary on, what page is it? Twenty-six, these are areas or issues which need to be addressed by GDCs.

They're not necessarily specific GDCs, themselves, we think many will ultimately translate into specific, general design criteria. But there are

right now areas which seem to need a specific GDC.

MR. MCCULLUM: Yes, I agree, Alex, and I think you're probably right, I just think that we need to test what you've said with a detailed discussion and look forward to having that.

MR. CAMERON: Okay, Derek.

MR.WIDMAYER: I think that's a sound approach, I think that's good. And as far as Number 3, the question that you had and the notion that these are just areas that may acquire a GDC, they were asking whether they could rely on existing requirements.

And, you know, of course, I think that's a yes. That it's just, that's a process that they can go through in these meetings and these discussions to say, okay, you know there's already existing criteria at 20.1304 or whatever.

We'll just cite that, and we don't need a general design criteria that makes them do something specific to meet that. So, you know, I think that's a sound approach.

MR. CAMERON: Okay, and as we've mentioned before, the GDC starts to take us down the road to address Mary's concern about prescriptive requirements, correct?

MR.WIDMAYER: Yes, but I think, you know, there's more to it than just the general design criteria.

MR. CAMERON: Sure, sure.

MR.WIDMAYER: But that's step one.

MR. CAMERON: Anybody else on general design criteria at this point? Susan, do you --

MS. CORBETT: I'm just curious, I mean I understand that there are many different kinds of reprocessing, different techniques, different processes. And probably some that we don't know about yet.

And how can you like a one size fits all if we don't, I mean, shouldn't the design and all the rules have, really be specifically around the different kinds of processes, because they all have different outcomes and different potentials and different risk and different waste streams and all kinds of different things.

I'm not sure of a one size, how can we do a one size fits all?

MR. CAMERON: I think that that's a concern I had, in terms of whether this total framework is understood. Can someone explain, give us a brief view of how all of this works together.

With the GDC, the tech specs or these IROFS, in other words, Rod was talking about GDC, making sure it covers all technologies. Well, Susan's concern is, is where do you get specific requirements for a particular technology? So, Rod, can you talk to that?

MR. MCCULLUM: Yes, I think Susan is absolutely correct, a one size fits all approach you won't get to. I don't think that means you need to keep having a different regulation every time you have a different technology.

I think, and that's a little bit about what Alex was talking about. The goal here is to define the GDC in a way that you can apply them to multiple technologies.

And the way each technology would meet the GDC, would be very different. And that's where it goes across from what the NRC requires and to what the Applicant does to meet the NRC's requirement.

For example, I mean I'm just, this is the first one that my eyes landed on, you know, I see Number 45, under radiation protection and shielding.

Now, that's going to be a criteria for an aqueous process and for an electro-mechanical process, or whatever processes we don't know about.

The design of the shielding, the areas where you're going to place the shielding. The analysis of what systems need to be shielded and why. That's all going to be very different and I think you can specify a regulation that requires that criteria be met.

And then do it in a way that each Applicant can demonstrate how their technology meets the criteria. But again, that's why we need the detailed discussion.

MR. CAMERON: So that's how the specific, the specific requirements for a particular technology come in, the GDC is set and then for the particular technology that License Applicant is going to have to show how that particular technology meets that general design criteria.

MS. CORBETT: I'm just concerned that you're going to dictate the kind of process that's going to be used by the criteria. You might, there might be other processes that are better or more safe or whatever.

But because of the criteria that you establish, you're making this more difficult to be used or something. I'm just worried about, you know.

MR. CAMERON: That's --

MR. MCCULLUM: But we are, too.

MR. CAMERON: -- an interesting and philosophical question, too.

MR. MCCULLUM: That's exactly our concern. And I want, and it almost comes down to a question of economics. And that's why I want all the technologies represented in this detailed discussion of general design criteria.

Because if some of them see, hey, this advantages me or, you know, maybe there's a different criteria that is more reflected. But I really want to, I think you've expressed a valid concern and I would hope you'd participate in the more detailed interactions that would explore that.

Because we do need to make sure that we fairly cover all the possible technologies.

MR. CAMERON: I think Susan's point goes further than that. And the NRC might want to address this. I think Susan is saying how can you ensure that the safest technology is going to be used? And it maybe harder for some technologies to meet the general design criteria, but the NRC doesn't tell reactor, potential reactor Licensees that they have to use a certain type of reactor.

They have to meet the requirements. But

is it clear what Susan's concern is? The NRC is not deciding what is the safest technology to use. And I don't know if anybody from the NRC, just wants to say anything else to that, because I think that's a pretty fundamental concern that people in the public might have. Yawar, do you want to take it?

MR. FARAZ: I think that it will definitely be a challenge to establish the general design criteria for reprocessing facilities.

If you look at the design criteria for reactors, they tend to be fairly specific in Part 50. And that's because the design is well known.

We know there are PWRs and VWRs, it's fairly constant. In fuel cycle the designs vary. The facilities are very different. One, even the fuel fabrication facilities tend to be very different amongst themselves.

But if you go the Part 70, the general design criteria are very general. There are essentially statements. You shall make sure that to prevent explosion, something is addressed at a very high level.

So definitely it will be a challenge to, without knowing a specific design, to come out with general design criteria for reprocessing facilities.

But for the ones that we know of, you know, it's primarily aqueous and bio-processing or electrochemical.

So, with those in mind, we have a good understanding of what those technologies involve. And so we'll try to establish the GDCs based on those two technologies.

And, with this in mind, that there might be future technologies that might come up later on and make sure that those general design criteria can be extended to those future technologies.

MR. CAMERON: Anybody else on Susan's concern?

MR. MURRAY: Yes, if I could, Chip, please?

MR. CAMERON: Yes, go ahead, Alex.

MR. MURRAY: This is Alex Murray again. I've been quiet for too long. I should have a little hour glass every five minutes.

MR. CAMERON: Not that there aren't benefits.

MR. MURRAY: I think it's important to everyone at the table and in the audience, to keep in mind that the two aspects to NRC regulations. Such as general design criteria.

There would be a specific criteria that is referenced or mentioned in the regulation. Okay, it may be at a more higher level. Okay, the Applicant has to meet that and has to show how they meet that general design criteria.

In guidance documents, and that criteria most likely or most ideally, would be phrased as technology, in a technology-neutral way. And I'll give an example in a second.

In supporting guidance documents, perhaps a standard review plan. Perhaps a regulatory guide, we're not sure yet. We would expound upon that and give examples of what the staff of the NRC would expect to see and it might be down to a specific technology levels.

Now, let me just give an example and maybe this will help clarify, examples are always good for clarification. We have a potential general assigned criteria or issue an area which we call confinement/containment design.

It's number 13. The general design criteria might read in the regulation something to the effect that the Licensee shall prescribe the design and safety parameters for the confinement or containment system that is used at their facility to

demonstrate that potentially hazardous radio nuclides or other hazardous materials do not effect workers or members of the public.

Okay, for an approach that is, say using aqueous technology, okay, that design might consist of negative pressures, you know, what sort of pressure differentials the staff would expect to see.

And these might be in the regulatory guide or guidance. Some draft numbers might be presented. It might be different pressure zones, as you go from no to less to potentially more contamination areas.

We would expect to see a greater, how should I say, differential pressures, more filters, more layers of protection, to use that terminology.

For an electrochemical technology in our guidance we might point out that this would point out what inert gases are used. How they are maintained and purified. What levels of oxygen ingress allowable.

What levels of oxygen should be specified, etcetera, etcetera. Okay, just to give you a specific example.

MR. CAMERON: Okay, thanks, Alex. Derek and then Jim.

MR.WIDMAYER: Well, Alex did a good job

there as far as explaining that there is this hierarchy that NRC uses. I mean the tech specifications is where you really get to where the rubber meets the road.

You know, for a particular plant, a nuclear power plant, a Westinghouse power plant, for example, the NRC has a NUREG document that 380 pages long.

The give the standard specifications for a Westinghouse plant and then each individual Westinghouse plant that's actually operating, has their own technical specifications which show, you know, on a specific piece of machinery, what the numbers are supposed to say.

And when it deviates from those numbers, what actions are supposed to be taken. So they will bill down from the general design criteria all the way to tech specifications for all those kind of hazards that he was talking about.

You know, what the, how the machinery is supposed to operate. NRC actually doesn't do this, the Applicant does it and then NRC understands how the Applicant is going to do it.

And reviews it and agrees to what the approach the Applicant is going to take. It is a

challenge to know whether you've got all the right general design criteria.

One of the things that I thought of, when we were talking about this, was this kind of relates a little bit to whether you allow one or two step licensing process.

MR. CAMERON: We'll bring that up when we get, after the break, when we get to that. But, also thanks for the segue to tech specs, when we get there to, explaining the relationship between general design criteria and tech specs.

Let's go to Jim and then see what Yawar has to say, and then maybe we're ready for a break. I think we are ready for a break. Go ahead, Jim.

MR. BRESEE: My comments also are directed at the issue that Susan raised and that Rod discussed. The fact that we need some additional roundtable discussions with the appropriate people.

Specifically, let me consider what may come out of some of the advanced R&D activities currently underway. I think the most likely areas of impact would be changes in head end and waste processing, associated with rather standard separations technologies. But, on the other hand, do not rule out the possibility, even in the near term,

that volatility processes, room temperature ionic liquids.

There are a host of other potential activities, which don't fit neatly within the categories of what might be called conventional separations.

And there I would use PUREX or variations thereon, and perhaps electrochemical.

MR. CAMERON: Thank you, Jim. Let's go to Mark and then finished up with Yawar. Mark.

MR. YEAGER: I kind of agree with Rod's initial comment that this issue probably requires its own meeting, because we are dealing with very different technologies, and the fact that this meeting that we're having now is with regard to commercial, you know, proposed commercial reprocessing that would happen outside of a DOE facility.

So, of concern to us is an agreement state, the siting process naturally would be controversial for us because we would be players in a commercial scenario.

So I think it's important for the opportunity for community and state regulator comment when the process, if a process or a proposal for a commercial facility in whatever state occurs, to

ensure the transparency and to discuss this specific technology, rather it be aqueous or whatever, that's going to be applied.

I was kind of reviewing Table 1 here, and just the specific numbers. And I could probably make an argument for every single one of them, that the state would have a concern with, with regard to their mission to protect public health.

But the ones that immediately jumped out at me were, for example, Item 8, which proximity or co-location with other nuclear facilities. With us that would probably be nuclear laundry, you know, facilities that might be supporting activities at proposed facility that would be licensed by agreement state.

One of the things that Mary pointed out at the beginning, is we do have historical, a historical track record, although it never was implemented.

One of the things at West Valley and the AGNES facility in Barnwell County, is each one of them had a low level waste site co-located within them.

Barnwell, a lot of people don't realize that was the reason why Barnwell was created, was to support activities potentially at AGNES. So, as a regulator, when you're applying ALARA, Tom, one of the

things you want to do is minimize exposure and that includes your workers.

So, having low level waste sitting around your facility, is not ideal to fill that, you know, to make sure that philosophy is met. So you would want a convenient way to dispose of waste as quickly as possible.

Especially if you have other waste that doesn't have an avenue for disposal, and it has to be stored. You're going to want to minimize your source term.

So that would be a concern to us because I don't see how a proposed commercial facility could be sited without the company considering that potential to not only create the processing facility, but also the facilities that would support it.

The other items are Item 10. I won't go into details on each one, but the ones that jumped out at me is a state regulator with 10, 13, 14, 48, F-1 Monitoring Control, that goes back to the discussion yesterday.

In this case, EPA needs to be your partner, your regulatory partner in this part. Because, again, there is a disconnect between the dose, the dose limits to the public between NRC and

EPA.

So, that's a concern, and continues to be a concern for us. Forty-nine, again waste management. I won't belabor that. Fifty-five equipment, or I'm sorry, shipping and receiving.

That's the transportation element which would effect local governments, local communities, anything with, based on the decades of experience we've had at Barnwell, I can't tell you how many times we've had, you know, concerned citizen reports about shipments with placards on it.

And they are perfectly fine there. They're within every, they're compliant, but it's a factor, that increased impact on the community, just from again a psychological aspect.

There will be increased traffic, increased potential for incidents. And even though the transportation conveyances are very robust and there's practically no possibility that they could be breached, and that's a historical fact.

Six years of type B casks, no incidence of a release. They're still going to create public concern and they're going to create the need for additional facility, you know, the facility operator is going to have to be more proactive to the emergency

response community.

That's an additional expense that needs to be factored in, in the planning, if this is proposed. Sixty-nine, spent nuclear fuel and radioactive waste storage.

Spent nuclear fuel, NRC's issue, radioactive waste storage. Again, that can become an ALARA concern eventually to the workers. Because you can only store so much, and I think every commercial reactor has that concern.

Which is why they are all so happy that WCS in Texas has opened its facility to be B and C waste. Seventy, waste forum.

Again, I brought this topic up yesterday. Based on the technology that will be applied, there might be mixed waste issues, as an agreement state. We've regulated facilities that have done bent scale research with radioactive materials.

And had basically orphan mixed waste, because there is no avenue to dispose of it. So we babysat orphan waste and it had to be licensed and just, we would visit it every time we had to do a license inspection.

We'd go, okay, it's time to visit the mixed waste, just to make sure it was properly

secured. It's a waste forums that concern to us.

Seventy-six, the decommissioning inventory limitations. How much are you going to be willing to store or do you want to do what they have to do at nuclear power plants now?

Stack it. There's criticality concerns. Again, if there's no avenue for ultimate disposal. And, again, it is policy, it's something that NRC has to seriously discuss with the Blue Ribbon Commission.

There has to be an avenue created. I think it's a good idea to have these regulations in place, so when we do get things sorted out, that there is a clear path forward and you don't have to, you know, immediately rush this process.

But, again, there are a lot of things that aren't regulatory, they're policy, and those have to be addressed. And then finally, decommissioning.

We, somehow, it was before I actually joined the Department. Somehow we got the license for the AGNES facility. And we went through decommissioning or de-licensing plan down there.

And, again, there's a lot of historical information that would be of value. And I know NRC has gotten information from every avenue that they could to research this topic. But, again, there is a

historical path, even though these facilities were never used.

And there's a lot of lessons to be learned and archived data that exists on decommissioning and what happened and, you know, the good things and the bad things.

So that could actually contribute to your ability to come up with a robust general design criteria. And that's pretty much all I had.

MR. CAMERON: Thank you, Mark, for those specifics. We're going to hear from Yawar and then finish up with Susan, take a break to 20 after 11:00, come back and run to about 12:15. Hopefully that will give us a chance to cover tech specs and one-step.

I don't know if we'll get to Operator licensing, but, at least that's my sort of plan. Yawar.

MR. FARAZ: Yes, I just wanted to respond to one aspect that Mark brought up, before I get into the overall how safety is applied to reprocessing. And that was EPA and NRC requirements.

NRC's 10 CFR Part 20, actually requires all Licensees to meet 40 CFR Part 190 limits. And we expect that requirement to also apply to reprocessing. Concerning safety, I think that was, Chip, that you

had brought before.

Clearly, the safety analysis forms a basis for safety of a facility. That's the baseline. The safety analysis then, what it does is it identified areas that need to be addressed by tech specs.

In addition, tech specs would have other tech specs that I have discussed before, that may not have a direct nexus to some of the accidents, but have some relationship to overall safety, and that would also be included in tech specs.

Then, in addition to the tech specs, you have these general design criteria that John Stamatakos had pointed out in the list of bullets.

A really important bullet was these areas, these unknowns or things that may have been, not necessarily overlooked, but not quite addressed appropriately in the safety analysis report, in the safety analysis.

So that general design criteria require a baseline or that, you know, buildings and structures be built and at a higher level of quality than what you have, what you typically see.

So, this is how you essentially ensure overall safety of a facility. And I think it's a very, I could think of it as layers of protection.

So you have the safety analysis and you have the tech specs that implements the safety analysis. And then in addition to that you have general design criteria.

And, in addition to that, we have, you know, Licensed Operators and other safety requirements. There are several ways or several layers that we are applying and we expect to apply to reprocessing facilities.

MR. CAMERON: Okay, thanks for that overview Yawar. Susan.

MS. CORBETT: I just wanted to thank Mr. Yeager for presenting very well concerns that the public of South Carolina would have about such a facility being located here.

And I'd just like to add, I'm sure it's buried in here, but I think we would also, in South Carolina, be very concerned about water usage. And I'm sure that's under, in here somewhere, but design criteria should take into effect, in a world of diminishing water resources, the fact that many places are very concerned.

And there's been numerous fights, as we saw with our water bill this past year. There's a lot of concern about water usage in our state from

industry.

The other thing that we would be concerned about is decommissioning. What would be left on the site? What will we get stuck with if it's brought here.

I don't think that a reprocessing plant has ever been successfully decommissioned anywhere and cleaned up. I mean, all we have to look at is West Valley and, what's the other one, I can't remember, Morris.

And that didn't really operate, did it. But you know, there's not a lot of experience in this and so we, as South Carolinians, would want to make sure that, you know, what are we going to get stuck with in a decommissioning process and is there the money to truly clean it up when it's all said and done.

MR. CAMERON: Okay, thank you. And the water usage issue is a very interesting one in terms of how that plays out in the regulatory framework. And maybe, quickly, when we come back, before we get into tech specs, and we've been talking a lot about tech specs or mentioning them.

So maybe, I'm not sure how big a discussion that will be, but maybe the NRC could talk

about, well how does, how does the water usage issue in licensing of a reprocessing facility, how is that covered?

We know in reactors there has to be a certain, there's some safety considerations there. We know in the environmental impact statement on a facility that water usage is looked at generally, but it may be useful for Susan and others to just have a little discussion of that, when we come back.

But, why don't we come back, you know, I have about three minutes to 11:00. Can we come back at quarter after, and then we'll devote an hour to the rest of it and only take 15 minutes out of lunch. Thank you.

(Whereupon, the proceedings went off the record at 10:57 a.m. and came back on at 11:20 a.m.)

MR. CAMERON: I wanted to, just real briefly, to finish off the water quantity, the water availability issue. And I'm just going to say a couple of things as a facilitator to just set this up, and if what I say is incorrect, okay, I would hope that the staff would -- they'll be very quick to say, that's not true, Chip, so why am I worried about this?

But with reactors, as I understand it, there is a tech spec, there's a trigger in the tech

spec that relates to water availability because it has a safety implication.

I don't know whether there would be a similar trigger for reprocessing facility, but outside of that, water availability is discussed in the Environmental Impact Statement on the facility.

Now, the NRC could, perhaps, and this is a legal issue, the NRC could set a mitigating license condition related to water availability. But the issue is there, if it's not related to an Atomic Energy Act responsibility, as opposed to a responsibility under the National Environmental Policy Act, the Commission, the staff is reluctant to do those mitigating licensing conditions. Okay?

But I just wanted to see if we could give Susan some knowledge about what is a very big concern here, and here is not just Georgia, but South Carolina.

Do you want to ask anything more?

MS. CORBETT: Well, I just -- I feel stupid arguing for the industry here --

(Laughter.)

-- but it seems like, if you --

MR. CAMERON: Well, wait a minute. Everybody should pay attention.

MS. CORBETT: You want to back up a step. You don't want to wait. You don't want to wait until you've got this design approved that uses a lot of water and then try to find a location where there is. You might want to go back to the very beginning and make sure the design criteria is one that assumes has a world of diminishing water supplies.

MR. CAMERON: And is that where the siting GDC category comes in, Derek?

MR. WIDMAYER: I think we have two different things going on. One is, I think, that it would be appropriate in general design criteria or someplace that, you know, depending on the needs of the facility, you would want to site it someplace where there's adequate water supply, and of course -- okay, but alternatively, there's a whole nother process that this facility is going to go through.

And I don't know what it's like. And it's usually state-specific, local-specific, which is you're going to -- this facility's going to have to get a water usage permit to use the water.

And that's where I think your concern would be addressed as to, you know, how much this facility is going to use the water that needs to be used for other things, and whether it's appropriate

for it to be sited where it's being sited.

So, that's something, actually, where NRC would not be involved much at all, is getting the water --

MR. CAMERON: Except for the Environmental Impact Study.

MR. WIDMAYER: Right, EIS, yes.

MR. CAMERON: But that might not result in a specific regulatory requirement.

MR. WIDMAYER: Not from the NRC, but it would from whoever's in charge of water permitting in the local community.

MR. CAMERON: Perhaps.

MR. WIDMAYER: Yes.

MR. CAMERON: Alex, more on water, and then we'll go to tech specs?

MR. MURRAY: Yes. I think it's a very good point. I think it is addressed -- I would like to say it is completely addressed, but I think that's something the staff has to check on, as Derek was just saying, that basically, the three, if you will, regulatory areas, which should address it, but I cannot guarantee they would, and we'd have to check.

The first area has to do with the safety review, specifically, the General Design Criteria. We

do, the staff, in its draft position, we do think there should be a General Design Criteria related to the site and the site parameters and how they match the plant design. All right?

In our discussions, we have not explicitly discussed water usage/limitations, though discussions about arid versus wet sites have come up in the context of water availability, okay?

How it would come out in a General Design Criteria at this time, we do not know. Okay? We just have flagged the issues and had discussions on the issues.

Second part in the NRC process, licensing process, we do require an environmental report from the applicant, and the NRC subsequently prepares an -- most likely, an Environmental Impact Statement for a facility of this type. And in that, water usage issues, the impact of a facility including water usage does have to be addressed.

And the third is just what Derek was alluding to, there are local authorities. Sometimes in some areas, it's the local government, other areas, it's more at the state level, and they would have to provide permits to the facility.

And as part of that permitting process,

the appropriate water usage versus availability has to be resolved.

MR. CAMERON: Okay. Thank you.

And thanks for bringing that up, Susan.

And we're going to go to tech specs. Yawar and others have already given -- and Derek have given us a great segue in terms of how tech specs fit into this whole licensing framework.

And I should say this now, before I forget, and it's an administrative issue. Jim Bresee is taking the 6:00 plane tonight, and he has a taxi ordered, but if anybody is also taking that flight that's driving, if you could give Jim a ride. Or you're welcome to share his taxi.

(Off-mic comments.)

Okay, great, well you guys -- you don't need to raise your cards or anything.

(Laughter.)

You can just talk to each other offline, okay? And here's another one.

MR. GREEVES: I'm catching an earlier cab.

(Laughter.)

So if anybody's headed for the airport mid-afternoon, please let me know.

MR. CAMERON: Okay.

MR. GREEVES: Cabs are expensive around here.

MR. CAMERON: I don't know, now, I'm confused.

MR. GREEVES: This is a gap -- next time, make the hotel near the airport, please.

MR. CAMERON: Well, we could have been in Columbia, okay?

Any rate, tech specs, I always look at Rod to sort of give us a tee up on these things, but Rod is not here.

What do we want to know, NRC, about tech specs? What does anybody want to say about tech specs?

MR. WIDMAYER: I was kind of interested in Rod also, because, you know, I mean, I think that's the way to go.

I think that's -- we talked about it already, and I think that's what we would be doing, and I think the approach the NRC's proposing is sound. So I'm kind of curious as to how the industry feels about it, and --

MR. CAMERON: Is there a controversy over the use of tech specs? And do we call them now, or -- these are not the IROFS, right? Okay.

So what needs to be -- what needs to be throttled out in terms of the tech spec issue? Is it like the more specific discussion on a GDC meeting, because a lot of the details have to be hammered out?

Yawar, what do we want to talk about here?

MR. FARAZ: I think the tech specs, the area of tech specs is a fairly straightforward issue. They're required by the Atomic Energy Act for reprocessing -- for production facilities, which a reprocessing facility would be. So the question of whether to have them or not is not there. You know, they will be there.

We identified a couple of questions on tech specs. First of all, we tried to explain our general philosophy on how the tech specs would be structured. If you want, I could maybe talk about an example of a tech spec. I don't know if that will help.

MR. CAMERON: Well, why don't you do that, just so everybody knows how that works and can see how it relates to everything else.

MR. FARAZ: Okay. Okay. When an applicant does a safety analysis, they would identify certain, you know, accident sequences which we're calling a subset of the high consequence accident

sequences, as very high consequence accident sequences.

For these very high consequence accident sequences, we're proposing that the applicant have specific technical specifications. Now, what the technical specification has, they have several items, a safety limit that, if exceeded, you know, there's no guarantee that the accident won't occur.

So you want to establish a safety limit. Let's say it's a temperature limit of 300 degrees. Beyond 300 degrees, there's no guarantee that the accident will not occur, so that's the upper limit.

Then, they would have another operating limit, or they may have more than one operating limit. They may have a limiting control setting, where the item that is measuring the temperature, the temperature gauge, would sound an alarm that may be set at 50 degrees, so, that would alert the operator that this accident can occur, or you could exceed the safety limit at a later time.

Now, the technical specification, what it would do is, it would say, okay, it would first of all specify these limits, and then it would also identify the actions that are needed to be taken to make sure that the safety limit is not exceeded.

So, it will say, the operator has to turn on a safety system, or actuate a safety system within a certain amount of time. Maybe, you know, within one minute, the operator has to turn on a actuator safety system, or shut down the operation. And so it's a very systematic way of making sure that the safety limit doesn't get exceeded.

In addition to those actions that are required, there are also surveillance requirements that would be needed that would be specified in the tech spec for the IROFS that are involved.

How often is often enough? Maybe you need to ensure the availability and reliability of a certain IROFS. Maybe you need to surveil it once a month, and that would be based on the safety analysis, or maybe it's once in six months.

But, you know, so that's the overall structure. In addition to these specific tech specs, we may also have additional tech specs that I talked about before, such as, you know, administrative limits, and some other things that may not have a direct nexus to the very high consequence accident sequence.

But we think that those are important from a safety standpoint to ensure that the safety envelope

for the reprocessing facility is maintained.

MR. CAMERON: Okay. And for Rod's benefit, we started out with, there's no controversy about whether there should be tech specs. Is there a discussion like the meeting -- specific discussion on the General Design Criteria needed to go into details of tech specs?

And then Yawar gave us an example of how tech specs work. I don't know if you want to add -- do you want to add anything on the whole tech spec issue?

MR. MCCULLUM: Well, yes. Basically, our position is is that the tech specs should be derived from the safety analysis.

And I think going back to it, without repeating some of the previous discussion, that is why the safety analysis needs to be as straightforward as possible. It think you saw that as a consistent theme in our discussion.

It's also important that the tech specs and the -- I think what we're going to talk about next, the operating licensing, that those be consistent, and I think because there is a level of complexity in the safety analysis methodology prescribed in your technical basis and there is some

inconsistency.

I think you've got the operator licensing is based on very high consequence events. The tech specs are based on high consequence events.

So, in our view, operator licensing and tech specs should be equivalent. It's when you have a tech spec operation that you need to license an operator.

There's one statement I wanted to refer to, and let me get to it in the rationale for the tech specs, if I can find it here. Page 31, okay. And that's on the old one.

27? Okay, yes. Sorry. No, that's not -- yes. Waste incidental to reprocessing on the old one. Now, I'm lost in the document.

But anyway, there was a tech spec -- there was a statement in there that said something along the lines of, tech specs where operations are similar to those of reactors, and if that was the case, you would have little to no tech specs.

So, again, coming up with a coherent safety analysis basis for both the tech specs and operator licensing, that's what we're interested in seeing coming out of this.

MR. CAMERON: Okay. And actually, after

this, I wanted to make sure that before we went out to the public and broke for lunch that we had started our discussion of the one-step licensing, so we may go to that next.

And maybe there's not much to be said more than the consistency issue that you raised on operator licensing, but we do have time to do all that.

I just want to make sure that we get everything out now that we need to on the tech spec issue.

And Susan, we'll go to you, and then Derek.

Susan?

MS. CORBETT: Well, on the end of page 31, you ask topics for public feedback, and the paragraph right before that, you say, "In addition, because reprocessing processes would involve large quantities of highly radioactive and other hazardous material, the NRC staff considers it reasonable to establish in the case of power reactors general tech specs that may not necessarily trip the very high consequence accident sequence criteria, but would still have a clear and important nexus to public health and safety, and examples of such tech specs may be a burn-up limit and applying the ALARA to environmental effluents."

Well, I know that years ago, because I've seen graphs about this, when Savannah River was really reprocessing, you could go and look at the charts of the tritium that was being released into the environment.

And I mean, it was enormous amounts of tritium that were released into the environment of South Carolina from the reprocessing there.

So I would want to make sure, the public would want to make sure that we know exactly how much tritium and other things like carbon-14 and xenon and -- what's the other one, krypton, and all of the -- we want to know.

We will never go back to those days when that was being allowed to be released into our air. And I don't know what they're going to do with it, and if it's going to get tritiated and put into the Savannah River, or what they're going to do with it. So that would be very important to have tech specs establishing the limits on those releases.

MR. CAMERON: And is that a tech spec issue? Is that something -- Yawar?

MR. FARAZ: Yes, exactly. For reactors, what we have is we have tech spec requirements on effluents. And to ensure that they're -- or to

demonstrate that they're complying with those tech specs, reactors are required to submit to the NRC their effluent reports on an annual basis.

And in those reports, they do identify the -- all the radionucleides, and the quantities that are released, as well as the impacts, potential impacts to members of the public.

We expect that same -- or a similar type of requirement to apply to reprocessing facilities. And as I said before, we also would expect 40 CFR 190 to apply to reprocessing facilities, that that limit the amount of krypton, iodine, and other radionucleides.

MR. CAMERON: And in terms of public concerns on the tech specs, are the tech specs generally, will they be in the proposed rule, or will they be in another document? Will they be license conditions?

In other words, how will the public have an opportunity to comment on the tech specs before the rule is finalized?

MR. FARAZ: The requirement for having tech specs would be in the rule. The actual tech specs would be in the application.

MR. CAMERON: So in other words, all the

public will see in a rule is there's a requirement for tech specs.

And if the tech specs, the specific ones, are in the license application, then the only way that the public can get their oar in the water, so to speak, on those specific tech specs is to try to intervene in the licensing proceeding. Is that correct?

I think people have a concern about how do they comment, how do they -- how do they express their concerns about those specific tech specs?

MR. FARAZ: I think you are raising the issue about security versus, you know, what gets in the public arena, correct? I mean --

MR. CAMERON: No, I'm thinking, forget about any security considerations. Just take something as straightforward as the releases, using the example you just gave, would -- that's not going to be in a proposed rule, the specifics, and I think I can -- we can understand why.

But how will the public be able to express their concerns, including the state government people? How will the public be able to express their concerns about specific tech specs, just a question for information?

MR. FARAZ: Clearly, we will have a hearing process, and all parties to the hearing would have that opportunity.

MR. CAMERON: Okay. So it would have to -- it would come through the hearing process.

MR. FARAZ: Correct. Yes.

MR. CAMERON: Okay. Thanks. Thanks, Jack.

All right. And Alex?

MR. MURRAY: Yes, I just wanted to expound upon that just a little bit. Yes, the requirements for technical specifications would be in the proposed rule. We would expect they'd be somewhat similar to the requirements for technical specifications which are in Part 50 for reprocessing facilities.

Right now, we expect we may have to fill in some blanks in some areas or some clarifications, but the requirement currently exists in Part 50, and we expect to carry that over into the new regulation.

As regards the specific details of some of the tech specs, staff is planning to revise and in some cases generate new guidance documents which would go into some discussions at length about technical specifications, again, analogous to some of the tech specs documents which exist for nuclear reactors,

which Derek Widmayer was referring to about an hour ago.

There might be a document analogous to, say, a standard tech spec for Westinghouse reactor, if staff were to anticipate putting out guidance, I might say standard technical specifications for an aqueous reprocessing facility, as an example, assuming that the proposed rulemaking goes forward.

And the third point, which Yawar mentioned, and I don't think it was really heard or interpreted by the audience, is we expect there will be an annual reporting requirement on at least the environmental releases and how the environmental technical specifications are being met. All right?

Again, very analogous to the reactor experience, and what the releases are, both in concentrations and total quantities. Those are usually included in those types of documents. All right?

MR. CAMERON: And I think that's very helpful, and the guidance documents where we might have model tech specs, or -- I don't know if that's the right word to use, but typically, the NRC would issue those guidance documents for public comment, as I understand it, so, just so the public knows where

they're going to be able to have an opportunity on this.

And Derek, and then we'll go to Yawar.

MR. WIDMAYER: Yes, I was just going to point out, you know, this document that I referenced for a nuclear power plant, we're talking way down the road here as far as this reprocessing plant. You know, I don't even -- ten years, whatever.

I mean, the conversation we were having before where there should be meetings on these general design criteria, I mean, that would be the next appropriate step, to make -- the public wants to be involved in that, to make sure that these high-level considerations remain in the rule as far as something that eventually would get addressed in technical specification, including the types of things that we were discussing before about the, you know, the ambient room temperature or something like that.

You want to make sure your General Design Criteria are built in such a way that that's something that, you know, because it's a concern as far as the hazard in the facility, would get addressed eventually in technical specification.

So, I mean, there's a lot of steps that we need to take before we get to tech specs.

MR. CAMERON: Okay. Thank you.

MR. MCCULLUM: Yes, the industry would welcome further discussions on tech specs as the rulemaking progresses along those lines. And the public should be involved, certainly.

MR. CAMERON: Great. Thanks, Rod.

And Yawar, more on this?

And then I don't know if Susan wants to add anything, but --

MR. FARAZ: I want to respond to one of Rod's comments. It's about consistency, and I think the intent was that tech specs would be generated for very high consequence accident sequences.

The -- rather than saying that, I think what we did was we presented the criteria, and if you look at the table on the criteria that we're proposing for very high consequence sequences, they should be -- it should be in line with those.

MR. MCCULLUM: Yes, I'm just saying it is confusing, because on page 24 of the original, you talk about high consequences, and then on page 25, you have this statement: "Technical specifications are appropriate for areas and processes that reprocessing and reprocessing facilities with hazards or characteristics more similar to a reactor."

So, you know, just clarification and consistency, straightforward, coming from the safety analysis, is what we're asking for.

MR. FARAZ: Understood.

MR. CAMERON: Okay. Let's go to Tom.

MR. CLEMENTS: Just to clarify, the tech specs would apply to -- it would be technology-specific in this case.

MR. FARAZ: Correct.

MR. CLEMENTS: Just, if you'd react for the record, please.

MR. FARAZ: The answer is yes, yes. It would be technology -- and just to, you know, elaborate on that, Alex had mentioned that we may have standard tech specs or something similar to what we have for Westinghouse and GE reactors.

It might be a little challenging to do that, without -- so I think it would be, what I would expect is, the applicant would develop the technical specifications and then the NRC would, you know, review and approve them, if appropriate.

MR. CLEMENTS: Let me just ask, what do you think the percentage of the design would have to be completed before you were presented with tech specs and react to them?

MR. FARAZ: I think, you know, clearly to generate specific tech specs, an applicant would need a lot of design information. You know, they would need, you know, all of the different limits that go into technical specifications.

They would need to establish surveillance requirements, so they clearly would need a significant amount of design information available to be able to develop those.

What that level is is hard to say. But, you know, they would need sufficient design information to be able to establish those tech specs. I don't know if that helps.

MR. CAMERON: And Rod may have some information for Tom on that.

MR. MCCULLUM: Yes, that was actually a great segue into the discussion on one-step versus two-step licensing.

MR. CAMERON: Right.

MR. MCCULLUM: Because for first of a kind applicants, the level of detail may not be there in an initial application. They may prefer a two-step process.

I would point out that in a two-step process, that gives the public an additional

opportunity to see this at an earlier stage.

So, going back to our proposal, we'd like to see the option of the applicant choosing either a one or a two-step process.

MR. CAMERON: Okay. Let's go to the one-step issue so that before we go on to -- for public comment, which we'll do before we break for lunch so that the public can hear that particular discussion, and as Rod points out, it does have -- it does have important public participation implications.

So, we heard from John's presentation. He talked about the one-step licensing, similar to what's done for reactors in the NRC rules in part 52. Anybody want to start us off?

I'm sorry, Rod, I always look to you.

MR. MCCULLUM: Well, yes, again, we kind of stated our position yesterday, and I just stated it again. Reactor applicants currently have the option of pursuing a part 50 license or a part 52 license, which means they have the option of going for a one-step approach or a two-step approach.

There may be some innovative reactor licensees in the small reactor community who indeed will go for an old-fashioned two-step license. Certainly, the current applications for places like

Vogtle are the new one-step licensing process.

And to the extent it needs additional discussion, I'd be happy to answer questions. But it's our view that recycling, reprocessing, you know, plutonium green washing facilities should all have the same option that reactor facilities have, so.

MR. CAMERON: So, does everybody understand how the one-step -- and NEI is saying, there should be the option, because there may be people who want to come in under the two-step process, which I take it is one-step, is the construction authorization, or construction permit, and the second step is the operating license?

MR. MCCULLUM: Yes. It lets you go after a construction permit before you have the design detail you would need for a one-step process. That's very helpful to the applicant. It's also very helpful to the public.

And you make decisions in a phased manner which, given is the first time -- it would be a first-of-a-kind facility. And again, that's the thinking in some of the small reactor community, having that additional step, having that opportunity to get the review at one level of detail and then get a subsequent review at another level of detail is

valuable.

Now, when you're dealing with an established technology, like an AP 1000 reactor, you're looking for a higher level of certainty from day one to reduce your business risk. And given that you have the confidence that you will have a high level of design detail going in, you want a one-step process for business reasons.

MR. CAMERON: But NEI thinks that there may be some reprocessing facilities where it would be appropriate to use the one-step process.

MR. MCCULLUM: Certainly if, you know, AREVA has its wishes of building regional facilities, I would guess by the time they built the second or third one, they would be preferring a one-step process, given that they'll already have that level of detail.

But I would imagine for any of the first -- for whoever is first, they will probably want a two-step process.

MR. CAMERON: Okay. Well, let's go to Tom, and let's make sure that everybody understands how this works.

Tom? Tom Clements?

MR. CLEMENTS: Yes, Tom Clements.

Concerning the one-step versus two-step, I would be in support of the two-step.

And as you referred to, Rod, the mPower Reactor, they're choosing to do the two-step process. In this letter to NRC Commissioner Klein, which has been referred to in the Gap Summary a number of times from 2007 from the Advisory Committee on Nuclear Waste, they even say, and just to read it, "the NRC should consider using the two-step licensing process for spent nuclear fuel recycling facilities until the NRC staff becomes familiar with their processes, equipment and materials in their recycling facilities."

So, I would think, yes, off the bat, there's no question that it would have to be a two-step process in my mind, because of the inexperience with any of the technologies that are going to be dealt with on an international level.

MR. CAMERON: And Tom or anybody around the table, when the NRC is thinking about the rule language itself on this that would allow the option, how would they achieve language that would meet your concern that if it wasn't an established technology that it should be a two-step?

How would that be done in the language?

I'm not trying to just put it all on Tom.

MR. CLEMENTS: I can't -- Tom Clements. I don't know if I can really speculate on that, but I think there would be some pretty big hurdles that might not be able to be defined initially. So I have some trouble conceptualizing how it could be placed in the rule-making if it was locked in stone when we're dealing with technologies that we really don't know, right now, what they are, nor how they would be designed and constructed, so the basis would have to be two-step. I don't know what that language would be if it would move to one-step.

MR. CAMERON: Okay, and Susan, and then we'll come over, we'll go down this way, Rod, Yawar.

MS. CORBETT: I think I'm just fixated on this water issue, but I could see a scenario where you start building a plant and it takes ten years or eight years to get it built, and in the time that you've built it, there's been some change in your available water resources, where you have to go back and re-look at that, so I think a two-step process in that scenario might be helpful.

MR. CAMERON: So would you -- I'm just trying to test to see whether some people believe that we shouldn't have a one-step option, that we should

always be using two-step. So I'm trying to test that out, because there are some concerns that have been expressed.

MR. MCCULLUM: Chip, could I answer your --

MR. CAMERON: Yes, go ahead.

MR. MCCULLUM: I think you asked a question previously as to how you would provide the option, is that correct?

MR. CAMERON: Yes. Yes.

MR. MCCULLUM: We think that could be done fairly straightforwardly. I mean, it's done, again, in reactor space by having both Part 50 and Part 52 on the books.

You could have two separate subparts to this new rule, part 7x, and one could say, you, basically, at some point in the rule, have language that gives that choice, and go -- you know, if this, go to part x.y, if that, go to part x.z. I think that that --

MR. CAMERON: So, the applicant basically chooses which way they want to go --

MR. MCCULLUM: Yes.

MR. CAMERON: -- and it may be that in the pre-application discussions with the NRC, the NRC

staff could indicate that maybe they're a little bit worried that it was going to be a one-step, but it should be a two-step, but basically leave the choice to the applicant.

MR. MCCULLUM: I would leave the choice to the applicant. And I would say that most applicants would be considering the public interest or public participation interest as a key decision point.

I mean, if I was an applicant trying to build a reprocessing facility in a given community, I would be interacting with my community in advance of that as to what they would prefer, and I would factor that very significantly into my decision as to how I would proceed.

MR. CAMERON: Okay. Let's go to Yawar, then to Derek, and then to Jim.

Yawar?

MR. FARAZ: Although our current efforts are to develop a reg basis document and not to come up with rule language, but if we are asked to develop a proposed rule, I agree with Rod.

You know, I foresee two subparts to part 7x, one addressing the one-step licensing approach and what the contents of the application would need to be, and then one subpart addressing a two-step approach,

where, you know, what the contents of a construction authorization permit would be addressed, and then the operating license application, what that would entail.

In addition to that, you know, if we go forward with rulemaking, there will be a need to develop a standard review plan. And if you're going with a one step and a two step option, then we would need a standard review plan that addresses the one-step approach.

We would need a standard review plan that addresses the construction, authorization, application, and we would need another standard review plan that addresses the operating license.

So, you know, I see -- I mean, it's not that it can't be done. But I just see when you have -- when you're adding options, you're also adding a lot of effort that needs to go into this rulemaking as well as developing the guidance.

MR. CAMERON: Okay. Thanks, Yawar.

Derek?

MR. WIDMAYER: Yes, I think it would be a challenge, and he's expressed it fairly well as far as making sure you have the flexibility described correctly.

I think that the initial position of the

committee that Tom was bringing up is that they would prefer to see the two-step licensing process done at least for the initial facility.

And what I was going to add that as far as the one-step process is concerned, there's been a lot of difficulty with the ITAAC. It's been somewhat problematic for the committee.

So by the time we get to the reprocessing facility in ITAAC, maybe we'll have a lot of lessons learned, and a lot of the problems will be ironed out, but I think that's also something that we want to think about as far as that one-step processes, which things would be appropriate for ITAC, so.

MR. CAMERON: Okay. And Jim?

MR. BRESEE: Just as a reminder, earlier in our discussions yesterday, there was a note that one of the unique features of the used or spent or whatever fuel target that we have in this country is an enormous quantity. The total quantities at the moment are close to 60,000 metric tons.

The largest reprocessing or recycle facility in the world operating at full capacity could not process the backlog in less than 50 years.

So, it's clear that if recycling or reprocessing ever becomes a method for waste

management in this country, there will be multiple facilities.

And so the point about the first of a type, perhaps, requiring two-steps simply because of insufficient backlog by -- could very well result in future activities of a similar type being licensed by --

MR. CAMERON: That might be more appropriate, then, for one-step, because it would be a replication, perhaps, or --

MR. BRESEE: That is certainly one of the conceivable futures.

MR. CAMERON: Okay. Thank-you. Yes, what I'd like to do is go out to the public, and then we'll come back. And you have to go sit out there.

(Laughter.)

No. I know we will. I know we will, come on.

(Laughter.)

All right. Let's go to the public. Let me go to Suzanne and her colleague first on this. Well, let me go to Suzanne and then to the woman sitting beside her.

MS. RHODES: Okay. Thank you very much. I've learned a lot here the last couple of days. I'm

really glad I came. I'll contradict myself.

I think this was an extraordinarily useful meeting. I hope it doesn't go past the draft stage, but I hope you do something good with the draft to keep it available and figure out a way to put comments on it, perhaps.

The other misperception I had, I thought that because of the discussion of waste minimization that was supposedly associated with reprocessing that this would be a more or less government function out of the waste fund prior to repository, and then some sort of a mechanism to sell the product back to industry.

And I understand that that is not at all the case, that I guess what you all are thinking now is that individual utilities would make individual contracts with reprocessing facilities, whatever, as a corporate decision, and there would be corporate money rather than taxpayer money financing all of this.

And I don't know if this is still up in the air, or if it is definitely -- corporations would want to go forward.

If that were the case, somewhere down the line, before this gets too far away, I think there ought to be a serious discussion with the industry.

And maybe there already has, I know you all, NEI is extraordinarily good at that.

But I don't want it to turn out like another MOX where it's a party where nobody wants to come. It's a lot of very complicated things that are going to get people inflamed and use a whole lot of staff resources, if nothing else.

But anyway, I've really appreciated the kind of tenure you all have had with the industry and with each other, two different kind of tenure. But anyway, thank you very much.

MR. CAMERON: Thank you. Thank you very much, Suzanne.

And Brandon, you have Suzanne's information.

And if you could just introduce yourself to us.

MS. PARKER: Hi. Thank you all for allowing me to speak today. My name is Debbie Parker, and I am the legislative and program director at Conservation Voters of South Carolina, which serves as the political voice of the conservation community in South Carolina.

We actually host something called the Common Agenda Process, which is a consensus-building

process that we host with approximately 40 different conservation organizations in South Carolina to establish a set list of environmental and legislative priorities each year.

And I just wanted to submit some formal written statements actually that I have copies of for, I guess, the panel, to put on the record about the conservation community's position on nuclear energy.

Although, as you all may know, the general conservation community in South Carolina does not have one set position currently as to the future of nuclear energy and the role it may play in the energy mix, but we all are very much unified on our position against further storage of more nuclear waste at the Savannah River site or anywhere else in South Carolina.

So my comments actually refer more to that. And I notice, I think you all spoke a little bit more about that yesterday, but I just wanted to make sure that South Carolina was on record today about our feelings from the conservation community on nuclear storage.

We deeply appreciate the important role that Savannah River site has played in our nation's defense. Our own organization has developed strong and positive relationships with our state's military

community in support of efforts to reduce our country's dependence on foreign oil and promote its national security.

As you may know, the conservation community in South Carolina has played a constructive role in discussions about the future of nuclear energy in our state. We know that meeting our country's future energy needs will take a balanced approach, and that we need to look openly and objectively at all of our energy options.

However, our community has also worked very hard to establish consensus on nuclear waste, as South Carolina has already carried more than its fair share of the national nuclear waste burden.

In 2000, our community helped negotiate the Atlantic Compact, which closed the Barnwell Nuclear Waste Facility to all states but South Carolina, Connecticut, and New Jersey.

Efforts to undo the Atlantic Compact in 2007 led to a spirited and successful defense of the compact. In short, South Carolina has spoken firmly and finally on the issue of importing nuclear waste to our state. We therefore strongly oppose any effort to consider SRS as a possible repository of greater than class Z and GTCC-like waste.

There's obvious geologic and environmental unsuitability of the site. SRS has sandy soils and a wet climate, making it highly unsuitable for any kind of nuclear waste disposal near the surface. Two obvious and possible storage options being considered for GTCC waste, surface vaults and trenches, are especially incompatible for SRS.

Second, any proposal to bring GTCC waste to SRS actually violates the current and stated mission of the site, which is to reduce the concentration and longevity of high-level waste currently on site.

The Department of Energy's own Office of Environmental Management, which is heading the SRS cleanup effort, has stated that footprint reduction is a major goal, and our nation's taxpayers have devoted nearly $1.6 billion in Recovery Act funds towards that goal. Opening SRS to GTCC waste runs exactly counter to this effort.

And finally, bringing GTCC waste to SRS makes little sense considering how far behind the facility is in meeting its waste reduction mission.

In its comments opposing GTCC at Savannah River Site, our South Carolina Department of Health and Environmental Control observed approximately 36

million gallons of high-level mixed waste are stored in aging tanks with leak sites, while there's currently no operating treatment facility with the majority of that volume.

A substantial volume of trans-uranic waste remains in storage at SRS awaiting appropriate disposition. Radioactive contamination remains in many areas slated for future cleanup decisions. Disposal of GTCC and GTCC-like waste is inappropriate at SRS, given the current cleanup backlog.

Thus, Conservation Voters of South Carolina and other conservation organizations would like to offer two immediate steps.

As you know, during DOE scoping meetings in 2007, many Americans offered Hardened On Site Storage as the best storage alternative while a long-term solution is formulated.

With Hardened On Site Storage, GTCC waste and irradiated spent fuel remains at commercial nuclear power plants in long-term storage so that it can be monitored and protected.

While HOSS is not a permanent solution, it provides a safe way of storing waste until a scientifically sound solution is found.

Secondly, we recommend that DOE not

proceed with the final environmental impact statement for greater than Class C waste, but rather develop a new draft EIS that includes HOSS facilities as the best interim solution for GTCC waste, and then seeks a permanent geologic disposal site for GTCC waste disposal that reflects our best science, not politics.

And we feel like as the deliberation continues to manage the high level nuclear waste accumulating at our power plants, we'd like for you to consider that South Carolina's conservation community has very grave concerns about any proposals that would bring more nuclear waste to our state.

Conservation Voters of South Carolina, along with the Coastal Conservation League, South Carolina Wildlife Federation, and numerous other groups that we work with of the 40 organizations that are part of the Common Agenda would like to state for the record that we oppose importing waste under any conditions, including under the guise of interim spent fuel storage and/or reprocessing proposals.

And thank you all again for holding these very important meetings over yesterday and today, and thank you for all your hard work as you try to figure out the best solution.

MR. CAMERON: Thank you for those remarks,

Debbie.

And we're going to go to the good doctor here, and then we're going to go to the two Brets from the NRC, and then we'll come back to the table for Alex. And perhaps we'll be ready to break for lunch then.

Yes?

DR. HAYES: Thank you. Do I need to introduce myself again?

MR. CAMERON: No. We know. Brandon knows.

DR. HAYES: All right. This goes to item four on page -- I think it's page 9, that says, what does the NRC need to consider when updating the NUREG-1140?

In this meeting, there's been a significant focus on quantitative analysis or probabilistic risk assessment methodology.

I'm reminded of a book I recently was reading by John D'Agdata, in which he quotes someone who I cannot remember, but I think it was a Fairleigh University professor, who said that relying on probabilistic thinking causes us to dismiss the possibility of an event.

And, of course, probabilistic thinking is

exactly what caused science and engineering to fail to prevent such recent disasters as TMI, Chernobyl, Fukushima Daiichi, Exxon Valdez, BP Deepwater Horizon, and numerous others.

We've fallen deeply into this pit of probabilistic thinking.

Considering these disasters leads us to the broader question of why the US has even moved to spent nuclear fuel reprocessing. Derek just said that reprocessing plants are 10 years down the road. And Jim is saying that the largest reprocessing facility possible would take 50 years to burn up all of our current storage of SNF.

Someone yesterday mentioned the fact that fast reactors are 50 years down the road. And I wonder why the government isn't focusing instead on faster reactors rather than our current focus on reprocessing spent nuclear fuel, because we could go to transmutation through fast reactors, if I understand correctly the concept of fast reactors.

And fast reactors would relieve us of the public hazard exposure problem, and probably even more importantly, the worry we have for nuclear proliferation.

MR. CAMERON: Thank you very much.

We're going to got Brett from OGC, and then we'll go to Bret from NRC.

MR. KLUKAN: Hi, this is Brett Klukan from the Office of General Counsel. Like most attorneys, I am principally concerned with my own self-interest.

(Laughter.)

And as an attorney who, were this, I mean, moving forward, would probably be one of the ones involved in the licensing of a such a reprocessing facility, I'd like to ask a clarifying question to industry.

When we talk about one-step licensing and part 52, that actually can be a couple of steps with regards to the early site permit and LWA process. And the first part of my question goes to that. Would it be industry's expectation to carry over those parts into part 70x?

And then the second part is, if we are adopting -- if it is industry's intent to essentially carry over part 52 or the licensing structure in part 52 into part 70x, would it be industry's expectation that the hearing structure, meaning, there's a hearing potentially at the ESP stage, a hearing at the COL stage, whatnot would be the same?

MR. CAMERON: Okay. Good questions.

Rod, why don't you give us an idea on that, and I know that the second Bret has something for you too, but why don't you do that?

MR. MCCULLUM: Well, while the possibility of an ESP for a recycle facility is actually very intriguing to me, I work with ESP folks also at NEI, have not heard any interest expressed from industry on that.

It does, on one hand, give you an option to make the one-step processing process somewhat two-step, which I think is what you're getting at. There is that option. So you'd really, you'd have a nesting of options.

However, the reason Part 52 was designed that way was because it envisioned the design -- it envisioned a standardization of reactor designs.

It envisioned two separate tracks, the track of picking a site, and the track of designing a reactor, and then the reactor vendor would sell to multiple sites.

So the reason an ESP makes sense is because you address only the siting issues, and then you marry that up with another process that addresses the reactor design, and then you go for a COL.

In this case, and I think a lot of the

discussion we've had that has been educational to me has born that out, that it's hard to -- the design issues and the siting issues are intrinsically related.

And I'm thinking the public would want to, in both steps, be looking at the design of the facility and how it protects their -- in areas like effluents, particularly.

So it's an intriguing possibility, but again, that's one of the reasons why we'd like the option, because we don't see the same utility for those parts of the 52 process in part 7x.

MR. CAMERON: And any ideas on how the hearing process might work? I don't know if you want to tackle that one. That was the second part of the question.

MR. MCCULLUM: Well, I think it worked very well.

(Laughter.)

I mean, you know, it is one of the things that I think makes NRC an outstanding regular is that their processes allow the public to effectively have their day in court.

You know, if you don't like something that NRC is seeking to license, then, you have that

opportunity to intervene.

And, you know, if your contention meets the standards for being accepted and all that, your legitimate concerns will be heard by an adjudicatory panel that essentially, that's like going to trial. That's an adversarial proceeding.

So, you know, providing opportunities to do that in a two-step process, you know, that the public would benefit from that.

And again, I would think that a potential applicant, I mean, if I'm a potential applicant and I want to build a reprocessing facility in a community, I'm going to be very concerned about building support and trust with that community.

So I'm going to want to seek a process that the community has confidence in, and --

MR. CAMERON: Okay. Thank you, Rod.

And let's go to Bret Leslie, easier to pronounce for me. And then we'll come back up to the table to Alex, anybody else. And then we'll take a break for lunch.

Bret?

DR. LESLIE: I actually had four things, but because we all want to go to lunch, I'm only going to talk about one right now, get back to the other

ones later.

But it was something that you said earlier, Rod, and it kind of plays into the overall methodology.

I think when the staff was -- and I'm primarily talking about the people who were up at the table, but when we were approaching this, we were taking into mind the idea of technology-neutral, providing flexibility.

And so I think when we were looking at, what are the possibilities in terms of how large a facility or the type of -- the various parts of a reprocessing complex, we weren't necessarily looking at limiting in terms of how large that source term might be.

But you said something that was very intriguing, which was this. You don't envision having source terms that would be beyond the Protective Action Guideline. In other words, you wouldn't get to the triggers that Dennis was talking about.

Now, that -- NRC could go that approach and say, yeah, for any reprocessing facility, for any part of that facility or any technology, you can't have a larger amount than this, and then those criteria that Dennis talked about would never come

about.

I'm not sure that's what you meant, but that's how I'm interpreting it. And so I think if you can explain how that plays into kind of -- how does it play out, either in terms of IROFS, or is that really what you meant?

MR. MCCULLUM: Not exactly, and I'm glad for the opportunity to clarify. You know, I'm not saying that we would limit by inventory the facility so that absent any safety controls, you would never go beyond the protective action guidelines.

What I'm saying is that we would be looking in our design philosophy to make sure we put in place IROFS that would prevent you from going beyond that.

You know, when we're looking at impact of the public health and safety, we're going to look at putting in place seawalls and ventilation systems that prevent you from getting to that -- to those more protective thresholds, you know.

And what I was really doing was criticizing the utility of having yet another level of accident above a high consequence accident, there's very high consequence, and he was talking about some extremely high thresholds.

And I'm thinking, I'm not going to wait until I have the possibility of an accident at that level before I start designing against it. What I was talking about was a matter of design philosophy.

If my design philosophy is going to be protective at a more stringent threshold, it's going to aim for meeting a more stringent threshold to the point where I didn't see the additional utility of, you know, of that. Then I'll look at Sven. Does that make sense?

MR. CAMERON: Okay. I think -- yeah.

MR. MCCULLUM: So, yeah, no, I was not saying that we would limit -- we would never have the inventory where if there were no controls in place, we would never have to worry about those things. I was talking about where we focus the design of the safety -- in the IROFS.

MR. CAMERON: Okay. Thank you.

And Alex? Alex Murray.

MR. MURRAY: Finally. I don't know if I can handle this. Okay.

MR. CAMERON: And thank you, Alex.

MR. MURRAY: Thank you, Chip. Its own oxygen for a while, there, you know?(phonetic)***12:23:31

I just wanted to give a couple of informative comments, if I could, please. The first one, since we're out of time on it, I encourage members on the panel, members in the audience, to submit information, written information, on the level of detail that they might envision for either a one-step or a two-step licensing process.

In the past, some of the Part 70 reviews and some of the Part 50 and 52 reviews at the level of detail that -- how shall we say -- well, let's just raise it this way.

There has been a difference in perception about the level of detail needed to meet the regulation, between industry, staff, and the public. Okay, after, and it comes out with five or six opinions, not just three.

So I encourage everyone, please, if you have thoughts, intelligent and constructive thoughts on the matter, please submit them as written comments.

Second, there was a very good comment from a member of the public about risk, and if you just do risk-informed, risk analyses, you can have -- still have bad events occurring.

And I want to emphasize the NRC's proposed approach is to take a balanced view, a balanced, if

you will, methodology, through this regulation.

Yes, it will be risk informed but it will also be performance based. There will still be general design criteria which must be met, okay, absolutes. Not relatives, not risk-based. Okay?

There are requirements that will be associated with reprocessing types of facilities in this proposed rulemaking, assuming it goes forward.

And I encourage, if you have further thoughts on that, please, again, submit to us some written thoughts, some written comments on that.

And the last item, and again, this gets back to, you know, please think on this, and if you have thoughts and constructive comments, please submit them as well, and this relates to this -- what we call this methodology where we're introducing the concept of very high consequence events.

Please understand, a very high consequence event, we are basing the identification of these events upon unmitigated, unprevented consequences, okay, in a manner similar to how we approach safety analyses at the NRC and in the nuclear industry.

This does not mean that the event occurs. Okay? We would not allow these events to occur, okay? They have to be -- this is purely for

identification of these events before controls are applied to either prevent and/or mitigate their occurrence or their severity. Okay?

So it's very important to keep that in mind.

And I do ask, again, for comments on that methodology, and also, how would we identify these events? We have been struggling with, do we take an approach that is strictly dose-based? The NSCR and myself had mentioned some potential limits earlier in the discussion.

Should they be somehow material based, okay, which is based on what NEI did with a proposal where it would just be fission products. Should they be receptor-based? Should they be based on members of the public, or site workers, specific workers, generic workers, the environment, potential PAGs from the EPA, and so forth? And economic consequences.

Okay, so please, if you have thoughts, please submit them on to the NRC so that we can evaluate these and have meaningful input.

And I'll just make one last comment. At the present time, we do not have any specific reprocessing plant designs or safety analyses that we can look at.

The staff has, however, done some internal preliminary estimates, and we do think that there are a number of accident sequences that will bump into this category that we are calling very high consequence events, which will require additional focus and safety controls and more rigor in the analyses.

So, we welcome anything from industry or members of the public as to their thoughts on that matter. If they have any calculations or analyses they would wish to share with us, we would greatly appreciate it.

Thank you very much.

MR. CAMERON: Okay. Thank you, Alex.

And this was a difficult area, and I think you had a great discussion on it.

What I'm going to suggest is that we come back at quarter to two. That's an hour and 15 minutes.

I think we're going to have plenty of time for Marshall Kohen and his colleague, Steve Ward, on the security and material control and accounting. I'd like to start in with that.

I think we're pretty much finished with this subject, but we'll have time after Marshall and

Steve to revisit any of this.

Our other agenda items, we want to go around the table before we leave to just get any last impressions from all of you. And Jack Davis is our senior official, NRC official, is going to close the meeting for us.

And then for those of you who can stay around, we're just going to have, you know, an informal open house.

And as you all know, the NRC is not able to provide any refreshments of any type, but someone may buy beer, I don't know, down there.

(Laughter.)

But at any rate, let's come back at quarter to two.

(Whereupon, at 12:30 p.m., the meeting was recessed, to reconvene at 1:45 p.m.)

MR. CAMERON: Okay, everyone. Good afternoon. Welcome back from lunch, and we're going to get started with our final discussion topic, which is material control and accounting and security, and it's a pleasure that we have Marshall Kohen here, who's going to do the presentation, and his colleague, Steve Ward. They're from NRC's Office of Nuclear Security and Incident response. Oh, you're not from

there?

MR. WARD: No, I'm from NMSS.

MR. CAMERON: Another NMSS guy. But Marshall is going to do the presentation, and then we'll just open it up for discussion.

MR. KOHEN: Well, thank you. Good afternoon. As Chip said, my name is Marshall Kohen. I'm a security specialist in the NRC Office of Nuclear Security and Incident Response. I'm going to talk to you a little bit today about four gaps that have to do with the Safeguards and security aspects of the potential reprocessing rulemaking.

This should follow the same format that other presentations did. So you'll see a consistent format. First, talk a little bit about the gap summaries and remind you what we're talking about in terms of these four gaps. Gap 4 had to do with the exclusion of reprocessing facilities from the Category 1 material control and accounting requirements in the regulations.

Currently, there is an exemption in 10 C.F.R. 74.51 that excludes reprocessing facilities from the Category 1 MC&A requirements, and as we all know, I think, a reprocessing facility is likely to be a Category 1 site, or require a Category 1 level of

MC&A and physical protection.

Gap 8 discussed the risk-informing that would need to be done on the Safeguards and security requirements in NRC regulations. Currently, the quantity-based categorization scheme in the existing regulations, both in Part 73 and in 74, may not be appropriate to address the different attributes and risk levels of nuclear materials that are handled at a reprocessing facility.

On Gap 17, this discussed what's called Diversion Path Analysis. This type of analysis would provide an effective detection and response program to mitigate Safeguards vulnerabilities and security system weaknesses. Safeguards requirements in the event of a DPA and inclusion of a DPA would then be more risk-informed.

Finally, Gap 18, there could be challenges due to the nature of operations of a reprocessing facility. With respect to a couple of items, pre-defined limits on inventory different determinations and inventory frequencies.

Now onto the proposed positions or thoughts, at least, on how to address these gaps. With respect to Gap 4, the Commission directed staff to remove the exemption of the reprocessing facility

from Category 1 MC&A requirements, as part of the ongoing Part 74 rulemaking, and that was through the SRM that you see on the screen.

The draft Part 74 rule is expected to be released for public comment this December, and a preliminary copy of this rule text is on Regulations.gov. So you're welcome to take a look at it at your leisure.

With respect to Gap 8, the Commission approved the staff's development of a revised categorization scheme, and it did so in SRM SECY 09-0123. One of the caveats in the SRM was that the Part 73 rulemaking shouldn't focus on the categorization of material that's associated with reprocessing.

What it said was as a separate effort, and on a lower priority, there should be analysis done of the material categorization approach for materials at a potential reprocessing facility. Staff's currently developing a technical regulatory basis to support the rulemaking in that respect.

Similar to Gap 4, on Gap 17, the Commission directed the staff to consider incorporating Diversion Path Analysis into the reprocessing regulatory framework, through the same SRM. The staff planned to add a requirement to

conduct Diversion Path Analysis to the MC&A regulations for reprocessing.

Finally, in Gap 18, the staff is currently considering changes to the inventory frequency, limits on inventory difference, limits on error measurements and other material accounting aspects regarding materials at a reprocessing facility.

With respect to what we have received to date from stakeholders as input on these four gaps, on Gaps 4, 17 and 18, which are the material control and accounting gaps, there's been, we assess that there has been general agreement with the staff approaches to do a couple of things: to make the reprocessing facilities subject to Category 1 regulations; to require a Diversion Path Analysis; and to adjust the material accounting limits as appropriate.

Regarding Gap 18, we also assess that there's been agreement with the staff approach to revise the material categorization approach. In fact, we received a letter from NEI in August of 2009, advocating the inclusion of a material attractiveness approach into this scheme.

We do note that there have been some stakeholders who have stressed the importance of this process in the treatment of mixed oxide fuel. With

respect to integration of the gaps, on Gap 8, the revision of the material categorization approach for physical protection purposes will certainly drive a decision on how that approach is used in the MC&A world as well, since they're complimentary disciplines.

For Gaps 4, 17 and 18, the removal of the exemption for reprocessing facilities under the current Category 1 rules will place reprocessing facilities under Subpart E of Part 74. If the Commission permits NRC to proceed or the staff to proceed with rulemaking for reprocessing, the staff will then add a new subpart to Part 74, that will be similar to Subpart E, but will incorporate the changes necessary to regulate MC&A at a reprocessing facility, including resolutions to Gap 17 and 18.

Finally, any changes that would result from Gap 8, as I said before, this is the other side of the coin, would then be included in the MC&A rulemaking, and help to close Gaps 4, 17 and 18. So finally, we brought up a few questions that we thought people might want to ask. Obviously, there will be, we believe there will be more than this, but just for food for thought.

If there are any problems that are created

by development of the regulatory basis for risk-informing Parts 73 and 74 separately from the regulatory basis for potential rulemaking, and how that would affect the licensing aspects.

What should a Diversion Path Analysis include? Which documents should NRC staff consider in developing the rule language and guidance for conducting Diversion Path Analysis, and finally, what specific challenges does the potential licensee community foresee in meeting the material accounting requirements for Category 1 facilities, including a reprocessing facility?

So that concludes my remarks, and I think -- do you want me to go back?

MR. CAMERON: I think maybe this is the best way to organize the discussion, rather than just going gap by gap on this. I just had one process question for you, before we begin, Marshall, for people who might be interested in commenting on the proposed rule that's going to be out in December, although what's said here by the panelists or the audience is going to be very useful for you in moving forward with this.

They won't be considered as formal comments on the proposed rule, so that I guess that's

a question. So that if people want to formally comment, they should keep track of when the proposed rule appears for comment. Is that correct?

MR. KOHEN: Yes, that's right, and with respect to the Part 74 rulemaking, I'll let my colleague, Mr. Ward, handle those particular comments.

MR. WARD: Actually, right now, as was mentioned in the slides, the draft rule text, and that's only the rule text; it doesn't include the reg analysis or all the other documents that you're used to seeing with the rule officially going out for public comment. They call this a preliminary public comment period.

It is currently on Regulations.gov, and that comment period actually runs through June 30th. So if anybody has -- if anybody wants to submit comments on that draft text as it stands, we would welcome those. Obviously the end of the month is coming up very soon. But those comments would be welcome, and of course, there will be a *Federal Register* notice in December, when we expect the official draft rule package to come out.

MR. CAMERON: So that there is a preliminary comment period. I'm glad you pointed that out, for everybody to know. Is there any magic to the

sequence that we take these questions, and Kevin, did you have a question?

(Off mic comment.)

MR. STRICKLAND: I just needed you to repeat the document that's up for comment.

MR. WARD: What's on Regulations.gov is what's called the preliminary draft rule text. So it's the actual text of Part 74 and a few other subparts or a few other parts that needing conforming changes, but nothing else. There's no statements of consideration or anything. It's just the text.

MR. STRICKLAND: Okay, Part 74.

MR. CAMERON: Great.

MR. STRICKLAND: As long as they have this mic turned on, could you define material attractiveness? I've never heard that term. I'm just interesting. I usually ask about acronyms.

MR. KOHEN: Sure. I can give you a general description of what we're talking about. Part of the current material categorization scheme is that it's a two-factor approach, for type and quantity. So it's the type of material and the quantity that you have at a facility.

What we're looking at in general terms is looking at different aspects of the material than that

forms, for example. So what we mean by attractiveness is attractiveness of the material in a certain form and in a certain quantity to the adversary, in taking that material and doing something with it, particularly creating an improvised nuclear device. That's what we mean by attractiveness.

MR. CAMERON: So it's a broader look than the traditional two-part look --

MR. KOHEN: That's correct.

MR. CAMERON: --the type of material, okay.

MR. KOHEN: Correct.

MR. CAMERON: Any other questions before we get into discussion? This is Tom Clements.

MR. CLEMENTS: Yes, Tom Clements. Just a follow-up on that attractiveness. Could you give an example of what you mean, say, plutonium oxide versus fresh plutonium MOx, and what you think the attractiveness might be, and if you could address, in the case of the MOx, that if the material, if the fuel was processed in some way, you could get the plutonium back out, but you might not be able to build a, you know, improvised device immediately if you got your hands on it. It would require further steps.

MR. KOHEN: Okay. Let me answer the first

part of the question first, and I'll use a different example, because this is an example that we've used in the past, particularly when talking with senior managers.

The example that I like to use is 2 kg or 5 kgs of high enriched uranium in metal form is very attractive, especially compared to that same quantity of material dispersed throughout a rail car of dirt, okay.

So if you think about what an adversary could do with that quantity in a metal form, for example, versus some of the stuff that we ship out to Idaho for burial, which is in a different form, and dispersed throughout a rail car of dirt. It's more difficult for an adversary to capture a certain quantity of that material to be able to use it.

So that's what we mean by attractiveness. That's sort of a relative comparison of attractiveness.

MR. CLEMENTS: Well, let me ask you another, about another -- it's not a hypothetical. Plutonium stored, contaminated plutonium, weapons grade plutonium, stored, that can't be used because of contaminants for a MOx plant, say it's in an urban site.

If that material is going to be disposed of in -- as true waste in the Waste Isolation Pilot Plant, and it were to be mixed into a disposal container to be taken to WIPP, but it still hasn't been denatured.

It's weapons grade plutonium, but it's in a drum with some kind of mixture to disperse it, what is the level of attractiveness under this approach, of that material that's weapons grade material, which would be disposed of without a radiation barrier in WIPP?

MR. KOHEN: Right. Thanks for the question. That's a very, actually very specific question, and it has to do with a level of detail that I'm not comfortable talking about at this point. One of the things that's going on is we have a couple of studies that are underway, and hopefully almost completed, that we believe will inform not only the rulemaking, but the development of guidance and development of our technical basis.

And so those details are a little bit preliminary for me to discuss, and so I think I would like to leave it at that.

MR. CAMERON: Okay.

MR. YEAGER: I'm not familiar with that

particular item, Tom. You know, the WIPP shipments are coordinated through DOE, and through grants, there are -- they are very secure. They're very -- you know, currently, if I understand what you're saying, these are shipments going to WIPP, right, with plutonium?

MR. CLEMENTS: I'm not just talking about WIPP waste. I'm talking about larger contaminated weapons grade plutonium that can't go to the MOx plant, but it wasn't really true waste.

MR. YEAGER: I thought yes, when you were saying. Okay. I thought you were maybe speaking about the WIPP shipments.

MR. CLEMENTS: Not the traditional true waste.

MR. YEAGER: Okay, because those are escorted by law enforcement, pretty much along the entire corridor.

MR. CAMERON: Okay. Thanks, Mark. Jim.

MR. BRESEE: Yes. I suspect that at least part of the input to the NRC's issues with regard to attractiveness would come from some of the Safeguards studies that are really NNSA-sponsored activities, and most of the publications on the subject have come out of Los Alamos. Is that -- am I correct in that?

MR. KOHEN: Well certainly there's been historical work done in this regard, and we do have a current study that Los Alamos is doing for us, that's going to be one of the major inputs to the rulemaking.

MR. BRESEE: There was, in answer to Tom's question, there was -- there have been some open publications on the subject, and I would refer you to a paper at a global conference last year, that discussed in some detail how one would determine the so-called attractiveness of mixtures of materials.

Generally speaking, that's what you're talking about, is some dilution of materials that have weapons significance.

MR. CAMERON: Okay. Thank you, Jim. This first bullet up there is what I would call a process question, is that -- does anybody see any problems if the NRC proceeds with 73 and 74 separately from the reprocessing rulemaking? Rod.

MR. McCULLUM: The only way I would see problems really come in terms of schedule, I think it makes sense to do that. I think risk-informing Part 73 and 74, getting the right definition of subcategories and the appropriate grading of requirements across the categories and subcategories is probably the key to making all of this work for

reprocessing facilities.

And maybe this is more of a question. A couple of areas where I see the schedule, one, I mean you've got one rulemaking that's in process now to remove the exemption, and then this will be a subsequent rulemaking.

If you had, if you complete the first but don't complete the second, then that does create a problem, in that now you have declared it a Category 1 facility, but you haven't risk-informed the Category 1 requirements.

The other thing would be if the Part 73 and Part 74 rulemaking lags this rulemaking. Now we heard yesterday, we're still hoping for 2015, but there are apparently some budget issues. That might slip. I don't want it to slip. We'll probably comment on that.

But I think if NRC staff can assure us that the schedule for the Part 73 and 74 rulemaking will stay in sync with this rulemaking. By in sync, I mean sufficiently ahead of it, it sounds like the reasonable approach, I mean the right way to go.

MR. CAMERON: Okay. Whoops. Sven.

MR. BADER: I'll caveat this, that I'm not expert in this field. But I guess from an AREVA

position, we're kind of wondering, can you tell me what the fundamental differences are between Part 73 and 74 and the IAEA regulations that the rest of the international community follows?

MR. WARD: First off, Part 73 is the NRC's regulations for physical protection, at both nuclear power plants, fuel cycle facilities. Part 74 is specific to material control and accounting. Obviously, there's some synergy that exists. Many material control features of the plant are physical security features as well, and so they do work hand in hand.

Now the next part of your question was like the IAEA requirements, and there are two aspects to that, and one is, you know, the IAEA does have requirements for Safeguards that are implemented in non-nuclear weapons states, and because the United States is a weapons state, plants here are not automatically required to meet those IAEA requirements.

However, the United States has voluntarily and through various treaties over the last 50 or so years, committed ourselves as a government and by default, some of our licensees, both NRC and DOE, to adhere to some of the standards set forth by the IAEA.

So the most likely effect for, and this is just predicted; nobody knows how this would shake out. The most likely effect would be there are regulations in Part 75 that licensees have to adhere to, concerning reporting to the IAEA, and through the U.S. government.

The reprocessing facility would be considered by an inter-agency group of the U.S. government for potential inclusion on what is called the eligible facilities list. If a reprocessing facility is put on that list, then the IAEA, at their discretion, may choose to implement Safeguards at that facility. But that's a long process and there's a lot of steps that would have to be taken to get to that point.

MR. CAMERON: And before we go to Susan, I think Marshall has something to add on that.

MR. KOHEN: Yes. I just wanted to follow on. Steve sort of gave you the MC&A side of that question that Sven asked, and let me talk a little bit about the security aspect. Unlike the MC&A, what were called requirements, there are really no security requirements at the IAEA level and sort of on an international level.

The IAEA puts out a guidance document.

It's titled Info Circ 225, it's now in Revision 5. That is, again, a guidance document. There are a number of countries throughout the world that utilize that document, and in fact many of them take the text verbatim and put it into their national legislation.

The United States doesn't do that, but we do attempt to, at our best, DOE particularly and NRC, make sure that our regulations for physical protection are as consistent with the guidance, the recommendations in the Info Circ 225 as possible and as appropriate within our legislative structure.

So for physical protection, there really are no international requirements for security, simply guidance.

MR. CAMERON: Sven.

MR. BADER: I just want to follow up. So does that mean if somebody chose to design their facility here in the United States to IAEA regulations, instead of NRC regulations, we'd meet the NRC regulations? Or are the NRC regulations more restrictive than the IAEA regulations?

MR. WARD: Well first off, from MC&A's standpoint, NRC regulations are more restrictive. The IAEA Safeguards, which are requirements in other countries except here, are requirements. Just like

for physical security, however, when it comes to MC&A, the IAEA only has a guidance document. Similar to what Marshall said, some countries have adapted the IAEA guidance directly into their national legislation.

But in the United States, our MC&A requirements are much stricter than if you were to just copy the IAEA, MC&A or IAEA Safeguards requirements.

MR. CAMERON: And one more follow-up.

MR. BADER: So we're a weapons state that applies IAEA, more restrictive requirements than non-weapons states across the globe. Is that the way I understand that?

MR. WARD: Yes. There's a fundamental difference between MC&A and IAEA Safeguards. IAEA Safeguards are directed to prevent the proliferation of nuclear weapons. So one, the IAEA is concerned about a much greater adversary, the state, the country potentially being, trying to divert this material, not just someone at the facility.

The IAEA is also largely concerned about identifying diversion within a certain period of time after it has occurred. MC&A, in conjunction with physical security measures, are much more geared

towards preventing that theft or diversion from occurring in the first place.

MR. CAMERON: Susan.

MS. CORBETT: I hope I'm not being redundant here, because I have to admit that sometimes I feel like y'all are speaking a different language than me, because I'm not a technical expert. But I think this is the correct place to ask a question about insider threats.

Jim and I were kind of talking about this, because one of the concerns of the public is that weapons grade material be stolen and used to create bomb material or whatever.

There's a really excellent movie that came out two years ago called "Countdown to Zero." It's more about nuclear weapons. But in the context of that movie, they documented a number of cases, mostly in Russia, but where materials have been stolen a gram at a time from probably uranium enrichment, but other reprocessing places as well.

So it's a concern of the public that, especially in the world that we live in today, that we make sure that weapons grade material isn't stolen and used for horrible purposes. So I think one of the things, as a member of the public that I would like to

see in this, is that this analysis should include an identification of the materials that could be stolen.

I mean I think the public would like to know what is being produced here that could be, that is weapons-usable. It may not be weapons grade, but it certainly could be weapons-usable. I'd like to know what that is, to identify those, how it could be stolen, you know. There's conjecture about how it could be stolen, what kind of access is there to these materials, who gets to access them.

Is it done; is it just a single person? Is there always a team of people when they come and access this material? Are there background checks and you know, when you first talk about building this first facility, it's very possible that it could be within the confines of a DOE site.

But if we're going to build 20 of these, then it's very likely they won't. So you're talking about just having one and, you know, the DOE's Savannah River site is very secure. You can't just sneak in there. But if these are located around the country in regional places, it could be a lot less secure.

So the standards that apply to a site located at a DOE plant might be different than what

needs to be looked at in an independent-standing site. So how are you going to address these, the insider threat of diverted material? I think the public would like to see that, an analysis of that.

MR. CAMERON: Marshall, Steve, can you talk about the NRC approach to questions like Susan's, and I would assume that the type of information that you develop on that is going to fall into the category of -- that won't be able to be shared with the public? I'm asking a question on that.

But I think first of all, you know, what do you do? What's the approach to developing that type of information, and do indeed we develop the information that addresses Susan's questions?

MR. WARD: Well first off, just our existing MC&A and physical security regulations for all facilities do address measures to preventing the insider threat at all types of facilities. That's something we look at often, and you know, we have and are currently in our proposed Part 74 rule that we're working on.

Features such as requiring two person rule or other overchecks, to ensure that one person cannot act alone and divert or misuse material without either having another person present or some other means of

checking and verifying that no inappropriate actions were taken.

So that's a big part of our existing regulations, and the regulations are stricter for Category 1 fuel cycle facilities in that regard.

The next part of your question, as Chip alluded to, a lot of the security and MC&A information for facilities is classified, to a certain extent, and we do our best to provide information, particularly in the form of guidance documents wherever possible, that can be publicly released.

If we go forward with this rule for a Diversion Path Analysis, a big component of that will be developing a guidance document for the licensee community, to know what exactly we intend for them to do.

I can't tell you right now for sure that that guidance document will be totally publicly available. But we will certainly try our best to at least have the guidance document, of what we're asking the licensees for, to be publicly available. However, the actual analysis from the licensees is most likely going to have to be protected as some form of sensitive information. I'll let Marshall continue that.

MR. KOHEN: Okay. I guess I would echo some of the thoughts on the security side. There's a similar situation. One of the things that I want to make sure everybody understands, and remind everybody, is obviously NRC has an obligation to conduct a public process through our rulemaking, and we certainly intend, as part of the Part 73 rulemaking, to do that as much as we possibly can.

As Steve said, there will be aspects of the analysis that we do, that we will use to come up with what will eventually be in the regulations, which will be publicly available obviously, that we will not be able to disclose. One thing I want to point out is the major aspect of the Part 73 rulemaking -- well, there are two aspects actually.

One is to infuse, incorporate the orders that we've had to put in place on a case-by-case basis over the last ten years, to make them part of the regulations per se. So we want to get away from regulation by exemption. So we're going to take those orders where possible, and put them into regulation.

They will be part of those orders that are sensitive information of all different types, and they'll have to stay sensitive. That's just the nature of the information. I would also remind people

that we have a graded approach already to security and to MC&A. That is the categorization approach.

So you have Categories 1, 2 and 3, and they are set up based on the attractiveness or the desires of the adversary to acquire that type and quantity of material to use in an improvised nuclear device. What we're attempting to do, by revising the categorization approach, is add some more stratification, and make a little bit more appropriate the physical protection to different types and forms of that material.

So I would say again, we are certainly part of the public approach, and during the Part 73 rulemaking, we will make as much of the analysis and the design of the structure of the categorization approach, and the physical protection measures that we assign to those categories and attractiveness levels, as public as possible, and to the extent that we can do that, we certainly will.

As you probably know, another aspect of both MC&A and security is at least at the nuclear power plants and at the Category 1 facilities, is a design basis threat.

Obviously, the details of those documents are sensitive, and we can't discuss the details of

those. But those are the documents that we use, at least for the Category 1 facilities and for the nuclear power plants, to help us design the security systems and the features that go into those systems.

So there is a rationale. There is an analysis that goes behind the design of those security systems, and it has to do with the category of material that is in those facilities.

MR. CAMERON: Thanks Marshall. Susan, and then Tom. Susan?

MS. CORBETT: I just want some clarification. So what exactly will be classified? You can't tell me what's classified, because it won't be classified. But materials, certain materials will be classified? Actions and procedures or processes are classified? Is that what you're relating to?

MR. KOHEN: I can't give you specific types of information that I know will be classified. I mean there are things that are already protected at classification levels and sensitivity levels that will continue to be that way.

As I say, we have a study going on, and one of the things that that study is considering is a lot of different types and forms of as many types and forms and quantities of special nuclear material that

licensees of the NRC currently hold and are anticipated to hold.

So we're looking at the entire spectrum of materials, to give ourselves the best look at what is a relative set of attractivenesses among those forms and types. Whether those materials, whether we would be able to disclose what those materials and forms and types would be, I can't say at this point.

MS. CORBETT: So basically you wouldn't be able to tell us what's dangerous or how you're protecting us from them?

MR. KOHEN: Well, maybe not to a very, very specific level of detail. But quite honestly, it's already in the categorization approach, and when we develop a new table, what we envision is that types and forms will be in that table, and that will be in the regulation.

MR. WARD: Let me just add to that. NRC, the U.S. government, in fact, as a whole, requires certain kinds of information to be classified, and we don't -- when we generate a document, we look. Does it contain information that is sensitive?

We don't just automatically assume that a certain type of document is going to be classified a certain way. We look at what it actually contains to

determine the appropriate level of classification.

MR. CAMERON: Tom.

MR. CLEMENTS: Well, thank you Chip. I'd like to engage with a little bit of a back and forth, along the same lines, if we could. I have three points I'd like to discuss with you, and this first one definitely might not have to do with risk-informing Parts 73 and 74, but it's just a quick point in the area.

As you know, Information Circular 549 requires of IAEAs is voluntary reporting for plutonium and I guess highly enriched uranium. Do you foresee that the utilities or whoever builds the plant, operates the plant, would essentially be expected to do this voluntary reporting, or would you anticipate that there would be a requirement on a U.S. government level, that the reporting be mandatory for the amounts of material, of plutonium, separated and in process and in spent fuel in storage at the facility?

MR. WARD: Off the top of my head, I'm not 100 percent sure what Info Circ 549 is.

MR. CLEMENTS: It's just a voluntary reporting for most countries that have a commercial weapons grade plutonium stockpile. Some countries do not participate like Sweden and maybe the Netherlands.

MR. WARD: Well we already, in Part 74 even, licensees are required to submit reports on enriched uranium and plutonium to the Nuclear Materials Management and Safeguards System, the NMSS database, and the NMSS database subsequently generates reports on behalf of the U.S. government concerning these materials and quantities and imports and exports and all sorts of other stuff, that are subsequently submitted to the IAEA.

Additionally, Part 75 requires licensees to comply with terms of the Comprehensive Safeguards Agreement and additional protocol reporting requirements. So I'll have to look. It's quite possible that data that NMSS already sends to the IAEA might very well cover this Info Circ 549.

MR. CLEMENTS: But that's voluntary, and I think there perhaps should be something in the regulations to require reporting.

MR. WARD: Well, reporting to NMSS is already required in Part 7413, 7413 and 7415.

MR. CLEMENTS: Okay. Two more points. As you know, I believe it was December last year, Francis Slakey from the American Physical Society, filed a petition with the NRC, that nuclear proliferation assessments be a part of all licensing processes, and

he was mostly directing this to the situation with the development of the laser enrichment facility by GE-Hitachi, I think, in Wilmington.

But it raises a question on reprocessing technologies that might be deployed in the United States. I don't know. I haven't seen any movement on a response to that petition, but where would you see that in Parts 73 or 74 or elsewhere, if there were some requirement.

I think it should be done, because it's rather stunning that there's been no nuclear proliferation assessment required, in the case of this new laser enrichment technology. But where would you see it emerging, if there were to be some requirement to do such a proliferation assessment?

MR. WARD: The issue of whether or not the NRC would start conducting or requiring proliferation assessments, that's a policy issue that the Commission itself is going to have to weigh in on, and I can't really speculate on how their -- what their views are going to be.

Obviously, if they were to direct the staff to require it, that we do it or require the licensee do it, however that might be, then we would have to put that in the regulations somewhere, to make

that required. But it really depends on how the Commission makes their decision.

MR. CLEMENTS: I understand, and one more point on the attractiveness issue. I just want to point out a report done by Brookhaven from July of 2009. I just happen to have a cover here, "Proliferation Risk Reduction Study of Alternative Spent Fuel Processing." I can give this to you if you don't have it.

They looked at COEX, UREX and pyroprocessing, to determine the relevant proliferation risks of each of those. I think the Rokkasho plant, if it ever were to operate after 2-1/2 years of trying to start up, that's a question, separates a mixed plutonium uranium stream.

I don't think there's any difference between the pure plutonium stream and a stream that has uranium in it. This report from Brookhaven says that this evaluation found only a modest improvement in reducing proliferation risks over existing PUREX technologies, and these modest improvements apply primarily for non-state actors.

So I'm curious to know, if you are, in dealing with this attractiveness issue, looking at treating separated materials, uranium and plutonium

from a COEX facility, as different from pure plutonium from a PUREX-type technology. Thank you.

MR. WARD: Well first off, again right now, we don't look at things from a proliferation perspective, unless the Commission, in response to that petition you were talking about a moment ago, directs us to. However, that said, we do look very thoroughly at, you know, the types and forms of materials, part of this attractiveness study.

So that that would certainly be something that we'd look at, you know, how different mixtures may be more or less attractive to an adversary.

MR. KOHEN: Yes, that's right, and that's what I was going to say. Let me add one thing to that, which is you mentioned different forms of plutonium coming from different technologies. One of the things that we're trying to do in Part 73, which is right now focused more on facilities than it is on material, is refocus the discussion onto the actual material itself, and the attractiveness of that material to the adversary.

So I guess I would say that plutonium, in its different forms, is what we're looking at. It really doesn't make a whole lot of difference where it is, what type of technology it comes from, or what

facility it's at. And so I would -- sort of that would be my addition, is that we're really focusing on the types, forms and quantities of material, not necessarily where they're located or where they're stored.

MR. CAMERON: Let's go to Jim and then we'll go to Susan.

MR. BRESEE: I would just suggest, as part of the some of the activities associated with this rulemaking you're currently discussing, that some of the more advanced materials control and accountability work of the Department of Energy might be of some interest to you.

It is aimed very clearly, and I'm talking about the Office of Nuclear Energy, it's aimed very clearly at improved Safeguards for future reprocessing or recycling, reprocessing and recycle facilities in the U.S. It is targeted toward that type of installation, and it does not take the position that somehow, this attractiveness issue eliminates the concern or reduces the concern about the need for Safeguards.

I want to emphasize that there's been too much -- I think there's been a lot of wasted effort in trying to compare and contrast UREX and COEX and PUREX

and various other processes, including the electrochemical, and from the standpoint of does it reduce significantly issues associated with Safeguards and diversion.

I think there has to be a different approach. There are activities that we hope will improve that area, and they're openly published. But I would just urge that there be good, close communications in that area.

MR. CAMERON: Thanks, Jim, and let's go to Susan, and then I have a question for you all.

MS. CORBETT: I don't know exactly how to explain this, but I've read that reprocessing worldwide has created a large inventory stockpiled, because you can't -- they've never been able to feed all of the reprocessed materials back into the MOx program.

So you've got these stockpiles, I think it was the IAEA website that I tallied up the amounts all over the world. It's like 250 metric tons of weapons-usable material. So my question is, is there going to be some consideration in this about if we start getting behind in the MOx processes of fabrication, and we start getting these larger and larger amounts of this weapons-usable material, are we going to stop

until we use that, or are we just going to keep --

Are we going to get into a situation where we've got these larger and larger quantities, which logic would dictate the more you have of something, the more attractive it becomes, and perhaps it is to get ahold of. So is there some going to be an equation about not allowing this stuff to pile up?

MR. WARD: Most NRC licensees, as part of their license, will have what are called possession limits, a maximum amount of different forms of both special nuclear material and other nuclear materials that they are allowed to possess. I imagine that, you know, the license for a reprocessing facility would likewise include possession limits.

That would address that concern. I mean existing licensees have those today, and if they can't ship off material in time, then they have to tell people not to send them more material until they can get that backlog worked through. I anticipate that we would require the same of the reprocessing facility.

(Off mic comment.)

MR. WARD: Possession limits.

(Off mic comment.)

MR. WIDMAYER: Possession limits is part of Part 20. It's kind of fundamental to getting a

license from the NRC. Every licensee has a possession limit. That's fundamental in Part 20, as opposed to --

MS. CORBETT: But will the public know what those possession limits are, or is that classified?

MR. WARD: Most, the vast majority of any facility's license is public, and off the top of my head, I do not know if the possession limits are public. Any of the other NRC staff here might know that off the top of their head. But the vast majority of the license is public, but the few exceptions, usually in the MC&A and security realm, those pipes are classified.

MR. WIDMAYER: I think the possession limit, for example, plutonium, would be something that would be easy for you to find out. That's public information. What form it's in, maybe that's something that you wouldn't be able to know what that is.

MS. CORBETT: I mean because we're talking about something totally new here for us really. This is not like stuff we've done before. So we are looking at a new animal here in reprocessing, so --

MR. WIDMAYER: Yes.

MS. CORBETT: Okay.

MR. CAMERON: Okay, thank you. Rod.

MR. McCULLUM: Yes. If I could speak to that specific question from an industry standpoint, I mean we always consider NRC requirements, you know, the minimum of what we do, and we always seek to exceed NRC requirements, and security is no different than safety.

In fact, you know, while it's true, your possession licenses would restrict the amount of plutonium in various forms you could have, there's an industry aspect to this. I hesitate to use the word marketing, but that's kind of the way it's playing out right now, where the various technologies that are vying for support to develop reprocessing facilities, are looking to market their -- the fact that they will not separate out pure plutonium.

You know, there's variance on the PUREX process that does separate out plutonium, you know, the NUEXs, the COEXs, and it's very likely that the industry will seek, on its own accords, to develop a process which, you know, keeps the plutonium with the neptunium or the uranium or whatever, so that we don't accumulate pure plutonium reserves at all in these facilities.

That's just, in terms of making the technology variable to multiple communities such as yours that are concerned, that's something that industry's going to do for reasons other than regulation.

So I would hope that the first applicant, whenever that occurs, would be able to say we're not relying on a possession license to limit our plutonium, but in fact we don't separate out pure plutonium.

MR. CAMERON: Okay. I just want to make sure that there wasn't some important implications for the rulemaking, from what Jim Bresee just talked about, and I don't really understand what he was saying. But he was saying that an awful lot of -- not because it was Jim, but because it was me, okay.

There was an awful lot of time wasted on trying to remember what you said, and you had some recommendations for Marshall and Steve. Do you know what he was talking about, and is that something that you guys are engaged in?

MR. WARD: We work very closely with DOE and the labs. I believe we have a very good working relationship, and I think Jim's point was well-taken, which is DOE has done a lot of research into material

attractiveness, that we can take advantage of, rather than reinventing the wheel. I know from an MC&A standpoint, we certainly do that. We talk to our counterparts in DOE and try to use them as resources as often as we can.

MR. KOHEN: Yes, and I would say from the security aspect, we work, again, very closely, not only with the DOE and NNSA security organizations, but the weapons community as well.

I think, without prejudicing anything, I think what you'll eventually see when we revise our categorization table, is that it is going to look somewhat, somewhat like DOE's categorization table that it has been using for 20 or 25 years, that it is in the process of potentially revising itself. But there are small tweaks that they're doing to it.

So we're not doing anything that's radically different from what DOE has done over 25 years, and in fact, we have a requirement from the Commission to keep in constant contact with the Department of Energy in doing these things, and we've been doing it all along. So that's not a worry from our side.

MR. CAMERON: Okay, thank you. Just to close the loop on Tom's mention of the petition, is

there anything that could be said about the status of that? Is that still under review, I guess?

MR. WARD: I unfortunately don't know anything about the status of it.

MR. CAMERON: Okay. We talked about the first bullet, and Susan sort of started us on the path of the Diversion Path issues. Is there more to be said by anybody on the second and third bullets, with a Diversion Path Analysis, what should it include, and which documents should NRC consider? Maybe that's a point well-taken from that recent discussion about what Jim was suggesting. Anything that anybody wants to add or question on -- Mark.

MR. YEAGER: With regard to the third bullet, which documents should NRC staff consider to develop the rule language and guidance? As you already probably know, agreement states a few years back had to implement increased controls.

So we kind of went from a regulatory agency that deals with health and safety, to one that had to deal with security, and that involved not weapons grade material but basically material that could be diverted to dirty bombs and dispersal devices.

So we're kind of familiar with the

Diversion Path Analysis, because part of our evaluation of these facilities, and the quantities, were defined by similar to what you brought up Marshall, how much of this material, special nuclear material in the proper forum is attractive.

That's the same thing with us. How much do we need to be worried about, and there's certain licensees that have that. The primary example we have is cesium chloride, which is a very desirable isotope and the form is volatile. So it's something that's desirable.

So what we had to do with our licensees was go through probably a very similar process, in that we had to evaluate the licensee's security, and then based on guidance from NRC, require them to put levels of security in place, to prevent the diversion, and also interdiction and try to foil the adversary, the potential adversary.

And what we do is also proprietary. You know, if you FOIA'd that, we would not be allowed to go into great detail with that with you, because we don't want to compromise what our licensees are doing to protect it.

But my recommendation to you, with regard to the question of what documents, since again, this

is a proposal for a commercial facility, not a facility on DOE property that has inherent security already in place, a commercial facility, I would, you know, ask that you -- because they exist, the processes that you implemented for us regarding increased controls and the requirement to, for a potential applicant to interact with local law enforcement.

So if diversion is successful, what plan is in place to successfully interdict that successful removal from your jurisdiction. Again, it's kind of like a release, but in a different way to our side of the fence. We're concerned about interaction between NRC and the applicant with local and state law enforcement, to ensure that we have a plan in place to successfully foil the potential adversary.

MR. CAMERON: Good comment. Thank you. Thank you, Mark. Anybody else on the second or third bullet? Oh, I'm sorry. Susan.

MS. CORBETT: I was going to add to that, you might want to have some kind of special training for local police around facilities like that, interaction with special training with that too.

MR. YEAGER: Essentially they do that

MS. CORBETT: They do that already?

(Off mic comment.)

MS. CORBETT: Have the Barnwell police been trained?

MR. YEAGER: Yes, they are.

MS. CORBETT: Okay, good. That's good.

MR. YEAGER: There is a relationship, but yes. There is -- if local law enforcement does become part of that increased control plan, we are in touch with them ourselves to provide technical reachback, and the licensee is also there, because they have expertise for technical reachback.

We currently already have working relationships through Homeland Security and DNDO with the state transport police. We're technical reachback for them and SLED. So there's already programs in place that we're involved with, that we periodically go out and work with law enforcement, so they can recognize things.

MR. CAMERON: Okay. How about the fourth bullet? Specific challenges, potential licensee community, in terms of MC&A for Cat 1, of which reprocessing will be one. Rod.

MR. McCULLUM: I just want to reiterate, I actually addressed our concern on the fourth bullet when I talked about the first bullet, that the only

challenge would be is if you don't complete the risk-informing Part 73 and 74 and subcategorization in a timely manner, in front of the reprocessing rule, and you've recategorized as Category 1.

You create a sticking point from somebody trying to develop a reprocessing facility ahead of that. But as long as all of this is sequenced in a logical manner, we don't see any.

MR. CAMERON: Susan.

MS. CORBETT: I think as a potential member of the community, if something does go missing, I would like to know. So is that in the plan?

MR. CAMERON: How does that work?

MR. KOHEN: I guess, let me ask a question back to you. What do you mean by "missing"?

(Laughter.)

MS. CORBETT: If it gets diverted, or material unaccounted for, yes.

MR. KOHEN: Two different things.

MS. CORBETT: Okay. I'm sorry. I'm sitting here, okay.

MR. KOHEN: That's why I asked the question. I'm not sure it changes the answer. There are -- I'm not sure I can answer you specifically, in terms of, you know, how quickly the public would find

out.

Obviously, there are a series of measures that would have to be taken by the licensee, by other organizations to recapture the material, figure out and do nuclear forensics, for example, and where other federal level organizations are involved, even if they weren't, and they would be, there would be a time period that there would be an investigation.

There would be recapture, there would be investigation, and those things, just like in any other type of investigation, and that would not be something that would be released.

But I would say we don't have any evidence, and we have no instances of diversion in this country. So right. So we haven't --

MS. CORBETT: We have to plan for the unprobable.

MR. KOHEN: Absolutely we have plans. That's not to say that we don't have plans. Certainly, we haven't had to exercise them, luckily enough.

MS. CORBETT: That doesn't mean we shouldn't have a plan.

MR. KOHEN: Oh absolutely, and there are. There are contingency plans for every scenario that

we have analyzed, in determining our physical protection structure. So there certainly are contingencies.

MS. CORBETT: Well, that was just my question. As a member of the community, would I be alerted? Is there somebody lose in the community with, you know, a shoe box full of some diverted weapons material?

I mean as a member of the community, I think it might -- I might want to know that and will that be part of the plan? You don't have to tell me now. I just think it should be considered.

MR. CAMERON: Tell her where the shoe box is.

(Simultaneous speaking.)

MR. CLEMENTS: There was no -- there was no diversion of uranium to Israel. Is that NRC's position?

MR. WIDMAYER: We would tell you that it's been diverted in a shoe box, but we can't describe the shoe box to you, and we can't tell you where it is and --

MR. CAMERON: Okay. Is there anything else in this MC&A security arena, in terms of reprocessing facilities, that anybody wants to discuss

at this point? We have the experts here. Anything at all, and anything that Marshall or Steve want to say, in summary on this topic? Derek.

MR. WIDMAYER: Yes, and I don't know how this fits into the big picture. It was just something that jumped out at me that's not here. Maybe the staff didn't find any gaps, and that's one reason why it's not here or anyway, it's the cybersecurity biz.

You know, we're talking about threats to the facility, and this is one of the ones that is somewhat of a new thing. But we're dealing a lot with it at the committee level with nuclear power plants, and that's, you know, wreaking havoc on a facility by hacking into their control systems, as opposed to actually doing it with some sort of physical threat.

MR. CAMERON: Go to Marshall on that

MR. KOHEN: Right. That's a good question. As you know, as many of you probably know, there is a rule now in place since 73.55, 73.56 for cybersecurity for nuclear power plants. We are currently in the process of discussing, within the NRC, how to approach cybersecurity when it comes to fuel cycle facilities.

I won't say it was easy to put the rule in place for nuclear power plants, but one aspect is that

power plants are somewhat similar in their structure, in their systems and components, and we don't find that in the fuel cycle. There's a wide variety of facilities, a wide variety of materials, a wide variety of systems and components, both for safety and security.

And so it's going to take a little bit of thought to figure out how to develop regulations and then guidance in the area of cybersecurity. Rest assured, we understand the threat and we understand that it is ever-changing, and please understand that we are actively engaged in the analysis of how to develop regulations and guidance on cyber for fuel cycle facilities, of which a reprocessing facility would be one.

MR. McCULLUM: So to clarify, any such rulemaking in cybersecurity affecting a reprocessing facility would not occur in this rulemaking; it would occur over in 73-74 space?

MR. KOHEN: I can't say for sure, but I would gather that that's correct.

MR. CAMERON: That's the same model that's followed for reactors.

MR. McCULLUM: That sounds like the right place for it. That's why I wanted to make sure.

MR. CAMERON: Okay. Derek, anything else on cyber?

And Susan?

(Off mic comment.)

MR. CAMERON: Okay. Yes, Bret. Bret Leslie.

DR. LESLIE: Bret Leslie, NRC staff. It's kind of a clarification question, and either Marshall or Rod will be able to address this. Rod, you talked a couple of times about scheduling things.

My recollection is for the risk-informing or the categorization, the Commission in their SRM said that categorization for reprocessing should not be on the same time line as the rest of the rule. Am I misinterpreting, and how does that reflect the time line that Rod seems to be thinking he needs, or wants to be developed?

MR. KOHEN: That is, you've characterized it properly. You've characterized the language in the SRM properly. The Commission did say that we were not to consider categorization of material for the purposes of reprocessing on the same schedule as the Part 73 rulemaking.

Later on in the SRM, there was a discussion of, to the effect of until and unless there

is a serious proposal for a specific reprocessing technology. So that seemed to us to be one of the delimiters, as to when we would do that. Having said that, the materials and the types and forms that would be found at a reprocessing facility are likely to be found at other facilities.

As I said, one of our focuses in the Part 73 rulemaking is to be more on material types, and less on types of facilities.

MR. CAMERON: Does that take care of it? Let's continue out here. We're going to go to Ed, and if you could just introduce yourself.

MR. LAHODA: Ed Lahoda from Westinghouse Electric. I guess the main concern I would have is not the PU or the U and stuff like that. It's the waste and the liquids and everything that are in the plant, being taken from the plant.

Now what are your plans to control that, because as Mr. Yeager pointed out, it's the dirty bombs and stuff like that could be, doesn't take any big technology to do anything with, and it can be just as destructive and economically hurtful?

MR. CAMERON: Yes. How about those types of materials that we don't normally, that are not up on the big horizon? Steve.

MR. WARD: Well first off, under our current regulations, at least for MC&A, there is no real distinguishing feature of waste. If it's at the site and it contains special nuclear material, it is subject to the site's MC&A program. There are cases, there are cases where sites have asked for exemptions due to certain controls and features of the waste.

But there's nothing in regulation right now that separates it. However, the waste, the forms of waste would really fall into the discussion of material attractiveness, and so I'll let Marshall.

MR. KOHEN: Okay. So I guess another thing to point out is that the material categorization scheme currently, and is intended to continue to be, focused on special nuclear material, and that's defined in the regulations. So if it falls into that category of material, then it would be covered by the material categorization scheme.

I guess one other thing I would say, and maybe it's sort of an ancillary point, one of the things that has come down in the last several years is the Department of Homeland Security put out a draft final rules on security of chemicals, and that is something that we are actively working on, how to address.

There was an exception in the rule for NRC facilities, but we recognize that there are some chemicals that are inherent at our licensees that are dangerous, and that we need to protect in some way.

We're currently working with the Department of Homeland Security and eventually we'll be putting up a Commission paper, talking to the -- giving the Commission some information that we, some analysis that we've done on what we think should be done with those chemicals.

So we are considering other things, other than special nuclear material. But within the Part 73 rulemaking, that would be -- it would be relatively minimal.

MR. CAMERON: Okay. Good to know about the Homeland Security chemical thing. Jim?

MR. BRESEE: Yes. Just this particular comment. It probably has wider application, but it's specifically applicable to the issue of diversion detection. In my judgment, the most likely commercial facility involving reprocessing in the future, if there ever is one in this country, will be intimately and directly connected with fuel fabrication.

So that the combined facility is really what would be subject to this type of diversion

control. Certainly, the present situation in France, where plutonium, separated plutonium, is produced at the north end of the country, and used at the south end for that purpose, would be the opposite extreme.

I'm talking about increasingly integrated systems of the future. If that concept is at least in the back of the minds of those who are developing the types of regulatory controls, I think it would be of some value, because it definitely addresses that one most obvious problem associated with current practice.

MR. CAMERON: Thank you, Jim. Alex, you had something you wanted to add.

MR. SCHMUCKMEYER: Thank you very much. My name is Fred Schmuckmeyer. I'm with the public. I was listening to the conversation about ten minutes ago. There was a reference to the Brookhaven report and there was a little bit of discussion about how potential companies that are interested in reprocessing, were coming up with different blends that they thought would be more, how do I say it, less attractive, more proliferation-resistant.

I was just going to ask the panel, I guess it's more industry and NRC, but maybe Tom has some thoughts on this as well, is there any point of -- are there any considerations to find a point where, as you

go from 100 percent plutonium to 100 percent uranium, where there's a point where there's enough of a change in either the isotopic mixture, or in say physical form, co-precipitated versus powders, or fuel rods versus synthoid (ph) pallets, whatever, integrated versus unintegrated facilities, what have you, where some sort of threshold is crossed, where the material is now less attractive from a proliferation perspective.

MR. CAMERON: Thank you, sir. Anybody want to take that? Sven?

MR. BADER: Alex, you're probably aware of the Bathke report, that Dr. Charles Bathke at Los Alamos put together, with what Jim referred to earlier. Yes, AREVA has looked at that report and the amount of uranium that you have to add to the plutonium, I think it was 80 percent had to be uranium. That was not doable in a PUREX-like process that we had envisioned.

So you know, we definitely considered it, and I mean, you know, the COEX process is a process that's AREVA's pursuing to commercialize. We believe that there's really no proliferation-resistant technology available right now.

MR. CAMERON: And Jim is shaking his head

affirmatively on that. What I was going to suggest, we're going to continue to go out to anybody in the audience who wants to talk.

But since we did get sort of a late start, I'm not sure it makes sense to break and then come back, as opposed to continuing with the program, which has last comments around the table when we're done with the audience. Then Jack is going to have something to say to close the meeting out for us. Does anybody have a problem with just pushing through?

MR. McCULLUM: Yes. There's a number of people who have to leave at four to catch flights, including myself. So if we could just press onward, and get through that.

MR. CAMERON: Okay, all right. Audience, let's go, and I think Brandon, you know. Okay.

DR. HAYES: Thank you. Could you please clarify for me why, since the government has decided to go down the path of spent nuclear fuel reprocessing, that the decision has been made to commercialize the process, since we have so many different facilities, federal facilities and personnel, and equipment with extensive backgrounds in nuclear engineering, nuclear chemistry, nuclear physics?

An example would be the H Canyon at SRS, and understanding there would have to be modifications and upgrading to enter into this kind of processing. But I mean the facility is there, and it does have potential.

Secondly, since there's about 60,000 metric tons of spent nuclear fuel in our inventory now, and that's growing by some couple of thousand tons a year, what do you estimate will be the time requirement for utilizing all of that inventory, and will there be additional waste that needs reprocessing in this overall process picture, as the spent nuclear fuel is reprocessed in these commercial facilities?

MR. CAMERON: I don't know who wants to -- Rod wants to address that, and Dr. Hayes made a statement at the beginning about -- of her comment about the government's decision to go down the road on reprocessing. I don't know if that is -- someone might want to address that, and -- go ahead, Rod.

MR. McCULLUM: Yes, and the gentleman from DOE can correct me if I'm wrong, but I'll start out by saying I don't think any such decision has been made. This is being driven by an interest in commercial reprocessing on the part of the industry I represent, and it's more on the federal level and the policy

level, the Blue Ribbon Commission is also looking at it, and the Blue Ribbon Commission agrees that before anybody, be it industry or government, can make decisions about whether or not to move forward with reprocessing, they need to know what the rules are.

I think that's going to come out as a pretty solid Blue Ribbon Commission recommendation. I think that satisfies -- continuing on that path satisfies industry's need to know what the rules are, so we can decide whether or not the entities and industry that are interested in reprocessing can make a business case for doing so.

All of this does not exclude the possibility that existing government facilities might have a role to play in this. They might very well. It's just you'd have to see what entity came forward, who they partnered with, where their funding came from and, you know, all that. So but that's all stuff that can't come together until we know what the rules are.

So yes, there's no decision to go down a path of any sort, and certainly no decision to go down a path that would exclude the use of the resources at a place like Savannah River.

MR. CAMERON: And anything on some of the specific questions that Dr. Hayes had? Anybody have

anything to offer on that? Sven.

MR. BADER: I'll try to add a little bit. I'm not going to make a commercial pitch here, but you know, one of the reasons the commercial industry such as AREVA is interested in doing this is, you know, there's this perception that DOE is involved with the plutonium bomb cycle.

The commercial industry is not involved in that cycle. So if we separate the two and regulate one by a public institution such as the NRC, there's definitely more opportunity for public input.

In addition, AREVA believes we have a better product to offer to what existing facilities are out there, you know, that we -- when I say better, we have the experience in La Hague doing some commercial basis, and we believe that that experience has helped us provide Rokkasho with a path forward, and potential other clients.

MR. CAMERON: Do you want to -- go ahead.

DR. HAYES: I think that one of the issues that might come up in the commercialization of the process versus federal control is that under the federal control, there has been certain commitments made for transparency. If you move this process into the commercialization arena, then proprietary issues

may come up, and the same kind of transparency for the public would become muddied.

I think that's a big public concern. Could you address that, and also could somebody address this thing of, this question of how long it would take to process all this inventory we have?

MR. McCULLUM: Yes, I forgot to -- I'm sorry I didn't. I'll address the last question first. I had forgot to do that when I was addressing your other questions. I mean there is not an intent at this point to reprocess all of the used nuclear fuel that exists out there. Nobody's proposing that. There's 65,000 metric tons. Some of that will go to direct disposal.

Certainly anybody who designs a reprocessing facility is going to design it and have targeted an optimal age range for the fuel. Since whatever age range they pick, whether they want to go after old fuel for certain reasons or new fuel for certain different reasons, you know, it won't make much sense for them to go out and reprocess all kinds of fuel.

So there will be used nuclear fuel that will go directly to a repository, no matter how successful the commercial ventures for reprocessing

are. What was the other question again?

MR. WIDMAYER: How long will it take?

MR. McCULLUM: Well, it will take -- that answer is infinite, because we will not endeavor to reprocess all of it.

MR. CAMERON: The other issue was what are the implications of, that come from proprietary information?

MR. McCULLUM: Oh yes. No, the answer to that is exactly the process we're going through right now. While various competing technologies may have proprietary things, when it goes down, you know, to applying for a license, in the very public NRC process, they will have to demonstrate, in a very public way, exactly what they do to protect public health and safety.

We will not be able, and I don't think we've ever been able to in any NRC licensing process, hide behind the proprietary moniker, to not reveal what we do to make our facilities safe. So I think the answer to assuring that there's the same transparency in a commercial project as there would be in a government project, and I kind of laugh, because I'm not equating DOE with transparency for some reason, but --

(Laughter.)

MR. McCULLUM: To make sure you have the optimal amount of transparency, the answer is participate and do exactly what you're doing today. Participate in the NRC process. Make sure the rule addresses all the things that you need to know, to assure that the safety of your community is protected, and that's how it will be done.

MR. CAMERON: And we're going to go to Brett Klukan. Did I get that?

MR. KLUKAN: You did get it right.

MR. CAMERON: Oh my God.

MR. KLUKAN: This goes to the proprietary comment. We often deal with requests for -- when I say proprietary, I mean commercial secrets or trade information. We get requests from the public, who desire to participate in the adjudicatory process for this.

I've never heard of an instance in which we denied the public a request, assuming those members of the public are willing to sign a non-disclosure agreement. I mean that's a separate issue from security or information withheld because of security concerns.

But the NRC has a pretty transparent

process, and by transparent I mean well-documented process for how the public would gain access to proprietary information in the context of an adjudicatory proceeding, and also through the FOIA process as well.

MR. CAMERON: Thank you, Brett, and Suzanne, do you have anything? Okay. Yes.

MR. MURRAY: Hi. It's Alex Murray again. I picked up the past couple of days, there have been some questions about quantities and time that it might take if you were to reprocess a fuel and so forth. I wanted just to give a very quick perspective, first, on how much spent fuel there is.

There are approximately 65,000 tons. That sounds like a lot of spent fuel. However, if there was a swimming pool the size of a football field, I know it's not football season yet, but it's a good metaphor, okay, that swimming pool could accommodate all of that spent fuel in that football field size in wet storage.

If it were done as dry cast storage, which is what the power plants are transitioning to, it would take somewhere between the equivalent of 25 and 30 football fields to accommodate those 65,000 tons or so, round numbers. So in terms of quantities and

size, it's not that much.

Now the other part, which I want to make clear, is get some perspectives on processing rates and times, if reprocessing were to occur. Right now, there are four, and I'll use the term, modern reprocessing plants in the world, okay. The two at La Hague, one in England and one in Japan.

They're basically built in an 800 to 1,000 ton module, okay. That's just how it worked out. I don't think it was by any sort of pre-planning or pre-thought. It just occurred that way. Given that the U.S. utilities generate between 2,200 and 2,500 tons of spent fuel a year, you would need three of those plants just to break even with the current generation of spent fuel, if you were to reprocess all of it.

If you have a backlog of 65,000 tons, you would need 25 years, something like that, 30 years to work through that backlog, with three additional plants of that size, just to put it in perspective. That's why industry and the Department of Energy might decide hey, you don't do all of it or you do part of it or something. But it's up to them. We're just the regulated. Thank you.

MR. CAMERON: Thank you. Okay, thanks Alex for that information. I think we're ready to go

to see if there's final comments around the table on the entire meeting, on any part of the meeting, and then we're going to hear from Jack Davis. Mark, you mind if we start with you down here? Okay.

MR. YEAGER: I really don't have any specific comments. I just would like to thank Chip for inviting South Carolina to participate. I've certainly learned a lot, and I'll take a lot back to work and share with our management, and also be giving the report to the board at CRCPB. So it was a very enlightening experience, and I appreciate it.

MR. CAMERON: Great, and Kevin, we're just going around to see if -- give people a chance to make any comments they have about the process or put anything on the table on any particular issue, whatever. So go ahead.

MR. STRICKLAND: Well, that was a certainly enlightening experiment, to hear everybody's perspective on this, and I don't really have anything additional to add on it. But I'd like to thank everybody for their comments and their time.

MR. CAMERON: And Rod?

MR. McCULLUM: Yes. I just want to start by thanking, you know, the NRC and Chip for putting this on. This is the right way to do rulemaking.

This has been extremely helpful for us. The document provided and the discussion we've had have been an excellent window into where NRC is in its thought processes, and it provided an excellent opportunity for us to provide comments.

This is the third in a series of workshops. We look forward to moving to the next step. We think that NRC has a good path forward. We're pleased that you've embraced the Part 7X philosophy, and recognize that this regulation falls into between reactors and fuel cycle facilities. We're pleased that NRC has embraced the risk-informed performance based technology neutral approach.

The plan to address gaps appears to be the right, you're looking at the right gaps, and you are addressing them. There are obviously some things we disagree on. We've had a chance to state those. We will be following up this meeting with a written comment letter by July 7th.

The most significant of those is the safety analysis methodology questions. Of course, We have our letter out there with our white paper on ISA, which we believe is the preferred method. The reason that's the most important is because that really drives a lot of the other things. You know, this

regulation, to be risk-informed and performance-based, it needs to be driven by the safety analysis. So we have to get that piece right.

I think you heard both from the industry and other stakeholders that a one-step-only approach is not preferred. Very important that this be a holistic rule, that you not have interfaces between regulations inside the facility, and the facility be broadly defined.

I think as Jim just mentioned, you know, you put the fuel fabrication with the separation. You would not want to have Part 72 facilities inside Part 7X facilities. So making sure you have a holistic regulation. There are also things that I think we agree in principle on, but more work is needed to be done, which can be done further down in the rulemaking process, details on GDC and the specific Price Anderson framework are just a couple of examples.

The final thing I'll say is because this is a critical path to decision-making, the Blue Ribbon Commission agrees with this, that whatever decisions and whenever the United States makes those decisions about reprocessing, recycling plutonium recovery, whatever you want to call it, those decisions cannot be made without the rule being in place.

So until NRC completes this rulemaking, the country is forever in a stalemate on the issue of should we do this or shouldn't we, and for that reason, we would hope that NRC would hold to its 2015 schedule. We're concerned to hear that funding may cause that slip now to 2017. So we're encouraging the effort to continue on the path it's on, and we'd like for it to continue on the pace that it's on as well.

MR. CAMERON: Thank you, Rod. I'm going to keep going with the external participants, and we'll go to see if any of the NRC staff, before we hear from Jack, have anything final to add on this, and that the staff did a great job, throughout the two days, on their presentations.

Let's go to Sven and I'm counting Derek in as external, external to the staff. Sven?

MR. BADER: I appreciate that. I think, you know, what Rod stated for industry applies to me as well. You have the schedules are one thing. I think that it's the most significant impact to us, to make an economic assessment of moving forward on this, you know, as well as keeping a holistic approach, being able to license the facility for the multiple different facilities that we might have there, such as spent fuel pool or dry storage area, a set-down area,

a high level waste storage and so forth.

I think if you look at it in an integrated process, I think what we're trying to achieve in the United States is moving back to an integrated process, looking at the whole cycle, the whole fuel cycle. We believe, AREVA believes that this is one of the main features of that integrated cycle.

I would like to caveat a little bit of this one-step, two-step. Yes, AREVA's definitely interested in a one-step approach. I'm not sure that the first facility would fall under that category. But definitely if it were future facilities, that would be something that we're going to take advantage of.

We'd like to then believe that we do have -- well, we don't believe. We actually do have operating facilities around the world. We're involved in, you know, we run a facility La Hague, through design. We're trying to help Sellafield. We have helped Rokkasho, and yes, certainly Rokkasho's had some problem, but I think they're going to push through as well. If you hadn't heard, it was a vitrification (ph) problem.

Once they've pushed through that, hopefully their fuel fabrication facility will get

built. Of course, everything at Fukushima has turned that all, a little bit in doubt. Otherwise, you know, again, I appreciate the invitation and I hope next time maybe we'll get a little more leeway, a little more advance warning.

MR. CAMERON: Okay.

MR. BADER: Thanks.

MR. CAMERON: Thank you. Derek.

MR. WIDMAYER: Thanks. I guess sort of repeating fundamentals of my initial caveats. I don't represent the Committee and I was asked to come, representing the staff. In that regard, I did ask for some help in preparation for the meeting, and myself and the other staff person who reviewed the materials, we thought that the gap analysis was well done, and that it asked the right questions.

We think that the staff did a good job in putting that together, and that that was a good first, fundamental step in, you know, doing this proposed rulemaking, getting to the part where you do actual rulemaking. Then the second thing was that from the Committee's standpoint, to echo two things that were brought up at a meeting.

One was that I think it definitely would be in support of a two-step process for licensing, at

least for the initial facility, whatever it is, that we're talking about. Then was the safety analysis question. The Committee has been on record for a while, and remains on record, that it would like to see some sort of PRA-type analysis that helps you prioritize your inspection process in particular.

So I think, as I reported before, the hybrid approach that's being discussed, and the gap analysis, I think, is workable, you know. They have to see how it plays out.

In that regard, I would suggest that coming to the Committee, the earlier, the better, as far as whatever approach you were going to take in explaining along the way to the Committee members, particularly in trying to get agreement of those particular members who are very focused on PRA.

MR. CAMERON: Thank you. Thank you, Derek, and Jim.

MR. BRESEE: Thanks for the opportunity to participate. I was privileged to be involved in the first of these three meetings, and I must say, I was very impressed with the progress that has been made, and I look forward to any additional help that the fuel cycle research program can provide in future activities involved with this rulemaking process.

Thanks also to a very well-organized meeting and all the work that went into the two days that we've had here.

MR. CAMERON: Thank you, and Tom, let's go to you.

MR. CLEMENTS: This is Tom Clements with Friends of the Earth. I hesitated to participate in this panel, first not knowing if I had anything to contribute, and for some other reasons. But I'm glad I did. I personally learned some things, and appreciated the interaction with everyone here, and thanks to you, Chip, and the staff.

I do think that this exercise is an academic exercise, rather than one that's going to lead to reprocessing plants being constructed. So I see no need to put this development of the regulations on a fast track, and don't see the need for making sure that there's a larger budget to do this.

As we look around the world, with the reprocessing plants that Alex mentioned and some others, I think it's quite instructive to look at the British situation, where the Thorp plant and the Sellafield MOx plant have been really utter disasters. They've not performed anywhere near planning for them. No plutonium has been reused. No uranium has been

reused that's been separated.

The Russian facility, RT1, no plutonium has been reused. After all these years and maybe 35 metrics tons were accumulated, no reprocessed uranium has been reused. Rokkasho is in some trouble, and we have the West Valley experience here in the United States and Savannah River site.

There really, the MOx program is showing that there's great hesitancy in the United States to use MOx in light water reactors. Other reactors don't exist. The reprocessing technologies are up in the air. So I think a slow pace towards developing regulations is certainly called for, and I would certainly support that.

I've been watching this from afar, but it's good to be a little bit more up close, and I'll continue to monitor it here from South Carolina, because we are concerned that we may be a focus of location of a reprocessing plant. So from a public interest perspective and public perspective, I will be discussing this with more people around here as things proceed. But I appreciate the opportunity to be here today. Thank you.

MR. CAMERON: Thank you, Tom, and Susan?

MS. CORBETT: Thank you, and I really

appreciate being invited to participate in this. As a lay person, I have learned a tremendous amount, and I appreciate your tolerance of my sometimes maybe stupid questions. But I think it's always good to have a lay person from the community at the table, to ask questions that the public may want to know.

Like Tom and Mary, I had some reservations about this, because I feel like I'm kind of constructing the tent for the camel to stick his nose in. But I guess if there's going to be a tent, I would want to be a part of putting it up, so I can keep an eye on that camel.

Because we are very suspicious of moving towards a plutonium economy. We have Sierra Club, we're talking about Sierra Club. We have never felt that we want to make plutonium the energy coin of the realm, and we're very concerned about that. We're very concerned about the costs of reprocessing.

Worldwide, it's just an enormous cost, and we don't know in this economy how that would get funded. We're concerned about creating more waste, even though as it's supposed to be reducing it. Actually, we know for our experiences at Savannah River site, that there's a tremendous legacy of waste that require an enormous amount of effort to clean up

and deal with.

We're concerned about proliferation risks, and I'm afraid in my lifetime or in my children's lifetime or my grandchildren, we're going to see the repercussions of stockpiled weapons, usable materials somewhere in the world. Hopefully not here, but who knows?

We think the better solution is to go to hardened on site storage and get busy finding a geologic repository based on good science and not on politics. It's obviously going to have to more than one. We think if we're going to go forward with nuclear power, that's the only way. The once through is the only way to do that.

But thank you all. I've really enjoyed meeting all of you, and I appreciate the opportunity to be here.

MR. CAMERON: Thank you, Susan, and does anybody on the NRC staff want to offer something. Let's find that out, and then we'll see if there's any last public statements, and then we're going to have Jack come up. Bret Leslie.

DR. LESLIE: Bret Leslie, NRC staff. I said right before lunch that there were a couple of things that I had wanted to ask, when we were talking

about safety and that discussion. Basically, it concerns Gap 5. We're touching around the edges of it, and if you read the summary, it doesn't -- I don't think we touched on it well enough.

Reactor side, all licensees have a regulatory limit, dose limit. Reactor side has a safety goal policy. NMSS and Waste Arena has quantitative health guidelines that are captured in the risk-informed decision-making document for materials and waste, and I don't think it's tied directly on our website for reprocessing, but we'll get it up there.

But that discussion in there, in terms of criteria, it's about the lower side. So I think part of the discussion that we didn't -- talking about ALARA and driving down, that was about accident sequences. When do you -- what's the bottom?

So I guess for a little, I would suggest people go back and read that after you go look at the risk-informed decision-making document, because we've been told to consider these as we go forward, and that maybe didn't come out well enough in our slides. But I did want to let everyone know about that. Thanks.

MR. CAMERON: Thanks, Bret, for that reminder on that. Let's go to Yawar.

MR. FARAZ: Yes. I found this meeting to be very, very helpful, to myself, I think. We got some very good input from the stakeholders. At least compared to the last two workshops, I think this was a lot more productive. I'm happy to hear that NEI will be submitting its written comments on our summary document that we've put out, and what we've discussed in this meeting.

I would strongly encourage the other stakeholders to also submit their input, and base their input, you know, primarily on the summary document that we've put out. You know, go through it and see if there's anything in there that you would like to add, or some things in there that don't make sense to you.

I would really very strongly recommend that you do that. We've used this meeting to try and get as much as we can, and I don't think we were diligent enough to cover all areas. We may not have been. So I would very, strongly encourage you to go back and look at the summary document and go through it very carefully, and then provide any other feedback that you think is needed.

MR. CAMERON: Okay, thanks Yawar, and I would just thank all of the members of the public who

came and listened, and also offered comments during the meeting. So thank you very much. Jack, I think we'll turn it over to you, and the table, podium. All right.

MR. DAVIS: Well, I wanted to thank all of the panel participants, as well as the members of the audience, for their active participation in the discussions over the last two days. I think it's been extremely useful to me and certainly to the NRC staff, as you heard a few of them have already commented to you.

Taking over leadership of this activity about a year ago, I thought by now I pretty well understood the issues at hand. But it's always interesting to me that every time I come to another public meeting, I either look at something with a different nuance, or I look at it from a different perspective.

I can't tell you how important those different perspectives are to producing a very robust rule that's protective of public health and safety and the environment. You've heard us say that we've held three public meetings over the last year in this particular area, one in D.C., one out west, and one here.

I know a few times it was mentioned that well, we picked this area, because we think that there's going to be a reprocessing facility here. That's not the case. We picked this area because we knew that this was a very knowledgeable nuclear community, that could give us very valuable input to reprocessing.

They understand these types of issues. They understand waste management, and we could get a much better diverse view on how to do this rule, if and when the Commission decides to do so. That said, I do owe the Commission a recommendation for rulemaking this September.

If they choose to go ahead and go forward with a recommendation that says yes, we would pursue a rulemaking, they'll be additional ample opportunities for the public and for other panel members as yourself to participate in help shaping that rule, so that it is protective of the public.

I, at least, let me say it that way, I heard very strong interest in holding additional specific meetings on general design criteria and technical specifications. I heard about NRC working with EPA and working with DOE in a very open manner to resolve some of these complex technical issues, and

we'll take that back.

Finally, I think I'd be remiss if I didn't say that I also heard the significant emotional response to this particular topic. That wasn't lost on me. I think it helps to personalize the whole subject area, that this is an important safety thing that we're doing. It's not just us as a regulator, right?

It's the licensee. It's the industry, the regulator, the state regulators, the other public interest groups. I mean after all, at the end of the day, who's the public that we're protecting? Us, right. Our mothers, our fathers, our sisters, our brothers, our friends.

We shouldn't lose sight of that. We need to do this as best as we possibly can. As you said, if we're going to do it, then we ought to do it in a very safe manner. I'd like to also extend my thanks to Chip as the facilitator.

(Applause.)

MR. DAVIS: I think -- absolutely. I think everyone recognizes that facilitation, there's an art to it, and every time I've been in a meeting where Chip has facilitated, it's like a masterpiece, and I'm being honest.

MR. CAMERON: That beer is going to taste good tonight.

(Laughter.)

MR. DAVIS: I'll buy the first couple of rounds. Then also my thanks to Miriam as well. As you're probably all aware, a huge amount of planning goes into putting together one of these remote meetings.

Miriam has done that, you know, hands-off, if you will. I mean she's worked behind the scenes very extensively to bring the right people to the table, get the meeting location and so on. It's a lot of effort, and I really thank you for your professionalism.

(Applause.)

MR. DAVIS: Last, I would just say that we're going to hold an open house shortly after this meeting, and I'll be available to talk with anyone, as well as other members of the NRC staff and the Center staff. Thank you.

(Whereupon, at 3:42 p.m., the meeting was adjourned.)