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U.S. NUCLEAR REGULATORY COMMISSION

# BRIEFING ON THE FINAL REPORT OF THE BLUE RIBBON COMMISSION ON AMERICA'S NUCLEAR FUTURE

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TRANSCRIPT OF PROCEEDINGS

Public Meeting

Before the U.S. Nuclear Regulatory Commission:

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Kristine L. Svinicki, Commissioner

William D. Magwood, IV, Commissioner

William C. Ostendorff, Commissioner

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P R O C E E D I N G S

CHAIRMAN JACZKO: Well, good afternoon, everyone. We're meeting today to talk with representatives of the Blue Ribbon Commission on America's Nuclear Future, as well as to hear from the NRC staff. This meeting offers an important opportunity for the agency to discuss in detail the comprehensive recommendations that the Blue Ribbon Commission made to Energy Secretary Chu this past January. This report is the culmination of nearly two years of work by the Commission in developing recommendations for creating a safe, long-term solution for managing and disposing of the nation's spent nuclear fuel and high-level radioactive waste. And we're very thrilled to have General Brent Scowcroft here today to talk about the report and I think it's very important for us to hear directly from the Commission on its eight key recommendations and their possible implications.

Many of these recommendations require action by the Administration and Congress, but the path and progress of these efforts will have significant implications on the Nuclear Regulatory Commission. The more we know going forward, the better we can plan ahead. So the issues of permanent storage for spent nuclear fuel are very important for the country, and we look forward to a very interesting discussion today. I'd offer my colleagues an opportunity to make any remarks if they would like. Okay, general, we'll turn it over to you and your presentation.

GENERAL SCOWCROFT: Thank you very much, Mr. Chairman. Chairman Jaczko, Commissioners, it's a great pleasure for me to be here today with you to discuss the final recommendations of the Blue Ribbon Commission on America's Nuclear Future. We understand the challenge of the regulator’s

role, and we certainly appreciate the excellent job you all are doing to ensure the safety of our nation's fleet of commercial nuclear reactors.

Before we begin, I would like to pass along Co-Chairman Hamilton's regret for not being able to be with us today. I would also like to thank the rest of the members of our Commission who worked so hard in creating a final report. As I know you are all aware, the Blue Ribbon Commission was formed under Secretary of Energy at the direction of the President. Our charge was to conduct a comprehensive review of policies for managing the back-end of the nuclear fuel cycle and to recommend a new strategy.

We delivered our report to Secretary Chu on January 26 of this year, and the DOE has begun their efforts to implement our recommendations. Today, instead of walking through these recommendations in great detail, I will briefly discuss the eight key elements of our recommendations, highlighting the areas in which we believe the NRC has an important role to play.

Our first recommendation is that we need a new consent-based approach to siting future nuclear waste management facilities. Experience in the United States and in other nations suggests that any attempt to force a top-down, federally-mandated solution over the objections of a state and a community far from being more efficient, will take longer, cost more and have lower odds of ultimate success. By contrast, the approach we recommend is explicitly adaptive, staged, and consent-based, based on activities in the United States and abroad including most notably, the siting of a disposal facility for transuranic radioactive waste, the Waste Isolation Pilot Plant, or WIPP, in New Mexico, and recent positive outcomes in Spain, Finland and Sweden. We believe this type of approach can provide the flexibility and sustain the public trust and confidence

needed to see controversial facilities through to completion.

Our second recommendation is for a new organization dedicated solely to implementing the waste management program and empowered with the authority and resources to succeed. The overall record of the Department of Energy and of the federal government as a whole has not inspired confidence or trust in our nation's nuclear waste management program. For this and other reasons, the Commission concludes that new institutional leadership is needed. Specifically, we believe a single-purpose, Congressionally-chartered federal corporation is best suited to provide the stability, focus and credibility needed to get the waste program back on track.

Let me add that the presence of clearly independent, competent regulators is essential. We recommend the existing roles of the Nuclear Regulatory Commission in licensing and regulating waste management facilities, and the U.S. Environmental Protection Agency in establishing standards to be preserved -- be preserved, but that steps taken to ensure ongoing cooperation and coordinating coordination between these two agencies.

Our third recommendation is that access to the fund's nuclear utility rate payers are providing for the purpose of nuclear waste management. Nuclear utilities are assessed a fee on every kilowatt hour of nuclear-generated electricity in exchange for the federal government's contractual commitment to begin accepting commercial spent fuel beginning by January 31, 1998. The fee revenues go to the government's nuclear waste fund, which unfortunately does not work as intended. A series of executive branch and Congressional actions has made annual fee revenues approximately $750 million a year and the unspent $27 billion balance in the fund effectively inaccessible to the waste

program. This situation must be remedied immediately to allow the program to succeed.

Recommendation Number 4 is to begin prompt efforts to develop one or more geologic disposal facilities. The conclusion that disposal is needed and that deep geologic disposal is a scientifically-preferred approach had been reached by every expert panel that has looked at the issue and by every other country that is pursuing a nuclear waste management program. Moreover, all spent fuel reprocessing or recycle options either all are either already available or under active development at the time still generate waste streams that require a permanent disposal solution.

In support of this effort, we recommend that the Environmental Protection Agency and the Nuclear Regulatory Commission develop a generic disposal standard and supporting regulatory requirements early in the siting process. Generally applicable regulations are more likely to earn public confidence than site-specific standards. In addition, having a generic standard will support the efficient consideration and examination of multiple sites. Likewise, EPA and the NRC should begin work on a regulatory framework for borehole disposal in parallel with their development of a site-independent safety standard for mine geologic repositories in order to support the RD&D effort leading to license demonstration of the borehole concept.

Regarding Yucca Mountain, we simply note that regardless of that project's fate, the U.S. inventory of spent nuclear fuel will soon exceed the amount that can be legally in place there until a second repository is in operation. So under current law, the United States will need to find a new disposal site even if Yucca Mountain goes forward. We believe the approach set forth here

provides the best strategy for assuring continued progress regardless of the fate of Yucca Mountain.

Recommendation Number 5 is to begin prompt efforts to develop one or more consolidated storage facilities. This is storage, as opposed to disposal. Developing consolidated storage capacity would allow the federal government to begin the orderly transfer of spent fuel from reactor sites to safe and secure centralized facilities independent of the schedule for operating a permanent repository. The arguments in favor of consolidated storage are strongest for stranded spent fuel from shut-down plant sites, of which there are 10 across the country. Stranded fuel should be first in line for transfer to a consolidated facility so that these plant sites can be completely decommissioned and put to other beneficial use. Even with the timely development of consolidated storage facilities, a large quantity of spent fuel will remain at reactor sites for many decades before it can be accepted by the federal waste management program. Current at-reactor storage practices and the safeguards are being scrutinized in light of the lessons that are emerging from the Fukushima disaster.

As you know, the Commission recommended that the National Academy of Sciences conduct a thorough assessment of the lessons learned from Fukushima and their implications for conclusions reached in earlier NAS studies on the safety and security of current storage arrangements for spent nuclear fuel and high-level waste in the United States. We understand that Congress directed the NRC to establish a contract with the National Academy of Sciences for this study and that this work is moving ahead. We certainly believe this effort will complement investigations already underway by the NRC and other

organizations.

Recommendation Number 6 is efforts to prepare for the eventual large-scale transport of spent nuclear fuel and high-level waste to consolidated storage and disposal facilities when such facilities become available. The current system of standards and regulations governing the transport of spent fuel and other nuclear materials appear to have functioned very well, and the safety record for past shipments of these types of materials is excellent. That being said, the greater transport demands for nuclear materials are likely to raise new public concerns. The Commission believes that state, tribal, and local officials should be extensively involved in transportation planning and should be given the resources necessary to discharge their roles and obligations in this arena. Historically, some programs have treated transportation planning as an afterthought. No successful programs have done so.

Recommendation Number 7 is support for advances in nuclear energy technology and for workforce development. Advances in nuclear energy technology have the potential to deliver an array of benefits across a wide range of energy policy goals. The Commission believes these benefits justify sustained public- and private-sector support for RD&D on both existing light-water reactor technology and advanced reactor and fuel cycle technologies. We believe the NRC should increase its efforts in developing regulatory frameworks for advanced nuclear energy systems. Such frameworks can help guide the design of new systems and lower barriers to commercial investment by increasing confidence that new systems can be successfully licensed.

Specifically, the Commission recommends that adequate federal funding be provided to the NRC to support a robust effort in this area. We also

support the NRC's risk-informed, performance-based approach to developing regulations for advanced nuclear energy systems, including NRC's ongoing review of the current waste classification system.

Active U.S. leadership, the last recommendation is that active U.S. leadership in international efforts to address safety, non-proliferation, and security concerns continue. As more nations consider pursuing nuclear energy or expanding their nuclear programs, U.S. leadership is urgently needed on issues of safety, non-proliferation, and counter-terrorism. Domestically, evolving terrorism threats and security risks must be closely monitored by the NRC, the Department of Homeland Security, and other responsible agencies to ensure that any additional security measures needed to counter those threats are identified and promptly implemented. The events at Fukushima have – as they should – prompted the NRC and the industry to re-examine the adequacy of "mitigative strategies" for coping with large-scale events or catastrophic failures, and we support the ongoing efforts the NRC is taking in response to Fukushima.

In conclusion, the problem of nuclear waste may be unique in the sense that there is wide agreement about the outlines of the solution. Simply put, we know what we have to do, we know we have to do it, and we even know how to do it. The national interest demands that our nuclear waste program be fixed. Complacency with a failed nuclear waste management system is not an option and the status quo is not acceptable. The need for a new strategy is urgent, and we urge the Administration and Congress to proceed without further delay.

We know that you, the dedicated and talented Commissioners and staff of the NRC, have an important role to play in supporting this new strategy,

and we hope that you will move ahead with the same diligence and professionalism that you're known for worldwide. Thank you for having me here today, and we look forward to your questions.

CHAIRMAN JACZKO: Well thank you that that presentation, and we'll begin our questions with Commissioner Svinicki.

COMMISSIONER SVINICKI: Well good morning again and welcome General Scowcroft, and you've been joined here at the table with some fellow experts. I want to begin by complementing you, your co-chair and other members of your Blue Ribbon Commission for the really thorough and dedicated work and I was monitoring all the meetings you held and all the testimony that you received over the course of the period of time that you developed, first your draft, and then your final report, and I think that most of us have been around Washington long enough to know there are a lot of commissions established and others who do produce reports, but again I want to single out and compliment the thorough and really robust work that you did on these issues. So, even as an informed constituent, I really enjoyed reading the report, and I found a lot of valuable content that I think will advance the public policy debate on these important issues.

I focus, not surprisingly, you have a chapter ten on regulatory issues, and that was where I focused a lot of my review and looking over of the work that you had done. I do have a few questions, in most cases I'm looking for maybe a little bit more basis and understanding for what experts you heard from, what testimony you received that would've caused you either to make a recommendation or suggestion for the future, and I think it would be helpful to me and to our reporter here if you call on any of your fellow experts here to respond,

if they could identify themselves, that way we can be certain to have that in the record.

The first topic that I was going to ask about was the concept of approaching regulatory standards for a disposal facility in a way that would recognize and facilitate what you call, “an adaptive, staged approach to development.” I think that in the second panel this morning, we will hear from the NRC's technical experts that the way we license is to set out a standard that is well-defined and then receive some sort of application and license to a pre-determined, quantified standard. It seems to me what your Commission is suggesting is that because the time frames often for development of disposal facilities are very prolonged, that it would be helpful if the regulatory process could recognize that we could have more of a staged development of a disposal facility and more of an adaptive approach to determining its adequacy to serve as a disposal facility. And so, I think that it might be that NRC this would be somewhat unnatural to us in terms of how we license things. Could you talk a little bit more about what the Commission is recommending there and why you arrived at that recommendation?

GENERAL SCOWCROFT: Yes, certainly. I think our adaptive approach is that we want to encourage local areas to come forward and say, “We're interested.” But in order to do that, we need to have a general framework for the areas that would be suitable for a disposal facility. And if you wait until they come forward before you have any criteria, we thought that would lengthen the process inordinately, so what we'd like to see is sort of a template approach, and if you meet the template, it might not include every particular detail of local terrain, but enough to reduce the number of communities who have the right kind

of facilities to be considered. So it's a way to expedite it, it's not a way to make you try to change the way you approach things because in the end, every facility would have to have the kind of detail approach that you have.

THOMAS COTTON: Thomas Cotton, I'm a consultant to the Commission. In the specific issue of the staged development, the Commission looked at, particularly at the National Academy study, the 2001, one step at a time, and recognized that there was a lot of interaction with the Commission on that, and that the, I recall that the Commission had argued that in fact the regulations do allow modifications and changes in the license during the course of development. And the recommendation here was just that this be very explicit, that the in the promulgation of near regulation, the issue of development of a repository in a stepwise manner that may involve changing of the design of the facility or change from the original plan be recognized as something that would occur, that could occur and that there's no obstacle in the regulation to allowing that to happen. It wasn't -- there was no contemplation that there would be changes in the standard, evolution of the standard, more that the process itself facilitate an ability to re-examine what's being done and decision perhaps to change some path forward.

COMMISSIONER SVINICKI: Okay, well that's very helpful input. I think I was perhaps thinking there might be a bit of tension there with another issue that the Blue Ribbon Commission had identified, which was that there are public concerns if it looks like the standard is set based on the desire to site a facility somewhere. So it sounds like what you're describing is not so much that it's an open-ended standard and I think from what General Scowcroft said, it would be more of a top-level kind of a screening process with further detail as

you move forward.

THOMAS COTTON: Right.

COMMISSIONER SVINICKI: Okay, thank you for that. Again, creating some tension I think was the explicit recommendation to begin work on regulatory framework and standards for deep borehole facilities. I'm of course aware that there are other countries that have pursued deep borehole and that it does hold some promise as a potential disposal approach. Can you help me understand, again, what experiences or testimony you heard about that caused you to very explicitly identify deep borehole, and again very candidly, there is also discussion in your report about the fact that you were not a siting Commission and you were not looking to identify either regions or particular types of geologies, yet on deep borehole approaches you were very explicit. Is there any additional information you could provide about why you felt strongly about that?

GENERAL SCOWCROFT: I'll confess, I did not feel strongly about it, so --

[laughter]

GENERAL SCOWCROFT: I'll turn to the staff for help on that one.

THOMAS COTTON: You're going to leave this one to me? Matt?

MATTHEW MILAZZO: I'm Matt Milazzo, the deputy staff director of the Commission. I would just say that we had, you know there's 15 Commissioners on, you know, for the Commission, and there were some Commissioners that did feel, as the General brought up he was not one of them, but there were several Commissioners that did feel that borehole offered -- I think you got it right when you said, you know, more options for you know, where they

could be located. And I think that they were interested in giving disposal a broader range of where things could be located. So, I think that was the real reason they were supportive, but I don't want to specifically name commissioners that were supportive, but there were several that were.

COMMISSIONER SVINICKI: Would it be fair to say that that recommendation is not intended to say that other disposal or other geologies or other disposal approaches were assessed and yet not found promising by the Commission, or is it more that deep borehole, based on other international experiences, was simply felt to be promising enough that standards for that should begin to, it's not meant as a disqualification of other things.

MATTHEW MILAZZO: That's correct.

COMMISSIONER SVINICKI: Okay, thank you. And there was some discussion again in the regulatory chapter about occupational safety and health, and I was curious, there was a note in the final report indicating that a white paper had been developed for the Blue Ribbon Commission, and it found that the U.S. nuclear industry has a much better occupational safety record than other parts of the energy sector. And yet, there was still some discussion in your report about the fact that since a deep geologic disposal facility has not been developed in this country, we lack some experience on any occupational safety issues. Was there anything in particular in the presentations or testimony you heard that you developed some concerns about occupational safety issues in a disposal site? And I will also say that you acknowledge in your report that many of the occupational hazards would be very akin to any type of deep mining activity.

GENERAL SCOWCROFT: I don't recall anything specific, but there

was a general concern that in the lack of movement in the nuclear power industry, that expertise was vanishing, and we've had to turn to a lot of foreign nationals, and so on. And I think that it was more generic --

COMMISSIONER SVINICKI: Okay.

GENERAL SCOWCROFT: -- than that, a concern that we, while we were going forward trying to renew things; we had to be aware that there was a paucity of trained people in the nuclear field.

COMMISSIONER SVINICKI: Okay, thank you. And in my time remaining, I'll just close by saying also your Commission had a lot of discussion of waste classification systems. I just want to acknowledge that, first of all, I want to thank the Blue Ribbon Commission for acknowledging some of the initiatives that NRC already has underway to look at, what I call “re-rationalizing and better risk informing waste classification system,” so I appreciate that your Commission took that on. I think it's a really important topic. I don't really have any questions on it, but I think that in the communities of practice and exports, there's a lot of acknowledgment that we could much better risk-inform those areas, so I want to thank you for your work on that.

GENERAL SCOWCROFT: Well, thank you. We thought that was a very important issue. It's a complicated issue because you, some of it's government-owned, some of it's industry-owned and so, the jurisdiction is one thing that has to be considered every time, but a risk-based system is badly needed.

COMMISSIONER SVINICKI: Okay, thank you. Thank you Mr. Chairman.

CHAIRMAN JACZKO: Commissioner Magwood.

COMMISSIONER MAGWOOD: Thank you, Chairman. Again, welcome General Scowcroft --

GENERAL SCOWCROFT: Thank you.

COMMISSIONER MAGWOOD: -- pleasure to have you here. You know it is often missed I think by people outside the beltway that Washington has a reservoir of highly experienced people that we can call upon to take on these tough assignments, and you are certainly one of them, so I really appreciate you taking this on, and Mr. Hamilton as well.

GENERAL SCOWCROFT: Thank you.

COMMISSIONER MAGWOOD: And I also hope you were able to come together again as co-chairs to lead the Blue Ribbon Commission on pollen removal from the atmosphere because those of us that are suffering from allergies would love to see some solutions to that problem as well. Also, let me welcome your staff, particularly Tim, it's good to see you. Tim and I worked together for a long time at DOE, and he's also one of those people that get all the really fun assignments, so you know I'm sure he enjoyed working with you on this.

GENERAL SCOWCROFT: We depended so heavily on the staff, Mr. Commissioner.

COMMISSIONER MAGWOOD: Yeah, and General Kotek as well who is not here today, someone else I worked with very closely. I know he was very excited to be part of this endeavor, so again, thank you for the work. A few questions: one thing is as I went through the report, of course, given my background, the first thing I did was go right to advanced technology section. And I talked with some Commission members about some of this, but I wanted to

hear your views on it because there were a few things about it that I found rather, I'm not sure I would use the word "surprising," but things that really prompted other questions. And there's a highlighted quote that I wanted to read. It says that, "No currently available or reasonably foreseeable reactor in fuel cycle technology development including advances in reprocessing and recycling technologies have the potential to fundamentally alter the waste management challenge this nation confronts, at least over at least the next several decades, if not longer."

And I wanted to ask you to talk about that a bit, because there clearly are technologies that really would be significantly game-changers in terms of reducing toxicity, quantity, dealing with long-lived actinides and waste that would, certainly would not obviate the need for some sort of geologic disposal, but would dramatically change the type of geological disposal you would need to have. And I'm sure there's lots of discussion about this. I'm wondering if you could give us some reflection of that.

GENERAL SCOWCROFT: Well, I can but not very much because the focus of our Commission was on nuclear waste disposal, not on technology, but we thought that that was important because there were lots of questions, you know, some people said, "Well, let's just say once through is the way it ought to be forever," and so we did pay attention to that and I, but I think it was in a general statement. And what we said is, you know, "Look at the technology and possibility." We saw possibilities that would greatly modify and improve the problem of waste management. But we didn't come to any specific conclusion, either on them or on reprocessing. But I don't know; any of you want to comment on that?

TIMOTHY FRAZIER: Tim Frazier, I was the DFO, now senior advisor at Dickstein Shapiro. The biggest thing to take away from that, Commissioner Magwood, is that regardless of what we do in the future, there's going to be some percentage of the waste that's going to require deep geological disposal. So that's, if I can speak for the Commission now, that's where you know, we were headed at that point was just the acknowledgement that you know, even if GNEP had gone to fruition, there was still going to be a percentage of waste that was going to require deep geological disposal. Because the decontamination factors you know, to get the actinides out, you're never going to get it all, you're going to have some left, you start processing lots of material, you're going to have lots of material to dispose of.

COMMISSIONER MAGWOOD: So in that case, is it the best way to read the Commission's conclusions, not that the advanced, that these advanced technologies wouldn't have an impact, because it does seem to indicate that, it's really that it wasn't something that was looked at as particularly in the nearer term, looked at as something that was particularly relevant to the Commission's charter. Is that a better way to look at as opposed to a judgment about those technologies?

GENERAL SCOWCROFT: I think that's about right. We didn't come to conclusions; we just said that from our review, we encourage the continuation of R&D in these areas.

COMMISSIONER MAGWOOD: Okay, that's very helpful, thank you. Another area, and this is -- many aspects of the report I think will be the subject of interesting debates in the future in the halls of Congress, I suspect. But one area I was hoping to get some of your thoughts, there's this issue of

having a consent-based process, which would require some sort of consent locally. What does, how does one achieve consent?

GENERAL SCOWCROFT: That is an especially good question, and that is one of the problems, and it's a special problem in the United States with our federal system because there are different levels of consent from the very local community up through counties, up to states, and so on, so it is a very difficult issue. And we didn't try to define it too narrowly.

We've found in our examinations around the countries, and I didn't explain it, but we had hearings in many, many places around the country. And frequently you would find a difference of view from the citizens at the particular area and the citizens in the state but divorced from the area. And so that's a problem that I think you need an adaptive approach. You need to give enough that attract broader elements of the society that you need to find it attractive, like for example, setting up research parks in the area, the kinds of things that people who aren't in the local area and interested in the deposit itself still say, “Yes, this would be useful for my state to have.”

COMMISSIONER MAGWOOD: So one could imagine, certainly, a process of incentives provided to a local community or state to sort of balance what deficits they saw in hosting the consolidated storage facility or permanent disposal facility with research facilities, industrial development, so basically it's a -

GENERAL SCOWCROFT: Those are the kinds of things, yes, that we would that the back and forth would uncover as being sufficiently appealing -- and I say this at some length because, you know, Sweden and Finland have dealt with this problem and solved it. They have a less complicated political jurisdiction situation to deal with, and so it's a little simpler than here.

COMMISSIONER MAGWOOD: Sort of an ancillary question to that. It seems to me that because I think one of the really important recommendations you make is the idea that there should be a single-purpose organization developed to take over the back end of the fuel cycle; I think that's a very important idea coming out of this discussion. But I wasn't really clear on how, if one expects to gain local consensus through the use of these sorts of incentives, you know research parks, whatever else, that's something that's typically the federal government can provide in terms of incentives. It's not usually the sort of thing a government corporation or other type of organization could provide, so how do you see that handshaking taking place? Was that talked about during the discussions?

GENERAL SCOWCROFT: I don't think we talked about it in any great detail, but I can get back to you on that unless somebody else.

THOMAS COTTON: I'll make an observation that there was some expectation that probably at the end of the line on a negotiation process, there would be legislation at some point, to approve whatever agreements had been reached and to lock commitments into law, and that that would be -- that was the process that was envisioned with the nuclear waste negotiator. And that that would be a stage at which any commitments for things that go beyond the capabilities of the agency, that's where that could be provided. For example, they might want as part of an agreement, some transfers of federal land. Well no, you can't delegate that deal. We couldn't do that; that has to go and get approval. So it would be expected that if there are things that go beyond the agency's capability, it could be dealt with when the agreement is finalized.

COMMISSIONER MAGWOOD: Thank you, my time is essentially

up, I will ask hopefully something you can answer relatively quickly, probably can't, but I'll ask anyway. And that is -- the consolidated storage facilities are an important recommendation in this as well, what kind of discussion did the Commission have regarding difficulty or the challenges in getting local consensus to site such a facility in the absence of an established permanent disposal facility, so just curious as to what kind of conversations you had about that.

GENERAL SCOWCROFT: Well, we found that there was a lot of apprehension around the country to being considered for a storage facility because you might end up being a disposal site because a lot of the fuel is stranded now, and so that is a particular psychological consideration that we dealt with. And there would have to be a relationship there that would reassure that those willing to accept a storage site would not turn into a permanent disposal site.

MATTHEW MILAZZO: Well, and I was going to say, there were two really additional pieces to that that give localities the confidence that that wouldn't be a long-term solution. One of those was we the Commission had imagined that that would be part of the -- clearly the pre-negotiations and everything else, you know, how do we set time frames for the removal, but the other one was that there was a credible, that's why they recommended, the Commission recommended both geologic disposal and storage facilities. Those programs had to be in parallel, that there was a credible program that allowed people to believe that would happen and the recommendation that the financing be fixed to allow access to these programs simultaneously, the spending to be high enough to do both of these at the same time. That also would give people the belief that the government was serious about making both of these happen

and would kind of eliminate that de facto repository problem.

COMMISSIONER MAGWOOD: Okay. Well, thank you very much, and thank all of you for your contributions. Thank you, Mr. Chairman.

CHAIRMAN JACZKO: Commissioner Ostendorff.

COMMISSIONER OSTENDORFF: Thank you, Mr. Chairman. I want to add to my colleagues a thanks to the Commission and all the staff and team that brought this report to fruition. I had a chance to be on a panel early in March with Dr. Carnesale to discuss the BRC report, and we had a very engaging four and a half hour panel out in Phoenix on this topic, and I really enjoyed that. But, I came away with a lot of respect for the product that you all worked together so hard to put out, and we're very grateful.

I want to comment on a couple of your things on the -- and your statement, General Scowcroft, that really resonated with me, one was the unanimous approval, I think, is very helpful for us to see where is there broad consensus of national experts and leaders, and I thought that was extraordinarily helpful to identify that in your opening remarks. I also, in your closing, resonate with the -- I guess a little, very polite statement of frustration from your statement about we even know how to do it, and the status quo was not acceptable, so I think probably most of us agree with you in that area.

But, I think y'all have done the nation a great service. I think the other piece I comment on, you didn't try to prescribe solutions for every single issue, which I think would have hurt the credibility for trying to do a force fit and making a square peg, round hole approach toward some of these things that really don't lend themselves to straightforward solutions, but you at least identify the architecture of what has to be sorted out, so I think that's been very helpful.

GENERAL SCOWCROFT: Thank you.

COMMISSIONER OSTENDORFF: Not surprisingly, I think my colleagues, Commissioners Svinicki and Magwood, have already raised a couple of questions that are in key areas. I want to go back to some of the areas they've raised, because I think it really strikes to me as to where these are critical pieces, and I'm going to go back to Commissioner Magwood's line of questioning a little bit on consent-based. I think your first recommendation is perhaps -- if one looks at the lessons learned for where we are today, that perhaps has been the most poignant lesson learned for the country.

And this panel I was at with your colleague in Phoenix, I asked a question of the audience in response to a question I was asked, which is, "Okay, let's talk about consent." And Commissioner Magwood was touching on this, and I'm going to kind of raise a scenario and then ask how does this get decided. Let's take the local county wants to have a geologic repository cited in its county boundaries, and let's say that the local community, the city and county all agree. I'll say the governor agrees, but the state attorney general has legal concerns and doesn't want to commit to no litigation in this area, and you get into having some legal finality of a -- at some point in the process -- and I realize, you know, Commissioner Svinicki was talking about adaptive, and you mentioned the template, and it's kind of a phased approach. But, at some point in time from predictability, stability, finality standpoint, it has to be final. You can't say, "Well, let's regroup and decide next week what we're going to do." It has to come to some closure.

So, I was curious, did the Commission discuss what role the congress might have in an amendment to the NWPA to establish some hierarchy

or architecture to get to a definition of consent?

GENERAL SCOWCROFT: No, I don't think we did, and we left it broad. In our experience in travelling around, we found places consent worked very well and places it didn't. Nevada is a place it did not work well. New Mexico is a place it worked very well, and we examined how -- what the differences were, and it's pretty hard to ascribe what difference is responsible for the different results. But, I think that the Nevada experience was the sense that it was being crammed down the throats of Nevadans, and in New Mexico, with the waste isolation pilot project, it was built really from the community up with state acquiescence and in the transportation -- there were problems with transporting the fuel through the large cities there, and there was an agreement to built a highway bypass and so on.

So, we were encouraged by that that if one approaches the problem and say we want a solution that makes -- that improves the situation for everybody, that it can be done because it was done in New Mexico. And, frankly, down there, they're enthusiastic about developing further in this process.

So, no. We didn't involve the Congress or anything. We think it needs to be probably sort of site-specific in terms of how you negotiate the issue.

COMMISSIONER OSTENDORFF: But, at some point in time, would you envision that at a certain stage of this process there being some federal legislation, because the current Nuclear Waste Policy Act clearly has a different scheme in mind?

GENERAL SCOWCROFT: There will have to be legislation or legal documents, yes. Yes.

COMMISSIONER OSTENDORFF: And that would, at some point

in time, not saying year five, six, or 10, but that would lay down and provide this legal finality so there is a certainty as to the status of a project based on --

THOMAS COTTON: In the definition of consent, they observe that a good measure, it may not be absolutely necessary, but a very good measure would be that you have a mutually binding legal agreement at the end of the day, and that the opt out stage would end by the time that you get to a license application, that everybody would pretty much have to be on board at that stage, too, that the project would go forward, assuming it passed and it met all the licensing requirements. And then, as you said, there's, I think, an expectation that at the -- also at the end of the day, you would have some sort of legislation to lock in those parts of the agreement that couldn't be made just by the organization itself.

COMMISSIONER OSTENDORFF: Okay. Thank you. Let me shift to maybe perhaps a related question as, that deals with the Congress a bit here, but I think, you know, in your testimony, you very carefully and articulately laid out those things that the NRC should be doing, looking at doing, et cetera, and while those do not require any change to legislation, some of them do. And, obviously, as commissioners in this agency, we have a responsibility to be good stewards of taxpayer dollars, not to get too far out ahead of the Department of Energy or any congressional implementation of amendments to the NWPA. And I guess that, maybe one question, I may follow it up with a second one, but do you have any thoughts that you care to share as to the process that you think Congress might employ to ensure the greatest chance of success of getting through whatever legislative amendments or changes might be appropriate to implement your recommendations?

GENERAL SCOWCROFT: Well, the one thing that is certainly required is the funding has to be straightened out. Right now, the utilities pay into the waste fund, and it's treated as simple income to the Treasury, and it is not available for the use, for the waste facility use. That has to be fixed, and that's one of the recommendations that we think has to have a high priority, and the Congress will be required to do that.

COMMISSIONER OSTENDORFF: Do you see that there is a value or any impetus -- and I realize that's not part of the Commission's charter, but do you see that there's going to be some kind of a bipartisan House, Senate type committee or caucus to shepherd these amendments or changes through the Congress to get this --

GENERAL SCOWCROFT: We did not presume to assist the Congress in that. We have testified both in the House and in the Senate, but that's as far as we've gone.

COMMISSIONER OSTENDORFF: With respect to -- I appreciate that answer -- with respect to the federally chartered corporation, new structure as opposed to the existing Department of Energy, which -- from your study of that structure and how the DOE has interacted in this area over several decades, would you see that a new entity having any significant impact on the Nuclear Regulatory Commission as to how we do business in this area, or should it be somewhat transparent?

GENERAL SCOWCROFT: I don't -- we didn't really focus on that relationship, but I would not think that it would change fundamentally the way you do business. It would -- it's designed to be a single purpose organization, so that the broader Department of Energy, you know, gets sidelined and neglects things

and so on, and it's also a certain assurance from political interference, partisan political interference, that any executive branch or department has to -- and that was the goal, you know, sort of a Tennessee Valley Authority kind of thing, which I don't think we focused on what your relationship would be, but I would think it would be easier than with the department.

COMMISSIONER OSTENDORFF: Okay. Thank you, General. Thank you all for your service. Mr. Chairman.

CHAIRMAN JACZKO: Well, maybe following up a little bit on that question, and as the funding, a new funding mechanism is established, I could see some different ways for the NRC to be funded. One area that I think would, of course, cause me some trepidation is if we were, if there was a new federally funded organization that had the responsibility for the development of the facility, and that was where all the funds were going, for us to then be funded out of that entity would probably cause some concerns about independence. So, I don't know if you got into that level of detail on the mechanism, or --

GENERAL SCOWCROFT: We didn't get into that level, but that obviously is a concern, and I don't know if my colleagues know -- the uses of that money were pretty carefully laid out, but I don't know if they dealt with that issue.

THOMAS COTTON: I think we did not, it was not specifically discussed, but I would imagine that the solution, even if there's a change in organization, would be the same one that was reached the first time, which is that NRC, the regulator would continue to be funded from the waste fund and separately from the implementing organization.

CHAIRMAN JACZKO: So, through the Congress.

THOMAS COTTON: Through the Congress

GENERAL SCOWCROFT: I would say so.

THOMAS COTTON: -- that's my expectation.

CHAIRMAN JACZKO: Thank you. That is very helpful, and I appreciate that. One of the issues that seems to underline a lot of the effort, in particular, for the NRC, is to move forward in a number of activities. The Commission talked a lot about the efforts in transpiration and what we're doing in reference, I think the NAS is going, or the next step, or whatever their report was, and part of that was efforts on our package performance study. And I don't know if you had thoughts about kind of the timing and when some of those things would happen, and it seems that a key piece of that is developing a standardized canister or a standardized disposal container so that we can begin moving forward on some of those things. I don't know if you have thoughts on that and where you see that in the hierarchy of things that would need to be determined or developed.

GENERAL SCOWCROFT: Transportation is, we discovered in our hearings, is a very sensitive part of this whole thing, because parts of the country that aren't involved in either the power plants or disposal still worry about nuclear materials going through their states. So, we elevated it to an importance there. Actually, we have a very -- there is a very good safety record, and it's worked very well, but I think we need to be visibly paying attention to this and visibly bringing in local law enforcement and so on to manage the process, and I would think the containerization would be a demonstrative part which could show that it's being taken seriously, and relieve the general public who otherwise wouldn't be involved from saying, "No, we don't want this."

CHAIRMAN JACZKO: Okay. Thanks. The -- sorry. Did you have

something?

MATTHEW MILAZZO: Yeah, Commissioner, we were just going to say that, you know, the Commission had recommended that particular item that you had mentioned. That was a Department of Energy responsibility, and that we did hope that they move forward. Of course, we can only hand over the report, and, at this point, they're, as you know, have established a series of, you know, internal organizations to move forward with those recommendations, so we hope that when they deliver their report to Congress in the summer, at some point in the summertime, that we'll have a better idea of how they plan on moving ahead with that particular topic.

CHAIRMAN JACZKO: Well, and I appreciate that, and I think as I look down at some of the -- as we get into a little bit more fine level detail, some of the challenges, I think, that will be important is the timing of identifying a common packaging design, because I think that will facilitate interim storage. The fewer times we have to package and repackage fuel from a safety perspective, the better it will be. And it also allows us, then, to do more testing on the canisters themselves and the so-called package performance study would do some very significant destructive testing to demonstrate the capabilities of these packages. So, I think that is probably one for us to take some thought to as to how we can perhaps help the Department of Energy move forward on that effort to finalize a package design, and get that resolved.

One of the things I found interesting, and I know this was touched on a little bit in some of the hearings that you had, was the issue of different waste streams. In particular, the report seems to focus primarily on commercial spent fuel, but, of course, there is an inventory of defense waste and defense

fuel that is out there, and I wonder if you just maybe could touch a little bit at a high level on, to what extent Commission discussed different waste types, and if the report's conclusions are really applicable to all types of waste or if they were really geared more specifically towards commercial spent fuel?

GENERAL SCOWCROFT: We did not really have time to get into that, but we recommended Department of Energy look at that very quickly and very carefully. We just didn't have time to sort it out, but it is a very complicated issue, both from the standpoint of management, who does it belong to, and secondly the inherent qualities of the waste itself.

CHAIRMAN JACZKO: So, the report, and I'm sorry, did you --

TIMOTHY FRAZIER: Just let me add a couple thoughts. The Commission made the -- not a recommendation. We alluded that the department should relook at whether the civilian and defense waste should be comingled. But broadly, the approach that we recommended, the consent based approach, applies to essentially any waste disposal that you might have to do, regardless of what kind it is. Just to clarify.

CHAIRMAN JACZKO: But there might be differences if it's a government/private entity, they may not be able to take the defense waste or something like that.

TIMOTHY FRAZIER: That's right.

CHAIRMAN JACZKO: Great. Well, thank you. I appreciate that clarification. Of course, for us, our primary responsibility is with the commercial spent fuel, so that is important.

You know, as we look -- and I appreciate the statements of support for the NRC and our programs and the work that we've done as we go forward,

and the work that we've done in the past on all of these areas. I wondered if I could just get some sense from you about when you think we could get started. In particular, there are recommendations about us moving forward on a generic standards for repository. Do you think that's something that needs to wait for DOE, or is that something you think we can begin working on today?

GENERAL SCOWCROFT: I haven't really concentrated on that. I think the sooner we can show motion, the more likely it is that we will get momentum to move forward on this, and the two things that really require early action are, one, the special government corporation, and two, the funding. And if we could get action on those, I think anything that the NRC could do would further get us moving forward on this, because the danger is this is an election year and so on, and we will lose the psychological momentum, however much there is, to get going on this, and it'll be very hard to move forward.

CHAIRMAN JACZKO: Well, I appreciate those thoughts, and I think as we look at your report, an obvious area, I think, for us to begin moving is on those generic regulations, and that's clearly something that will take time to develop.

GENERAL SCOWCROFT: Yes.

CHAIRMAN JACZKO: But, I think if we do, can move forward on that soon, I think it will capture the good work that you've done and keep us moving forward on addressing those issues. So, I appreciate those thoughts. I didn't have any other questions. I don't know if my colleagues had any other questions.

Well, again, I want to thank you for being here and for the work that you've done in this very important area, and thank you for your efforts. I

appreciate your comments about the NRC and the work that we've done in our agency and how you captured our work in the report. I think it was a very positive reflection on the agency, and we thank you for that. We are going to hear a little bit from the NRC staff. You're more than welcome to stay for that, but I, of course, I understand if you need to leave. So, again, I want to thank you for being here, and we'll adjourn for a few minutes, then.

GENERAL SCOWCROFT: Well, thank you very much. We appreciate your listening to us, and as I say, we are very optimistic. I think the nature of this panel, the 15 people have very different perspectives on all this, and the fact that we were able to come to a consensus conclusion leaves me with a lot of hope that if we all work together on this, we can finally break through. Thank you very much, Mr. Chairman and Commissioners.

CHAIRMAN JACZKO: Thank you, General. We are adjourned for five minutes.

[break]

CHAIRMAN JACZKO: We will now hear from the staff on their views, on the Blue Ribbon Commission's report, and their discussion of NRC actions to date to address the issues, and potential actions going forward. So, Mike, we'll turn it over to you.

MICHAEL WEBER: Good morning, Chairman, Commissioners. I am Mike Weber. I am one of NRC's Deputy Executive Directors for Operations and I'm obviously filling in for Bill Borchardt. Bill is at the Fukushima Steering Committee. So, he was unable to attend this morning's meeting. The purpose of the staff's presentation is to discuss the potential implications of the Blue Ribbon Commission's recommendations for NRC's regulatory framework, and for our

regulatory programs.

Now, it's important to point out, as already been mentioned, that the Department of Energy has the lead responsibility within the Administration for developing and implementing a strategy to ensure safe, secure management of spent nuclear fuel and other nuclear wastes.

As directed by the Congress, in the fiscal year of 2012 appropriations, the Department is preparing a strategy to respond to the Blue Ribbon Commission's recommendations, and we understand that that should be out later this year. The actual implications of the Commission's report will depend on how national policy has changed by the Administration and by the Congress, and then how it is implemented and funded. Now, as the NRC is the regulator of the civilian nuclear safety and security, most of the elements of the strategy and the recommendations put forward by the Blue Ribbon Commission relate to NRC's ongoing regulatory activities.

As you will hear from staff today, from the Office of Nuclear Material Safety and Safeguards, we intend to monitor the development of the national policy and adjust our regulatory program, as directed by the Commission. Our primary objective is to ensure the safety and the security of the spent nuclear fuel that already exists, and will continue to be generated. Our secondary objective is to be prepared to move forward as the nation needs us to, in executing our regulatory functions.

Alicia Mullins will summarize the implications for the NRC programs pertaining to cross-cutting topics from the Blue Ribbon Commission report, and those topics include stakeholder engagement, a new waste management organization, funding, innovation, technology, and leadership.

Dr. Brit Hill will describe the implications of the Blue Ribbon Commission's recommendations, with respect to geologic disposal storage and the nuclear fuel cycle, and then Earl Easton will focus on the implications of the Blue Ribbon Commission recommendations for transportation safety and security, and then when Earl is finished, they'll hand it back to me, and I'll wrap up with some brief remarks on how we're using the lessons learned from the Fukushima Daiichi nuclear emergency to ensure the safety and security of spent fuel management.

So, with that, let me turn it over to Alicia.

ALICIA MULLINS: Thank you, Mike. Good morning Chairman, Commissioners. The focus of today's presentation is on key messages and discussions of NRC's program for disposal, storage, fuel cycle, and finally, transportation. It's organized to address the elements of BRC strategy that have potential impact on NRC's regulatory program, and includes an evaluation of key BRC recommendations and observations. Slide 4, please.

Before I begin, I want to convey that our presentations reflect our near term capability to respond to national policy changes that may arise from implementation of the BRC's recommendations. There are two key messages I want to share with you today. First, NRC's staff actively engaged with BRC to ensure it received timely and complete information on NRC's regulations and programs. In addition to making inviting presentations at BRC meetings, we attended most BRC meetings as observers. We reviewed the draft BRC report and provided feedback to clarify NRC's regulations and programs. From the BRC's final report, we can conclude that the BRC was well informed of NRC's regulations, guidance, and ongoing programs.

Secondly, we have long recognized that developing a technical basis for regulatory actions takes time and preparation. For the past several years, the staff has established a number of coordinated programs within the agency to support potential rulemaking activities for the back end of the fuel cycle. Although substantial changes in these programs may be needed to support a new national policy, such changes must await the identification and implementation of that policy. We remain committed to improving our regulatory framework and we believe significant improvements to safety or security are warranted, and can be made. Slide 5, please.

The BRC identified eight elements in their proposed strategies for managing the back end of the nuclear fuel cycle. Throughout the presentation, we will discuss each of these eight elements, but not necessarily in sequential order. The first element focuses on developing a new approach to facility siting, which involve achieving stakeholder consent to siting and development process. From our perspective, the recommended approach would likely call for more stakeholder engagement, especially during the initial phases of facility siting. We have extensive experience with stakeholder outreach as part of our regulatory processes. For example, the Nuclear Waste Policy Act of 1982 envisioned a relatively extensive period of pre-licensing interaction between the NRC and the DOE.

As part of pre-licensing activities, we conducted many public meetings to help stakeholders better understand NRC's regulations and responsibilities, and the geologic deep disposal program. We have also been actively engaged in leading international forums for building stakeholder confidence. Nevertheless, we recognize that many activities associated with

facility siting might occur outside of NRC's authority established in the Nuclear Waste Policy Act. If the Nuclear Waste Policy Act was changed, NRC's role in the siting and pre-licensing process for these recommended facilities may need to be clarified, and as always, we remain committed to seeking ways to better engage stakeholders regarding our regulatory processes.

The BRC emphasizes that the licensing process should be more adaptive to new information, which will likely emerge during the development of centralized storage and disposal facility. We believe that NRC's regulations and other elements of our current regulatory framework support the incorporation of new information during the licensing process, such as organizational changes or technical advances. However, our current regulations provide regulatory decision, a stable, well defined point that have logical links to the safety case, such as construction authorization, license to receive and possess radioactive material, and permanent closure. Although decisions regarding design, construction, and operation can be amended during licensing, we are concerned that leaving such decisions open ended could undermine the transparency of the regulatory decision-making process. Slide 6, please.

The BRC recommends the creation of a new waste management organization, which would focus on the centralized interim storage and disposal of spent fuel and high level waste. Although the BRC expresses a preference for a federally chartered corporation, a range of public-to-private entities are identified by BRC as models for the new organization. NRC has experience in licensing facilities that are owned by a range of public-to-private entities. In all cases, the new waste management organization would likely be a new NRC licensee. Like any new licensee, this new organization would need to

demonstrate readiness to become a nuclear license holder, such as establishing institutional framework that maintain safety and security throughout the proposed facility's operational lifetime. We anticipate that regulatory interactions with the new organization would be consistent with our experiences for our other licensees.

Similarly, the BRC recommendation in element three focuses on facilitating access to the nuclear waste fund, which was established by the Nuclear Waste Policy Act of 1982. Any implications for NRC would depend on potential revisions to the Nuclear Waste Policy Act or change of the national policy, and again, we do not speculate on such a law or policy revision in our analysis. Slide 7, please.

Element seven of the BRC strategy calls for support for continued U.S. innovation in developing both nuclear technology and workforce needed to support all aspects of the nuclear industry. Specifically, the BRC calls for expanded federal joint labor management and university-based support for advanced science, technology, engineering, and mathematic training, to develop the skilled workforce needed to support an effective waste management program, as well as a viable domestic nuclear industry.

To assist in workforce development, the NRC has a longstanding program for nuclear education grants, which fund institutions of higher learning, education to support courses, studies, training, curricula, and disciplines pertaining to nuclear safety, security, or environmental protection and other relevant fields. Innovations in nuclear fuel cycle technology might broaden the scope of NRC outreach and staff development efforts.

As noted earlier in these slides, our role in developing nuclear

technologies to maintain regulatory and technical capability. One way to maintain our capabilities involve engagement with international counterparts. For example, we continue to work with international counterparts on operational experiences with the reprocessing facilities so that we can better focus our rulemaking activities of risk significant processes. Although NRC is not a technology developer, we must remain engaged in understanding the strengths and limitations of emerging technologies so that our regulatory processes remain efficient, transparent, and protected. Slide 8, please.

Under element eight, the BRC notes that if more nations pursue nuclear power, U.S. leadership is urgently needed on issues of safety, nonproliferation, and security counterterrorism. The BRC indicates that institutional controls will likely be more effective in addressing these concerns and technological innovations.

Additionally, the BRC suggests that the U.S. should launch a concerted international safety initiative, to assure safe use of nuclear energy and the safe management of nuclear waste in all countries that pursue nuclear technology. Along with other branches of the U.S. Government, the NRC has a well established strategy for engagement and leadership with international and nuclear community. As new national policies continue to evolve, we anticipate additional opportunities may arise to enhance our international engagement, especially with countries that have expressed an interest in developing nuclear programs. Although we recognize that changes in the U.S. Government's international programs and policies may occur, we do not believe that the BRC's recommendations in this area signal a fundamental change to NRC's current international approach.

The NRC has a long history of effective engagement and leadership with organizations such as the International Atomic Energy Agency. In addition, the NRC represents an important component of the U.S. Government's representation in international safety programs, such as the Joint Convention on the Safety of Spent Fuel and Radioactive Waste Management, the Convention on Nuclear Safety, and the Convention on Physical Protection of Nuclear Material.

We, in the NRC, will continue to look for opportunities for effective leadership roles in international programs that enhance the safe and secure utilization of nuclear energy systems, and the safe management of nuclear waste. I would now like to turn the presentation over to Dr. Brittain Hill, who will describe implications for NRC's programs for disposal, storage, and fuel cycle technologies.

BRITTAIN HILL: Thank you, Alicia. Slide 9. Thank you. I'd like to shift our attention to some specific recommendations and observations made by the BRC that have direct implication for NRC's regulatory activities. The NRC appears well positioned to consider action on these recommendations that are consistent with our current statutory authority, and have the potential to enhance safety, security, or environmental protection. Slide 10, please.

An overarching conclusion by the BRC in element four is that there's no escaping the need to develop at least one permanent disposal facility for materials that are considered high level waste, which may include spent nuclear fuel. The BRC concludes that geologic disposal remains the only practicable approach for creating the capacity needed for this waste disposal. The BRC notes that congressionally mandated revisions to the NRC and EPA's

disposal regulations in the middle of the Yucca Mountain site characterization program had a negative perception by many stakeholders.

The BRC also was aware that the Commission had deferred revising our Part 60 generic regulations for geologic disposal when the specific regulations for Yucca Mountain and Part 63 were developed in the late 1990's. Although the Commission recognized that Part 60 warranted revision, there was no need to undertake rulemaking at that time, because Yucca Mountain was the only site being considered for a geologic repository.

Consistent with its recommendations to revise and resort the site characterization process, the BRC recommends that NRC and EPA develop new generic regulations and standards for geologic disposal, which should be promulgated before the detailed site characterization process begins. The BRC believes that having established regulatory requirements is an important component in building consensus with stakeholders and will avoid the misperception that requirements are being tailored to favor a specific site.

For the past several years, the NRC staff has been working on enhancing the technical information that could support potential revisions to our geologic disposal regulation. This work includes development of computer models to provide risk insights for a broad range of disposal scenarios, a review and analysis of international disposal programs, and initial scoping of technical and regulatory gaps for rulemaking.

In addition, we continue to develop important technical insights on risk significant disposal processes with our colleagues at the Center for Nuclear Waste Regulatory Analysis. From our perspective, developing revisions to our Part 60 generic rule for geologic disposal appears to be a significant rulemaking

effort. Our understanding of technical issues has evolved considerably since the technical requirements in Part 60 were finalized in 1983. A broad range of information from Yucca Mountain and international repository programs is available to help inform a risk informed performance based regulation that is appropriately protective at any potential site.

In element four, the BRC also expresses a number of preferences for new regulatory requirements, including the time of compliance, methods for demonstrating compliance, and approaches for staging licensing decisions. These thoughtful insights will help us evaluate the range of technical information needed in our regulatory basis. We also expect that a full range of views will be expressed and considered as part of the extensive public participation process that occurs in all of our rulemaking activities. Slide 11, please.

As part of the overall approach in element four for geologic disposal, the BRC concludes that deep boreholes are potentially promising disposal technology that warrants further research, development, and demonstration. The BRC believes that having stable regulatory requirements will assist in developing practicable borehole disposal approaches. The BRC also recognizes that deep borehole disposal ensures many of the same safety attributes as a deep geologic repository. However, there are important differences that would need to be addressed, such as the ability for waste retrieval after emplacement. The BRC recommends that NCR and EPA develop a new regulatory framework for deep borehole disposal, which is consistent with revised regulations for geologic repositories.

Recently, the NRC staff began investigations to better understand the technical considerations involved with deep borehole disposal. This work

could serve as a foundation for evaluating the key regulatory and technical gaps that would be needed for a resolution to support rulemaking. Nevertheless, unlike deep geologic repositories, deep borehole disposal was not envisioned in the Nuclear Waste Policy Act of 1982. Likely revisions to this statute have the potential to effect important regulatory issues associated with borehole disposal. In addition, some interpretations of the statute might rate policy issues that would need Commission intervention, such as the applicability of retrievability requirements for spent fuel versus high level waste.

From our perspective, potential revisions to the Nuclear Waste Policy Act appear to represent a more significant challenge to advancing rulemaking for deep borehole disposal than to developing a revised generic regulation for geologic repositories. The BRC also recommends, in element four, that both NRC and EPA maintain their current statutory rules in implementing regulations and developing standards for geologic disposal. NRC and EPA should look for opportunities to enhance coordination of their regulatory framework activities, so that the pathway between establishing and implementing standards is as transparent and consistent as possible to stakeholders.

From our perspective, we believe that successful interactions with EPA's staff regarding the implementation of a one million year dose standard for Yucca Mountain reflects the potential for appropriate regulatory coordination with EPA. We remain committed to enhancing the transparency of our regulatory processes for all stakeholders. We continue to look for ways to improve interagency coordination and clarity in the development of future regulations, and for additional ways to enhance our stakeholder interactions during the development of regulations. Slide 12, please.

A key recommendation in element five calls for the prompt development of one or more centralized interim storage facilities. Such facilities would be built using monies from the nuclear waste fund, which was established by the Nuclear Waste Policy Act. From the BRC's perspective, these interim storage facilities would have many benefits, including the ability to consolidate spent fuel storage from decommissioned sites, and to facilitate technical investigations on long term storage issues. The NRC has the appropriate regulatory framework to support licensing of potential centralized interim storage facilities operated by either a government or commercial organization. Our Part 72 regulations for storage, however, incorporates some sighting restrictions that were developed in the Nuclear Waste Policy Act. The Nuclear Waste Policy Act linked development of a monitored retrievable storage facility to the development of a geological repository.

Consequently, the BRC recognizes that a centralized storage facility could not be located in a state that had a site approved for characterization of a geologic repository. Also, construction of the storage facility could not begin until NRC had issued a license for the geologic repository. If these statutory restrictions on siting and monitored retrievable storage facility are removed, NRC would need to revise our Part 72 storage regulations before we could issue a license for such a storage facility.

If this potential storage facility is developed, BRC recommends reconsidering the planned approach for shipping spent fuel away from onsite storage at reactors. BRC believes that spent fuel from ten shut down reactor sites should have the highest priority for shipment to a new centralized interim storage facility. From our perspective, NRC's existing regulatory processes are

able to accommodate spent fuel shipments from these shut down reactor sites. Inspection activities would, of course, be needed before spent fuel could be transported from these sites, and in addition, completion of site decommissioning would likely occur at these shut down sites, following the removal of the spent fuel.

The BRC also recommends reconsidering the standard contract approach for giving highest priority to the shipment of oldest spent fuel. BRC believes that allowing the shipment of younger, hotter spent fuel will give reactor operators additional flexibility in managing wet and dry storage options for spent fuel. From our perspective, any shipping campaign will be conducted under NRC's existing regulatory framework. Although these changes in shipping priority might affect workload planning, we believe that NRC's existing regulatory framework can accommodate these activities. Slide 13, please.

BRC expresses confidence that spent fuel and high level waste are being stored safely and securely at licensed sites. But that active research and continued responsiveness to new information is needed to maintain this confidence in the decades to come. Several years ago, we recognized the need to consider longer timeframes and alternative spent fuel management strategies in NRC's regulatory processes. The staff began planning and implementing a series of focused investigations to better understand the regulatory challenges associated with these considerations. We made several invited presentations to the BRC on aspects of this work, which helped inform BRC's specific recommendations for enhancing confidence in the long term safety and security of spent fuel storage.

Many of the BRC recommendations for long term storage parallel

ongoing activities in the NRC's extended storage and transportation program. Most prominently, we are coordinating with industry and other government agencies to develop appropriate technical basis to support licensing actions for long term storage of spent fuel. In addition, our colleagues at the Center for Nuclear Waste Regulatory Analysis are helping use their expertise to develop independent technical insights on risk significant storage topics.

As discussed in staff's 2010 project plan for the regulatory program review to support extended storage and transportation of spent nuclear fuel, which is in COMSECY-10-0007. We can use this body of information to help us develop appropriate guidance and potentially revise regulations, to assure that the long term storage of spent fuel does not create unacceptable safety or security risks. This 2010 project plan also identifies four potential policy issues regarding the need for cask certification through rulemaking, integrating storage and transport cask design standards, maintaining long term cladding integrity, and long term financial assurance requirements. From our perspective, changes to the national policy for spent fuel storage have the potential to affect NRC considerations in these areas. As part of our extended storage and transportation program, we're developing additional technical information to help inform the Commission on these four issues.

As Part of the 2010 update to NRC's waste confidence decision and rule, the Commission directed the staff to evaluate potential environmental impacts of spent fuel storage for more than 120 years. We recently issued a draft report on background information and important assumptions we're considering in approaching this long term environmental assessment. We're currently incorporating public comments we've received on the draft report and

plan to issue a final report later this year. As needed, information from our extended storage and transportation program also can be used to help us better assess potential environmental impacts.

The BRC also acknowledges, as does the NRC staff, that understanding the potential impacts of long term storage is not justification for delaying work in developing safe and secure disposal options. Slide 14, please.

From our perspective, BRC has two important observations on fuel cycle technologies that have direct implications for NRC. The first of these is BRC's observation that the current fuel cycle approach is expected to continue for the next 30 to 40 years. While recognizing that innovation in nuclear processes will undoubtedly occur, BRC expects that technology developments in the next three to four decades are unlikely to change the underlying need for safe storage of spent fuel or the development of disposal facilities, or facility.

In the area of spent fuel reprocessing, the BRC outlines the complex technical, economic, and strategic considerations that influence decisions to reprocess or directly dispose of spent fuel. While not advocating specifically for reprocessing, BRC includes reprocessing in the mix of technologies that warrant consideration in research and development programs. BRC recommends that a range of open to closed fuel cycle options should continue to be evaluated. From our perspective, this BRC recommendation indicates that NRC should continue to evaluate its regulatory framework to ensure that commercial reprocessing of spent fuel can be done safely and securely, if such reprocessing does occur.

In SECY-11-0163, we recently informed the Commission on our progress towards developing a regulatory basis to support reprocessing specific

rulemaking. The accompanying draft regulatory basis report also identifies several technical issues that have potential policy implications, which might be affected by implementation of the BRC recommendations. These potential policy issues include the basis for defining high level waste from reprocessing. Applicability of NRC's waste confidence decision to the storage of high level waste and implementation of etiolate release limits. As part of our regulatory basis development, we're evaluating additional information to help inform the Commission on these issues.

BRC expressed support for NRC's current risk informed performance based approach for developing regulations for advanced nuclear energy systems. To maintain this approach, BRC recommends that NRC receives additional support for our ongoing work to develop regulatory frameworks for novel components in advanced nuclear energy systems. BRC concludes that the DOE's nuclear energy R&D roadmap provides a good framework for advancing nuclear energy technology. As these new technologies evolve, NRC will need to remain engaged with DOE and others, so that our regulatory processes remain protective, technically defensible, and efficient. Slide 15, please.

BRC also makes a separate observation about the waste classification system in the United States from the perspective that the system ideally should be more risk informed. BRC acknowledges that our current approach to waste classification appears to provide adequate public protection, in spite of its perceived shortcomings and complexities. Nevertheless, BRC concludes that development of alternative fuel cycle technologies may create additional challenges to this long standing waste classification approach.

Consequently, BRC supports NRC's ongoing efforts to review and potentially revise the waste classification system in 10 CFR Part 61. BRC recognizes, however, that a comprehensive revision of the waste classification system would require changes to existing statutes.

I'd like to turn the presentation over now to Mr. Earl Easton, who will discuss NRC's programs for transportation.

EARL EASTON: Thank you. Thank you, again. We're now turning to element six, where we're going to focus on the BRC's recommendation to prepare for large scale shipping campaigns, for spent fuel. The BRC recommended that prompt efforts be undertaken to prepare for large scale shipping campaigns, to either interim storage or geologic repository. The planning for large scale shipping campaigns typically involves coordination with emergency response, regulatory and law enforcement agencies from individual states, shippers, carriers, and other federal regulatory agencies, such as the Federal Rail Administration.

Historically, states have requested multi-year lead times for planning campaigns, to allow participation in route selection, training of emergency response personnel, and a development of rail and highway inspection protocols. I believe the Midwest group actually proposed a 10 year lead time when they testified before the BRC. An successful shipping campaign has been to the waste isolation pilot plant, where shipping plans actually began over a decade ago, or even a decade before the shipments were made to WIPP.

So far, there have been 10,000 successful shipments made under this planning. This is about the order of magnitude that would support 70,000 metric tons of spent fuel, the number of shipments. Also, the states have been

involved to a lesser extent in the planning for possible shipments to the Private Fuel facility.

To date, the NRC's primary role in these transportation planning activities has focused on package certification and security arrangements for NRC licensed shipments. We do not expect any significant changes to our regulatory programs from the BRC's recommendation to begin planning efforts to support potential large shipping campaigns. For many years now, the NRC has actively participated in state regional groups that have been set up by DOE that focus on transportation planning. Among these groups we regularly interact with are the Council of State Governments, the Northeast office and the Midwest office, the Southern States Energy Board and the Western Governors' Association.

Through these regional groups, we have routine access to 45 different states, the transportation planners in 45 different states. You may ask which states have not been involved: Montana, South Dakota, North Dakota, Alaska, and Hawaii, because they don't have routes that would really be involved.

We have used these regional groups to discuss many issues, many NRC issues that involve transportation planning. For example, when the Commission asked the staff to proactively deal with the states on their transportation security rule for spent fuel shipments, we used these state groups to actually hold workshops on the rule's contents and the contents of the guidance, and we asked each of the state groups to participate in sending comments, pro or con, but to go on the record. We've also used these groups to explain our severe transportation accident studies, in an attempt to explain the

robustness of our shipping package that we certify. Although we consider these relationships important and productive, the nature and scope of future large scale shipping campaigns may require the NRC to conduct more extensive public outreach, and broaden their audience beyond these established stakeholders.

In response to a question from Commissioner Ostendorff, how would a new entity change the way we do business. Well, the big campaign that was -- we were planning for, these state regional groups were planning for was Yucca Mountain, and that involved DOE as the shipper. So, DOE self regulated a lot of the shipper. If we have another entity that makes the shipment, now it's the NRC licensees that become the shipper, and we may have a different role. We may have a more expansive role. The BRC also recommended that we complete the implementations of recommendations from the National Academy of Sciences report in 2006, entitled, "Going the Distance." I'm on Slide 18, now.

That report specifically addressed the safety and planning for large scale shipping campaigns. It focused, of course at the time, on Yucca Mountain. There are three recommendations in that report that most directly involve the NRC and they were for additional studies on long duration, fully engulfing fires, and independent security assessment for large scale shipping campaigns prior to their commencement, and the continued use of full scale testing to demonstrate the safety of cask. We reported on these three recommendations to the Commission in 2007, what our plans were.

In brief, I'm trying to keep my eye on time, but in brief, in response to the Academy of Science, we have completed a number of studies on severe fire in accidents. We have published a series of NUREGs and submitted them all for public comment. These consider both highway and rural accidents involving

severe fires. We expect to wrap this up in FY 2013, and maybe combine all our case studies in one big NUREG, and put that out for public comment.

In addition, we did request the Association of American Railroads to adopt some administrative controls on how rail shipments are made for spent fuel. Going to the second point, the NRC did not endorse the National Academy's recommendation for independent security assessment, prior to the commencement of long term, large scale campaigns to Yucca Mountain. That was because DOE planned to take title to the fuel and they would be the actual shipper, rather than the NRC. It would also have been difficult, at the time, to do an independent assessment, since the precise routes had not been announced and the threats along those routes were not really quantified, and the shipping timeframes were not known. Instead, we addressed transportation security by doing a rulemaking in how to find all the lessons learned from 9/11, going out and getting comments from the states, et cetera, et cetera, and that's the one that I think has just been approved.

The National Academy of Science also endorsed the use of full scale demonstration tests for shipping casks. The NAS also was clear that they did not think that full scale testing was needed for certification purposes. There's a difference between a certification test, 30 foot drop onto an unyielding surface, and a demonstration test where you simulate an accident. The PPS was the simulation of an accident. At the time, the NAS study was in progress, we had already planned to do the PPS study as an outgrowth of a prior risk study we did in 2000, NUREG-6672. During the package performance study, it was decided that we would also, after we did the demonstration test, stage an emergency response exercise as a way of keeping states involved.

We tied the PPS to a design we thought that would be used quite often for shipments to Yucca Mountain. Of course, when the Yucca Mountain program went on hold or suspension, we informed the Commission that package performance study, we were not going to follow through with that, because we didn't have the package that we were going to use to test.

NRC will be an appropriate position to evaluate the merits of a package performance study once a clear direction emerges from the BRC, and we will reconsider the merits of package performance study. We have also talked to DOE, who is also looking at the merits of doing a package performance study. I think either agency could possibly do it, or both agencies in combination.

Last point I wanted to make is a key planning assumption in the Yucca Mountain program was the extensive use of a standardized transportation aging and disposal canister, called the TAD. The use of standardized shipping systems is one of the many topics being considered in the reformulation of the nation's waste management policy -- 34 seconds, but I'd like to make one final comment that has always plagued me from being in the storage transportation area for a very long time. Is storage driving disposal or is disposal driving storage? For many years we have let applicants optimize storage casks based on capacity. So they have a less number of casks, have to ship less number, and with the assumption that whatever is being stored will fit into a repository. When the final design for Yucca Mountain, it was based on a much smaller canister, and then the idea was to have people to start store in that canister. So are we standardizing around storage and then designing disposal to meet storage, or are we standardizing around disposal and I hope I haven't confused you. With that, I'll turn it over to Mike.

MICHAEL WEBER: Thanks, Earl. Obviously, our objective is to ensure that storage, transportation, and disposal would be done safely. So, in concluding the staff's presentation, I'd like to briefly mention how the staff is considering the lessons learned from the Fukushima Daiichi nuclear emergency, as it applies to spent fuel storage and spent fuel management. Although the primary focus of the lessons learned reviews that we've conducted to date has been on how to ensure the safety of nuclear power plants, both the Blue Ribbon Commission and the NRC staff recognizes that the lessons that have been learned from Fukushima can be used to ensure, enhance the safety of spent fuel management.

Based on all we've learned, wet and dry storage in the United States remains safe and secure. In fact, the tier 1 orders issued recently by the Commission improved the reliability and availability of spent fuel pool instrumentation, and are providing additional equipment to support pool cooling, if normal systems and components are unavailable. The BRC, the Blue Ribbon Commission, recommended that the Congress provide the funding for the National Academy of Sciences to conduct an independent review of the lessons learned from Fukushima Daiichi, as well as the implications for the safety and security of spent nuclear fuel. The Congress issued similar direction to the Commission in the fiscal year 2012 Energy and Water Appropriations Bill, and so the NRC has already requested, as you heard earlier today, the Academy, to conduct such an analysis.

NRC's ongoing review of the lessons learned from Fukushima Daiichi, the staff identified the transfer of spent nuclear fuel from pools to dry cask storage as a tier three issue. The staff is actively considering this issue

through the spent fuel scoping study, and plans to share the preliminary results of that with the Commission, as well as next steps, in July of 2012. As the Commission is well aware, we've all learned a lot from looking at the emergency at Fukushima Daiichi, and we're committed to translating the lessons that we've learned into whatever enhancements are necessary to continue to ensure safety and security of the American public. This concludes the staff's presentation. We'd be happy to answer questions or respond to comments you may have. Thank you.

CHAIRMAN JACZKO: Well, thanks, Mike. We'll start with Commissioner Svinicki.

COMMISSIONER SVINICKI: Well, I send my thanks to each of you for your presentations and I know that some of you have also worked over the course of time with the Blue Ribbon Commission and its staff, and provided the presentations. Alicia mentioned that you attended some meetings or other meetings, as observers, where you didn't give presentations, and I appreciate that work. I think that as a result, as Chairman Jaczko was noting, the report acknowledges a lot of the work that NRC has going on, and I think it does so very accurately, because of your engagement and your efforts. So, thank you for that.

One area where I don't know that we were able to give testimony to the Commission about our work would be in our international activities area, and it may just be the Blue Ribbon Commission took a lot of testimony, but didn't have time to focus on this. This recommendation is in the Blue Ribbon Commission report, in their chapter on international activities. It says, "The United States should work with the IAEA and other interested nations, to launch a major international effort encompassing international organizations, regulators,

vendors, operators, and technical support organizations, to enable the safe application of nuclear energy systems and the safe management of nuclear waste."

Now, when I read that, I thought we have a lot of international engagement on nuclear safety, both for operations and for waste and sometimes I think that we, in supporting all of that with the extraordinary meetings that have been called as a result of Fukushima, we've been very, very busy, so when I think about launching a major new effort, what would any of you see as the component elements that are missing right now in terms of international coordination on nuclear safety? I know we even have representatives going to international meetings about consent-based processes and things like that, so I think we're very, very deep already into international engagement. Do you see anything missing?

CATHERINE HANEY: I would say I'm glad you picked up on the word missing. I don't see anything missing right now. It's probably more an enhancing some of our international activities. For example, I'm on the Nuclear Energy Agency's Radioactive Waste Management Committee -- on the committee, as well as on the bureau, which is equivalent to a steering committee. We, over the last several years, really have been very focused on looking at geological disposal from an international effort to the point where under the RWMC, NEA issued a collective statement on supporting geological disposal. So in the past there's been a lot of work going there and I do see that work ongoing. I believe we mentioned our work with regards to the Joint Convention under the IAEA.

With that being said, I have several members from my staff, as well

as from the Office of Research that are participating in international efforts with regards to research. We have picked up some additional activities in the research area that we had slowed down in relative to when we focused more on Yucca Mountain, but now with the Yucca Mountain program closing we've started to get more actively involved in that area and it's not just with regards to the geological disposal -- or the disposal, but it also pertains to the technical aspects of extended storage. And, again, several individuals from my office and Research are involved in focusing on the technical areas and what additional work needs to be done, and also identifying areas for sharing information from the United States to the international community, as well as discussions with regards to some of the industry's initiatives with regards to research and sharing that activity primarily through EPRI and some DOE efforts with the Escape Committee that I believe we mentioned earlier. I would offer, Britt, if there is anything that you -- okay.

COMMISSIONER SVINICKI: Thank you for that. You mentioned research. I wasn't certain I was going to ask this because I wondered if it was a little bit off topic. Does anyone know whether or not internationally there are any planned research programs that would take commercial spent nuclear fuel that has been in dry storage for an extended period, which we're getting to have given the maturity of dry storage technologies. We're getting to having an inventory around the world of spent fuel that has been in dry storage for extended periods. Are there any, either multinational or other nations intending to open up any canisters of fuel and then, if so, what would be some of the phenomenology of materials level that we'd be looking for there? Or in looking to add to our technical knowledge? Again, when one thinks about dry storage over time, the

fuel is becoming less thermally challenging. It's decaying, so what would be the phenomenology? And, again, I think that this becomes of concern if you're looking at transport after very extended periods in dry storage.

BRITTAIN HILL: Well, one of the essential parts of the extended storage collaboration program is it is an international effort. It's not just domestic. They do have -- part of the ongoing research in that area is the examination of higher burn out fuels, the more than 45 gigawatt ton per day fuels. Some of the other focused areas that I think you're getting a general consensus that these are the more important areas to look at for extended storage research issues are the corrosion of the stainless steel canister, especially in marine environments. Some things about the mechanical degradation of seals on bolted casks is receiving attention. And also the delayed hydride cracking of the cladding. Those are appearing to emerge as sort of the, if you will, Tier 1 issues that this international group, which includes the NRC, is beginning to focus on.

COMMISSIONER SVINICKI: Okay, thank you. That's helpful and I know those are very long range research activities that we're undertaking. A different topic I had engaged with the first panel, the Commission itself, on their recommendation on beginning to look at a regulatory framework for deep borehole disposal, if NRC decided that that was a priority activity, where would we begin? What would be the first steps? I think that, Britt, you talked a little bit about a gap analysis and looking at literature that's already published. Is there a lot of information published out there?

BRITTAIN HILL: There is some information. Some in the older literature, but also in the more recent activities through the Department of Energy, has begun to reinvigorate research in this area. I think certainly from a

very top-level technical perspective, our understanding of what goes on in the earth, potentially a mile below the surface, has a lot of uncertainties to it compared to our general knowledge for a geologic repository that would be maybe a thousand feet below the surface. Understanding how fluids may move over time in that very deep geologic environment where they would talk about a emplacement for borehole disposal, is probably a very significant technical challenge that all of us would have to have a better understanding of before we could say this is truly a practicable approach or a good concept. There are, of course, retrievability issues that I think we'd have to address as well.

COMMISSIONER SVINICKI: Some of those issues, it sounds like from your description, would be site-specific. Is that true?

BRITTAIN HILL: They could be, but I think when you move away from the individual site characteristics, there are still general concepts at depth that are less site-specific and more horizon-specific. They would extend over much broader areas, so I don't think you'd be at the stage of, like at Yucca Mountain where the exact 20, 50 square miles around it had a lot of individual characteristic, but a geologic environment at a mile deep may have a much broader characteristic that we still have a fair amount of uncertainty over how we'd even characterize.

COMMISSIONER SVINICKI: Okay, thank you. That's very helpful and it sounds like it would be a pretty significant undertaking to move forward on that. I wanted to touch briefly on the issue of transportation. Earl, you did a good job of differentiating between the package performance study or full-scale cask testing as a certification precursor versus -- some have characterized that as having a lot of public confidence value as why you would do -- we don't require

for certification purposes full-scale testing and, again, it's appropriate from an engineering standpoint to rely on scale modeling and computational analysis, which is how our certification process is built.

And you also talked a little bit about the Blue Ribbon Commission overall recommendation, not just for NRC, but for DOE, NRC, and others to prepare for large-scale shipping campaigns and I thought you kind of touched on this, but in a nutshell this is what I heard you say is we don't know the routes, because we don't know the destinations, and we don't have the package design. Seems to me in light of those uncertainties it's hard to prepare for large-scale shipping campaigns. Is that kind of at bottom the challenges that you were trying to convey with that?

EARL EASTON: Oh, sorry. There's a lot of things to prepare for when you're planning shipping campaigns. For example, states have laws that require the inspections of shipping packages. Now, it's hard to stop a train at a state border, but when they did the West Valley shipments, three states got together and they stopped where you change crews, and actually did the state inspections at that time. There's -- every state charges a different fee and now you have people routing around states to avoid the fees. Every state has a different policy on escorting and some want to escort every shipment. Some don't want to escort and, you know, there's route selections for radioactive material. Every state has a role when selecting the routes, the preferred routes under DOT regulations. You got to make sure they line up where the states come together. So there's a lot of things to plan for that don't involve the packaging. When you look at routes, a lot of this will go by rail and there's only so many trunk lines across the country. It goes by interstate highway. It's

surprising how you almost know the routes without knowing the routes.

So, and the last thing I wanted to say is emergency response planning. The states have taken a posture where they want to have specialized training along all the routes. Now, the Nuclear Waste Policy Act provided funding to train first responders along the routes. When we dealt with the states with Private Fuel Storage, there is no requirement. There are no deep pockets to provide emergency response training. So from the standpoint of the states, one campaign would provide all this money for emergency response training. A similar campaign, PFS, would be half as large as the Yucca Mountain -- had no provisions. So, it's those types of issues we discuss and we discuss the packaging when we know about it. So, there's a lot of different -- is that?

COMMISSIONER SVINICKI: Yeah, that's helpful and again, I'll just close by saying I think, too, it's difficult to prepare when you don't know when the campaign will occur. And I think DOE struggled with some of this even with the "deep pockets." There's a lot of turnover in emergency response personnel. You might train one cadre, the shipment campaign is five years later, you know, so that was just my comment. But I'm over my time. Thank you, Mr. Chairman.

CHAIRMAN JACZKO: Commissioner Magwood.

COMMISSIONER MAGWOOD: Thank you. And thank you for your presentations. They were a really excellent group of presentations this morning. I really appreciate that. You actually answered some of the questions I had quite completely before you completed with your opening statements. A few things. You know, as I think about this issue broadly, you know, I kind of look around the room and I see members of the very, very good high-level waste staff here who have been working on these issues for quite some time, but they focus,

as I think you've mentioned through your presentations, on Yucca Mountain. That's been the focus for a very long time. As we start looking at the Blue Ribbon Commission recommendations and you think about opening this up to a broader range of media, how much of what we know still applies? Is it fair to think that the expertise that we've built over 30 odd years can apply whether we look at different types of rock or salt or deep boreholes? I mean, does it all apply or are we starting over? Can you give us some sense of that?

BRITTAIN HILL: Well, certainly Commissioner there are some important differences when you switch to an entirely different geologic media, but I would offer my perspective. I'd say roughly 90 percent of our knowledge, the methods, the tools that we've developed, we're changing some of the parameters when we move to a new site, but a lot of our understanding and advances over those past 30 years is going to be directly applicable to understanding what would go on at a new site. For example, our evolution and understanding of the near field environment, the area within a couple of meters where the waste is in place, the tools that we have now, which have resulted in large part from the Yucca Mountain program, give us a much better understanding of how to approach and refine that near field understanding for any geologic environment within reason. Of course there are some differences, but I think most -- the majority of what we have learned is going to be applicable to our understanding of the challenges with any geologic disposal system.

COMMISSIONER MAGWOOD: So one would think that would put us in good stead to begin thinking about a generic process. And you mentioned that prospect, you know, earlier on, but as you think about doing that, what would -- what are the first steps towards revising Part 60 and establishing a generic

process? What would be the first things we would want to do?

BRITTAIN HILL: Well, certainly I would approach it just like any other rulemaking. We need to do a thoughtful regulatory analysis, do our gap analysis, and see what are the potential regulatory and technical gaps that staff would need to develop additional information to support going to development of a draft rule.

COMMISSIONER MAGWOOD: And how much of that is going to be limited by the Nuclear Waste Policy Act? I think you mentioned that looking at deep boreholes and you didn't mention the salt, for example, retrievability becomes a significant issue. I 'm sure there are probably other issues I'm not even aware of, but -- so how much of the Nuclear Waste Policy Act as it exists today limits our ability to create a generic approach?

BRITTAIN HILL: My personal opinion is that there certainly are some limits imposed by any statutory requirement, but I believe that those limits are workable in that we can develop much of the regulation and either go forward with the draft regulation that can accommodate statutory standard requirements or have a limited focused rulemaking to address those statutory requirements as needed. I think if you look at the history of how we developed Part 63 for all of its challenges, it shows that our process can accommodate small and larger directions to incorporate new information into the regulation, but I believe the gist of what we would need to do in revising our Part 60 can be done in a very policy-neutral, technically-focused framework.

MICHAEL WEBER: Another aspect to emphasize here is that we're not in this alone and our partner agency would be the Environmental Protection Agency, so I think in starting this process early on we would need to

meet with EPA and come to some alignment at a high level about what is the approach that we should collectively use to go about developing a generic standard in EPA's case, and generic licensing requirements from NRC's perspective.

COMMISSIONER MAGWOOD: Listening to -- I appreciate that. Thank you. Listening to Earl's discussion about transportation the first reaction was that maybe we could just do deep boreholes at every site and wouldn't have to worry about transporting anything, but assuming we do have to deal with transportation, what's -- what do you -- how would you assess the situation as it exists today? I mean, we've talked about the effects of long-term storage, but you know, I think we all recognize the system that's in place wasn't exactly put together through a careful, thoughtful, heavily analyzed, and carefully planned process. There's a lot of mix and match out there. Where -- how -- where do you -- how do you assess the situation today? If we were told move everything to consolidated storage site delta, how big is the challenge to do that today?

EARL EASTON: Well, I certainly see that the infrastructure is in place, because I was the one to go out and meet with all these state regional groups. Success of the WIPP program in transportation planning is a lot of the requirements that DOE negotiated with the WIPP program are extra-regulatory. So there are a lot of things that DOE did over and above the regulation to get state acceptance, but for Yucca Mountain, for example, these states have been preparing for over a decade. They have the sophistication where they can run route -- safe the route risk, computers -- there's a certain suite of programs that you can run like RADTRAN and Tragus that will determine exposures along different routes. They have actually run those to determine which routes they

would want to use within the states. They have trained a lot of their emergency response personnel to support the WIPP program, because a lot of these WIPP programs come from states in New England, from the Midwest, from the West, so there's a lot of infrastructure to piggyback on.

The one weakness or the one thing I think you really have to focus on, a lot of these shipments to date have been by truck, by highway. There's not much a large rail campaign and it's a lot different to inspect a truck where you can stop at the state border than to inspect a train. So I think there is an infrastructure there and I think you have to -- oh, one other thing I think you have to expand and I'm sorry for the length, but the WIPP campaign does not have a security component. There's no requirement for escorts and there's no requirement for, you know, withholding information, that sort of thing. So, the infrastructure is there to piggyback off on, I think you really have to, you know, tailor make it.

COMMISSIONER MAGWOOD: What about packaging?

EARL EASTON: Packaging? There aren't many spent fuel casks for transportation in existence. There are designs approved, but you know, a lot of people don't want to build a lot of casks that there's no use for yet. There's no place to ship things, so, but yes, I think we have designs approved that people can go out and manufacture casks, but there's no incentive to do that right now until you actually have somewhere to ship.

COMMISSIONER MAGWOOD: Okay. Just one last question for Alicia. You know, it was interesting hearing your thoughts about the, how the consent approach might impact our stakeholder engagement. And as I understand what the Blue Ribbon Commission is recommending, it’s possible

that one could see a very, very wide range of stakeholder engagements coming out of a siting process, or perhaps multiple sites being looked at more or less at the same time and each, as we were discussing earlier, it isn't just the local area, it's the surrounding area, it's the state, it's different levels of government. I could imagine this being a pretty huge endeavor. Have you given much thought to how big this could get and what kind of resources would be necessary to carry it out?

CATHERINE HANEY: We've given it some initial thought but we haven't really put a specific resource estimate number-wise. One of the things that has cost us a lot of discussion internally is what's the roles and responsibilities because we do need to maintain an independence role as we go into the siting process, but yet we certainly do want to be engaged and available to respond to questions. So as we move forward over the next couple of years with responding to the strategy there are certain things that we do have concerns on. We need to consider, engage the Commission as appropriate but we've not really put pen to paper, but clearly it would be more resources than we do have now allocated in the program.

MICHAEL WEBER: There was a time in the high level waste program where we did have multiple sites and while we didn't do stakeholder engagement as we do today or as we've done with Yucca Mountain, we certainly have some experience where we were moving forward in parallel with the Department of Energy as they went about considering multiple site locations.

I think Yucca Mountain taught us a lot, and it occurred in parallel with the agency learning a lot on how to do stakeholder engagement. And we've been able to apply some of those insights and lessons in new reactor siting and licensing, new fuel facility siting and licensing, decommissioning projects, and

we've also collaborated with our international peers. So we've learned a lot through like the stakeholder confidence forum that Janet Cotra is our chair on. So all those I think give us insights, but fundamentally it'd be a function of what kind of national program would go forward, how many sites, how diverse the locations, all those sorts of things. Britt, you want to add?

BRITTAIN HILL: I just wanted to add the Yucca Mountain perspective of there was great value in our engagement at public meetings to explain NRC's independent role and how we factor into the whole licensing process. There was a lot of confusion that somehow NRC and DOE were almost the same entity, and by being engaged early and often, we're not advocates for a site, but we can ensure that NRC's regulatory and statutory role is appropriately understood by stakeholders. And ultimately I believe that would help facilitate the process forward, even if we don't have a major role in the consent building process for site characterization.

COMMISSIONER MAGWOOD: Okay, fantastic. Thank you very much, thank you.

CHAIRMAN JACZKO: Commissioner Ostendorff.

COMMISSIONER OSTENDORFF: Thank you Mr. Chairman. Thank you all for your presentations. I agree with my colleagues, they're very, very helpful. Alicia, I wanted to start out with a point that you made. On Slide 5 you talked about a potential challenge with having -- getting to some finality on licensing decisions if we have a more adaptive process. So I appreciate you raising that and I wanted to see if either you, or perhaps Britt, had any thoughts on how that challenge might be effectively managed. Whoever wants to take it, it's fine.

BRITTAIN HILL: Well our concern is not with an adaptive process. We believe our regulatory framework is very open and adaptive to new information. Amendments can occur even after a license has been issued. The concern that we would have is leaving some very important decisions, such as design decisions, operational decisions, safety decisions, leaving those as open-ended type decisions. While there is certainly some merit in considering that as being very available for amendment and change in a very straightforward way, it does create a challenge for us in how do you demonstrate regulatory compliance if you don't have a design that is finalized for a construction authorization.

So our concern is not with adaption but more being able to have established criteria for decisions at fixed points when we have construction authorizations, license to receive and possess. Rather than leaving those as sort of open-ended to be determined later concerns.

COMMISSIONER OSTENDORFF: Sorry, am I interpreting your comment to be that adaptive does not necessarily extend to adaptive where changing technical criteria? Are you talking a phased approach to establish technical criteria, let's say under revised Part 60? We heard from the first panel about adaptive being, you know, listening to the communities, looking at various incentive packages, research parks, etcetera, which they are, you know, I'd say the soft side of things, the financial side. But if we don't -- are not able to lock down with the criteria or technically for a repository, then that's a, that would be a real concern.

BRITTAIN HILL: Well, we're aware of specifically focusing on the way it was presented in part of the BRC's report, where they did talk about leaving some of these decisions for design and operations as open ended rather

than here's what we're doing now at our application for construction authorization. We would see coming in say for a construction authorization with a conceptual design as being challenging for us to review and look at the safety significance of issues. Whereas if you come in with a fixed design, recognize that future technology developments may occur, and that we have a regulatory process that allows for amendment and change, that would meet the intent of adaptiveness without leaving design, for example, as an open-ended discussion or an open-ended approach for 50 to 70 years.

COMMISSIONER OSTENDORFF: Okay. Britt let me stay with you for a minute here, and you talked briefly about the Yucca Mountain experience with the technical issue of near field understanding. And I appreciate you raising a concrete example, it's always helpful. If you were to look at the process that this agency employed for the Part 63 development, are there any process changes that you would suggest should be employed in looking at updating Part 60?

BRITTAIN HILL: Well certainly within the processes that we control. I think the early engagement with EPA would be the number one coordination issue that would help in the regulatory development, rather than two agencies sort of going about this as separate with sometimes separate directions, separate strategies. That would certainly be the top concern that I could think of.

COMMISSIONER OSTENDORFF: Okay, so let me ask you two follow-ups to that one.

BRITTAIN HILL: Sure.

COMMISSIONER OSTENDORFF: One, I understand you've had a

recent, your team's had a recent meeting with the EPA staff to discuss kind of where things are, initial exchange of views and the thoughts with proceeding with generic standard development. Is that correct? You all --

BRITTAIN HILL: That's correct.

COMMISSIONER OSTENDORFF: What is your sense as to where the EPA is on their readiness to move forward?

BRITTAIN HILL: I think there is certainly a recognition that EPA's generic requirements in 40 CFR 190 are ripe for discussion. But there's been, just like at the NRC, nothing more than a discussion in concept that we recognize and appreciate the BRC's approach that these revisions are going to be needed.

COMMISSIONER OSTENDORFF: Okay. So that then the part two of this one is just on your NRC hat alone. Not asking you to speak for EPA here, for the NRC hat. How far should this agency go in moving forward to develop generic standards prior to there being any Congressional action on the BRC recommendations?

BRITTAIN HILL: As my personal opinion?

COMMISSIONER OSTENDORFF: Sure.

BRITTAIN HILL: I believe that we can go all the way to final rule. In a policy neutral, technically focused, safety focused, generic regulation. Our regulatory process can allow us to amend that regulation to address some of the specific requirements that may come out of legislation. Unless we're envisioning a model where the revised Nuclear Waste Policy Act is completely different in the way that affects our regulation, I think we have the appropriate statutory framework for going forward. While there's still uncertainty of course in what the standard should be, how you may approach the representative individual for

example, most of the generic aspects, the things that we would be commenting on and receiving public comment upon, can be established in a statute-free, if you will, environment.

COMMISSIONER OSTENDORFF: I want to give Cathy a chance or Mike to add in here if you want to on this.

CATHERINE HANEY: No, other than I would agree with Britt. There's certainly, I think there'll be challenges to moving forward with rulemaking, just as there are with any other rulemakings. Part 63 did not use an advance notice for proposed rulemaking approach. That might be something we would want to consider with this being consistent with trying to engage stakeholders early being not saying a consent based approach to rulemaking but yet an openness and trying to be as predictable and engaging stakeholders earlier. That's something different we did with Part 63. It also increases the resources and the time needed to revise the regulation. Those would be things I would think would be well worthwhile in doing it, and in moving forward staff could provide a proposal to the Commission on the different options for moving forward with a Part 60 that was mentioned in the paper we recently sent up to the Commission. So, I do think that we could move forward with Part 60 now.

COMMISSIONER OSTENDORFF: Okay. Mike you want to say anything?

MICHAEL WEBER: I would only say that we would look to the Commission for direction on whether to proceed. We'd be happy to furnish information and recommendations but it's a fundamental policy decision that you alone can make.

COMMISSIONER OSTENDORFF: Okay, thank you. Cathy I'm

going to go back to you. Well before the BRC report came out you and your team have had the waste confidence rulemaking under way and have been taking significant steps to update that body of work. Now that the BRC report is out is there anything in that report or their approach that might give you pause to reflect upon where you are in the waste confidence rulemaking or any assumptions that need to be revisited or any concerns?

CATHERINE HANEY: I think we have been able to learn from the recommendations of the BRC, and it's caused us to consider whether our approach to the waste confidence and any work in the extended storage areas as well as alternate disposal, are we on the right path? There's been nothing that has caused me and my staff to believe that we're on a wrong approach or that we need a significant deviation from the path that we've been on in the past.

So the BRC report has informed what we've been doing. In some areas has validated what we are doing to position the agency, the information that we plan to provide to the Commission during the summer on where we are with regards to the waste confidence rulemaking and the extended storage and transportation work will obviously be informed by the report. But again nothing that's caused us to think that we need to change direction on what we were working on.

COMMISSIONER OSTENDORFF: Okay, thank you. Thank you Mr. Chairman.

CHAIRMAN JACZKO: Looking at one of the issues where we've I think maybe been ambivalent in our direction is on efforts on reprocessing and I think as I looked at the BRC report, they weren't making any specific recommendations about moving forward with the processing programs. So

maybe Cathy, you can give me a sense some, do you -- does this report have any impact on kind of our low level work on reprocessing? Does it tell you that we should accelerate it or defer it or does it give you any direction, you think, on what we should do with that initiative?

CATHERINE HANEY: I don't believe it gives us explicit direction. Our work on reprocessing right now is very limited by resources. We are a very small number of resources that are supporting reprocessing right now. We're working towards a 2019 rulemaking, and of course that is dependent upon our resources in fiscal year 14 and up being significantly increased from what they are. Right now our effort is focused at enhancing our knowledge with regards to some of the aspects of closing the gaps that were identified in our regulatory framework. So we're working along that path at the level at which our resources support it.

CHAIRMAN JACZKO: As you look at some of these other initiatives, and I think it's a very good suggestion from the BRC for us to begin moving forward on a generic rulemaking for Part 60. Are there common -- are there elements of that initiative that would be common to what we're doing in the reprocessing? Or that would lend themselves to the reprocessing initiative?

CATHERINE HANEY: Tough question. I don't think there is significant overlap between those in moving forward if directed with a Part 60 rulemaking. I'm going to be really pulling to the individuals that still remain on my staff that worked on the Part 63, which is a different skill base than that working on the reprocessing rulemaking. Now that's not to say that I couldn't use the individuals that are working on the reprocessing rulemaking on Part 63 because very highly qualified, knowledgeable staff, but as far as a one-for-one skill match,

it's not a direct comparison.

CHAIRMAN JACZKO: Mike, did you want to say something?

MICHAEL WEBER: If I could add to your question. I think one thing's become apparent to me over the years, and that is that in this area you have to deal with a system of waste management. And so there is an interface between what we would do in reprocessing, and what we would do on generic waste disposal requirements, and what we do on waste confidence, and what we do on storage. And somehow we, the United States, have to have a system that works. And works being it's safe, it's secure, it meets the fundamental objectives that the Blue Ribbon Commission identified. So that there is an inter-lap there between, interface? Between the -- I think inter-lap.

CHAIRMAN JACZKO: Inter-lap, I think interface.

MICHAEL WEBER: Interface between reprocessing work and the repository work. Knowing the waste form. Are we dealing with spent fuel, or are we dealing with vitrified waste? Is it a heat producing waste? Is it a cool waste? You know, all those things I think are interrelated and need to be taken into consideration. Even to Earl's point on the size of the packages that are being used for transportation versus the storage of the waste. Well, from a storage perspective you want to maximize the loading. From a transportation perspective, maybe not, or from a disposal facility, depending if it's a hot or a cool repository. You know, I think it's important for the nation to look at this as a system and not to make individual kind of siloed decisions.

CHAIRMAN JACZKO: Well if the Commission were to tell you in the SRM for this meeting to go forward on a Part 60, you know, to begin that? Do you have the resources now to do that?

CATHERINE HANEY: No.

CHAIRMAN JACZKO: What would you anticipate needing?

CATHERINE HANEY: We are looking at the number of resources that it took to revise Part 63. And we would look to -- we need to gather some additional information on that and to refine it. But initial estimates for that rulemaking, which I would say would probably be much less than would be needed to revive Part 60, but we probably start at close to a 20 FTE desire. Now, how many we need per year is dependent upon how quickly we would be working toward Part 60. So one of the things that I would be -- where I would start, in the officer director role is looking for a plan from the working with my management team for what's the different way to approach a Part 60 rulemaking, and looking at what's a reasonable time period to do it and what are -- and of course we'd need to consider engagement with EPA as Mike said, as well as several other key stakeholders in doing that.

CHAIRMAN JACZKO: Do you have the resources to put together the plan?

CATHERINE HANEY: They would be unbudgeted resources.

CHAIRMAN JACZKO: Okay.

MICHAEL WEBER: Something else would suffer. I think we would propose a phased adaptive approach, if the Commission were to direct us to do that, for obvious reasons because a lot of it depends on what EPA would do. And then as in all things, the Commission balances what work wouldn't be done in order to support the higher priority.

CHAIRMAN JACZKO: So if we were to tell you to do it, you -- what would not be done? I mean if we were to ask you to start putting together a plan,

what would we not do? And we're not talking 200 FTE.

CATHERINE HANEY: No, no, not to put together a plan. There would potentially be some slowdown in the areas of our waste confidence or in our extended storage and transportation work because, again, in going back to my previous statement, I'd be looking to the individuals that had worked on the Part 63 as my experts to rely on in developing that plan and the best way to go forward.

CHAIRMAN JACZKO: Okay, thanks. Turning the -- and I think Britt you used the term a little bit here of, I don't know what the term was you used when you described a Part 60 rule. Though one of the questions I have is to what extent would we be able to do that absent a specific geologic medium? Can you do a geologic neutral rule or do you have to do subparts for different media? To what extent can it be done without that information specified?

BRITTAIN HILL: Well, I think that's one of the advantage of risk informed performance based regulation, is we don't have to come up with the series of deterministic criteria about this level of subsystem performance, or this media has to do this or that. We put it on the result. What is our final resulting total system performance and make the appropriate judgments from there. So I believe that we can come up with an effective and protective regulation that could apply at any reasonably suitable site. And reasonable criteria, of course, has to be in there. It can't be disposed of everywhere in the United States, but within certain very broad technical parameters we can come up with a regulation that'll meet the protectiveness needs.

CHAIRMAN JACZKO: All right. Well, I appreciate that and I think that's very helpful. Earl, I wanted to ask you a question. I think you, you know

where -- the chicken and the egg here to a large extent on the transportation issues, and to a large extent on a lot of these issues is that I think that you posed a question. Is storage driving disposal or disposal driving the storage? What do you think the right answer is?

EARL EASTON: Well, I don't know what the right answer is because I think you can make a case either way. I mean for a long time folks have been optimizing around storage to put their fuel in the least number of casks, to eventually make the least number of shipments. The TAD which was Yucca Mountain was controlling the heat was a lot smaller, and a lot of the utilities were complaining that I have to buy a lot more hardware; I got to load a lot more hardware. But on the other hand, when you took the large casks to Yucca Mountain, you'd have to put them on an aging lot, you might have to repackage some. I think it could work either way but someone needs to probably be the controlling hand and decide.

CHAIRMAN JACZKO: But I just gave you the opportunity to be that and – [laughs]

EARL EASTON: Okay, okay. I like a canister-based system where a utility loads and they never have to open it up at their utility again. And if that means basing the safety on the canister rather than the cladding, so be it. And so that the only person that ever has to open it again is a place called DOE, and when they open --

CHAIRMAN JACZKO: Or a new facility, right.

EARL EASTON: -- or a new facility. And when they open it they decide what to do with it. It looks like we have to repackage it. Well, we can put it in this, but I think that's the ideal system, is the one that would minimize

transportation. The one that would minimize handling so you never have to open the package again and repackage. And I'm not sure I've thought all the way through to see which one that is. I'm going to cop out.

CHAIRMAN JACZKO: Well that, no, that would, I appreciate your sticking your neck out there and I think the -- it's certainly a piece. Now would -- is this something that could, would be incorporated as part of the Part 60 update? Could we impose specifications on, you know, to drive us to a decision about the canister?

EARL EASTON: I've been in the storage and transportation program for 25 years, and every time we would get a new director the first thing we would do is go down to talk to DOE and describe the chicken and the egg, the dilemma that we were with. And we always told them that we didn't think from a regulatory -- I mean from a point of view we should be telling DOE how to manage the overall fuel cycle, but we should have a regulatory framework broad enough to accommodate whatever their decision is. So I would think that it really would be, should be DOE, because they have the ultimate responsibility. And that should be our discussions with DOE. How does it ultimately all piece together? You could possibly have different types of repositories with different types of packaging too, so.

CHAIRMAN JACZKO: Mike did you? Or Cathy, do you want to add something?

MICHAEL WEBER: Well, I was just going to say as a regulator our role, as I understand it, is to establish the safety, security, and the environmental protection requirements. And then as long as whatever system operates in is able to accomplish those fundamental objectives, we're happy, but --

CHAIRMAN JACZKO: Could we get specific enough in that in that we would have arguments to drive to particular solution?

CATHERINE HANEY: I think where you see it is not so much in Part 60 space as in our work on extended storage and transportation, which touches into Part 72. And that's some of the -- we'll have a paper coming up soon to the Commission that's talking about our gaps relative to storage in the 71, 72 interface. And I think you'll see some leading toward that as well as potential policy issues with that. So while I would not put it in 60 space, I think we'll get it through different areas of NMSS.

CHAIRMAN JACZKO: Right, good, well thank you. Well, I appreciate your thoughts. I'll probably put some language in the SRM. We can see if there's support to have us move on the phased adaptive approach to Part 60 regulations and see where we come out because I think it's worth taking the opportunity to begin moving forward on these things. I think it's important for us to do, given all the other things we're doing with extended storage and transportation. I think it makes sense for us to kind of close the circle and think longer term where we're eventually going to go with this. And I think beginning the Part 60 rule, if nothing else, probably help inform that process so we start to put that all together in a comprehensive whole. But again, I appreciate all your thoughts and want to thank all the people from the BRC who are here. General Scowcroft for you being here today and sticking around to hear us get into the details a little bit, and appreciate all the work that you did on the Commission. I think it's a very valuable document for all of us and a good blueprint for us to go forward, so. Any other comments or questions? Okay. Thanks everybody. We're adjourned.

[Whereupon, the proceedings were concluded]