UNITED STATES NUCLEAR REGULATORY COMMISSION

BRIEFING ON LOW-LEVEL WASTE PROGRAM, PART 1

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FRIDAY

April 17, 2009

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The Commission convened at 9:30 a.m., the Honorable Dale E. Klein, Chairman presiding.

NUCLEAR REGULATORY COMMISSION

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STEVE GARRY, Senior Health Physicist, Reactor Inspection Branch, NRR

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FRANK MARCINOWSKI, Deputy Assistant Secretary for Regulatory Compliance, Office of Environmental Management, U.S. Department of Energy

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

CHAIRMAN KLEIN: Good morning. I think this will be low-level waste day; that we have a lot of discussions. We'll hear from obviously our NRC staff first and we'll hear from our other Federal partners and then this afternoon from the states and industry, academia and public industry groups.

And so, we'll hear from the NRC staff this morning and then we'll shift to our DOE partners and then this afternoon -- obviously I want to thank in advance the state regulators for making their trips in. So, we'll have a very active day, I think, learning about the low-level waste activities.

Any comments before we start? Marty, would you like to begin?

MR. VIRGILIO: Thank you, Chairman and good morning to you and good morning to the Commission. We welcome the opportunity to talk to the Commission today about our low-level waste program.

At least from my 10 years association with this program there's always been a high degree of interest, but I believe the interest has stepped up in light of the recent closure of the Barnwell facility in South Carolina to non-compact states, and a concern about ensuring that there's adequate disposal options for all types of radioactive waste.

There's, I think, an enormous amount of stakeholder interest in this area today and I think you'll hear it as we proceed through the day with the panels that you've mentioned.

I think you are familiar with some, if not all of, the people at the table, but I'd

like to take the opportunity to introduce the staff representatives that will be presenting to you today.

First, on my left is Larry Camper who is our Director of the Division of Waste Management and Environmental Protection within our Office of Federal and State Materials and Environmental Management Programs.

To his left is Dan Collins who is our Deputy Director from the Division of Nuclear Materials in Region I.

And to his left is Mike Ryan who is an expert in this area and is currently serving on our Advisory Committee for Reactor Safeguards.

To my right is Jim Kennedy who is our senior expert and project manager in Low-Level Waste Branch in our Division of Waste Management and Environmental Protection.

To his right is Steve Garry who is a senior health physicist in our Reactor Inspector Branch and our Office of Nuclear Reactor Regulation.

And at the end of the table John Buckley who is a Senior Project Manager in the Reactor Decommissioning Branch in our Division of Waste Management and Environmental Protection.

The staff today is going to provide you with an overview of the current status of NRC's activities in the low-level waste program and this will be followed by presentations from representatives from the Department of Energy.

This afternoon you'll hear from state regulators, low-level waste generators and from a range of stakeholders including representatives from the Nuclear

Information and Resource Service.

I think at this point it's appropriate just to begin with Larry's presentation. Let me turn it over to you, Larry.

MR. CAMPER: Thank you, Marty. Good morning, Chairman, Commissioners. We welcome this opportunity to provide the Commission with a timely briefing on the status of NRC's low-level radioactive waste LLW program. I will refer to it as "the program".

The briefing today includes staff from the NRC, staff from Federal and state regulators and a broad spectrum of stakeholders. We will strive to limit our use of acronyms but, of course, from time to time we do and therefore the briefing package contains a list of acronyms and this information along with all the slides is available on our public website. Slide number 2, please.

I will provide a brief overview of the program. Jim Kennedy will discuss the status of activities in the program including certain actions identified in the 2007 LLW Strategic Assessment. Steve Garry will discuss management of LLW at operating power plants. John Buckley will address reactor decommissioning including anticipated waste capacity required in the future. Dan Collins will discuss the regional perspective on low-level waste and sealed sources. And Dr. Mike Ryan will discuss risk informing LLW management. Slide 3, please.

Following the Commission Q&A session we will then be joined by Frank Marcinowski of the Department of Energy and Abigail Cuthbertson of the National Nuclear Security Administration to discuss DOE's National LLW Program and

Sealed Source Recovery Program. Slide 4, please.

My overview of the program will include certain key messages, our major accomplishments, the rationale behind the strategic assessment, stakeholder outreach, and certain challenges facing NRC's program.

The Commission last examined the program and provided direction to the staff on the role of the program in 1997 as part of the Agency's strategic assessment and rebaselining initiative. This effort was initiated by the Commission and examined all major programs in NRC.

Much has transpired since that time so the staff certainly welcomes this opportunity to provide you with current perspectives on the program. Slide 5, please.

The program is contained within one business line, LLW and decommissioning, of the new budget model but creates products in three categories: oversight, rulemaking and research.

In addition, the program certainly influences the international arena through our efforts devoted to reviewing International Atomic Energy Agency (IAEA) standards and guidance and our efforts as the U.S. representative to the Waste Safety Standards Advisory Committee at the IAEA. Slide 6, please.

There are six key messages that I would like to convey today. The first three are as follows: First, the program is in a maintenance mode as directed by the Commission in 1997. This means that based on NRC's role in the National program at that time the Commission chose to maintain a program of 5 to 10

full-time equivalents, FTE, to perform such activities as providing technical assistance to the states, reviewing Agreement State programs and reviewing low activity waste disposal requests. Research, topical report reviews and new guidance developed were curtailed or severely limited. Currently, the program is staffed with 5 FTE. Slide 7, please.

Even though the program is in a maintenance mode it nonetheless faces many external and internal pressures as depicted. Externally, stakeholders such as Congress, the Government Accountability Office (GAO), the states, the international community and others recommend or require that NRC take certain actions.

Certain noteworthy examples are the 2004 GAO report entitled "Low-Level Radioactive Waste: Disposal Availability Adequate in the Short-term, but Oversight Needed to Identify Future Shortfalls".

In that report GAO suggested that the Congress may wish to consider directing the Nuclear Regulatory Commission to report if LLRW conditions change enough to warrant legislative intervention.

In 2007, GAO issued another report recommending among other things that the NRC and DOE report to Congress on the usefulness of developing a U.S. radioactive waste management plan.

In contrast there are many internal influences including other NRC programs dealing with LLW issues. For example, the ACNW has written more than a half-dozen letter reports on LLW in the past five years with

recommendations for improving the LLW regulatory program. Slide 8, please.

The third message is that low-level waste volume has been substantially reduced during power plant operations between 1980 and 2000 as depicted in this slide. Although this slide is based upon pressurized water reactors (PWRs) it is representative since a similar pattern exists for boiling water reactors (BWRs) as well.

In addition, large quantities of primarily Class A waste have been disposed of during decommissioning of either nuclear power plants or complex material sites as well as during normal operations.

Today, LLW is being safely managed including long-term storage of Class B and C waste since the closure last summer of Barnwell to generators in 36 states. Slide 9, please.

The fourth message deals with the fact that there is currently adequate disposal capacity for Class A, B and C low-level waste; however, there is a lack of disposal access for Class B and C waste due to the closure of Barnwell.

The next key message is that there is no disposal pathway at this time for Greater Than Class C (GTCC) waste. GTCC waste is either stored on-site in dry cask storage, such as activated metals resulting from reactor decommissioning or otherwise stored on-site as is the case with sealed sources.

However, the DOE has issued a notice of intent for an Environmental Impact Statement to evaluate the alternatives for GTCC waste disposal. Once DOE completes its evaluation and receives direction from Congress on a course of

action the NRC is obligated to review the license application or applications for such facilities.

Finally, the last key message is that the current waste classification system in 10 CFR Part 61.55 created in 1981 could be more risk informed and performance based. For example, it could be modernized by using updated modeling and performance assessment techniques to evaluate and revise the existing waste classification table for all radionuclides.

Toward this objective the Commission in SRM 08-0147 directed the staff to budget for resources to risk inform the 10 CFR Part 61 waste classification framework with conforming changes to the regulations as needed using updated assumptions and referencing the latest International Committee on Radiation Protection (ICRP) methodology.

In carrying out this direction the staff plans on considering the full range of possibilities including the new waste classification system employed by the IAEA in Safety Guide No. 111-G-1.1 assuming the Commission believes this is an appropriate consideration. Slide 10.

Accomplishments. Over the past few years the staff completed the strategic assessment of the program, completed the Regulatory Information Summary for fuel cycle material licensees for interim storage, performed the depleted uranium analysis in support of SECY-08-0147, modified inspection procedure 84900 to address long-term storage of Class B and C waste, and completed the waste control specialist exemption review regarding land ownership

of that disposal site.

We also assisted NRR in its review of the storage guidance submitted for NRC review by the Nuclear Energy Institute (NEI) and the Electric Power Research Institute (EPRI). Slide 11, please.

The staff's strategic assessment was undertaken in 2006 and 2007 because of the external and internal pressure cited earlier and because of the need to prioritize work assignments given the limited resources assigned to the program.

We performed a rigorous analysis of 20 issues and shared these with the Commission in SECY-07-0180. The staff identified seven high priority tasks which Jim Kennedy will discuss in more detail during his presentation. Slide 12.

A cornerstone of our work for the overall program is stakeholder outreach. For example, such outreach was an integral part of our LLW strategic assessment. Furthermore, in developing recommended changes to the regulatory framework we held extensive consultations with the Agreement States that regulate low-level waste.

In addition, we have met with NEI and EPRI in public meetings to discuss a variety of topics including guidance on interim storage of Class B/C waste.

We also considered the views of other stakeholders such as WCS, Studsvik, public interest groups on a myriad of topics associated with the program. Slide 13.

In closing, we've identified three challenges worth noting. First, industry

innovations designed to reduce LLW volumes or modify waste classification to facilitate disposal may require policy consideration by the Commission.

Second, there will be challenging LLW rulemakings before the Commission such as those dealing with depleted uranium and risk informing the waste classification system that will require considerable Commission attention once those efforts begin in earnest. Another important issue for Commission awareness will be the question of blending and its impact upon waste classification.

Finally, there is a substantial external interest in the program including congressional interest that we will need to focus upon, anticipate to the extent possible and provide adequate answers to address any concerns that emerge.

That concludes my remarks. I'll turn our presentation over to Jim Kennedy who will provide more detailed comments on the status of the program. I appreciate your attention. Thank you.

MR. KENNEDY: Thank you and good morning. Today I will address the following areas. First, the Low-Level Radioactive Waste Policy Amendments Act of 1985, which I'll refer to as "The Act".

Second, short and long-term disposal capacity in the U.S.

Third, the low-level waste strategic assessment that we conducted.

Fourth, some emerging policy issues.

And fifth, some concluding remarks. Slide 2, please.

The Low-Level Radioactive Waste Policy Act was passed in 1980 and

amended in 1985. It assigns states the responsibility for disposal of Class A, B and C low-level waste either by themselves or in cooperation with other states through the formation of regional compacts.

Under the Act the compacts have the authority to restrict the use of their regional facilities to the disposal of waste generated within their compact. To date, there have been more than a dozen new disposal facilities planned by the states and compacts, but no new facilities have yet been developed under the Act. This could change in the near future.

Texas recently approved an order granting the application of WCS for a low-level waste disposal facility license. The license can be issued after the applicant has acquired the mineral rights on the underlying land.

After that the company must fulfill preconstruction license conditions and build a facility before beginning operations. The facility will accept commercial waste from generators in the States of Texas and Vermont when it begins operation.

Because of this limited progress under the Act some stakeholders have called for revisions to the Act and some have also urged NRC to initiate legislative changes. To date, NRC has not done so consistent with the limited role for NRC in the 1997 Commission decision that Mr. Camper discussed. Next, I will address low-level waste disposal capacity. Slide 3, please.

Disposal capacity is a complex subject. It requires consideration of current generation rates, disposal facility limitations, new disposal and waste processing

options that may be developed, and new waste streams. Slide 4, please.

It also involves consideration of changes in waste generation rates over time and the amount of waste that DOE disposes of in commercial facilities. Forecasting short and long-term capacity involves a large number of assumptions concerning these variables and if you'd like to know more about the assumptions we've made I can answer any questions that you have after the presentations today.

We addressed four broad categories of waste. We defined waste category in this context to mean those low-level wastes that may utilize separate and distinct types of disposal facilities.

The four categories then are, first, GTCC waste; second, Class B and C waste; third, Class A waste that can be disposed of in a licensed facility such as the Clive, Utah facility; and fourth, low activity waste. That is waste that can be safely disposed of in a Resource Conservation and Recovery Act disposal facility and which is a subset of Class A. Slide 5, please.

First, I'll discuss current generation rates for the four waste categories. The amount of GTCC waste generated is on the order of several thousand cubic feet per year, maybe a little bit less, or approximately the size of a living room in a home.

For Class B and C waste the recent average has been 25,000 cubic feet per year or somewhat more than 10 times the amount of GTCC waste.

Class A waste disposed of in licensed facilities accounts for an average of a

little more than 3 million cubic feet per year over the last five years or more than 100 times the volume of Class B/C waste and 1,000 times the volume of GTCC waste.

The volume of low activity waste disposed of is not tracked, but we believe it's on the order of or somewhat more than Class A disposed of in licensed disposal facilities. Slide 6, please.

For GTCC waste there is no current disposal capacity and Mr. Camper described the steps that DOE has to take to develop this capacity. Disposal of GTCC waste is likely a number of years away.

For generators located in compacts with access to regional facilities in South Carolina, Washington and in the future, Texas, they have or should have disposal capacity for Class A, B and C waste in the near term and the long-term.

The disposal of Class B/C waste for most other U.S. generators is both a near and potentially a longer-term challenge. At this time there are no firm prospects for disposal. One can speculate on what might happen particularly regarding compact restrictions. We will note that the compacts have the authority to determine whether out of compact waste will be admitted to their regional facilities.

For disposal of Class A waste the EnergySolutions Facility in Clive, Utah is available to almost all U.S. generators with approximately 150 million cubic feet of disposal capacity remaining. The licensee has stated this capacity would last for another 20 to 30 years.

Class A waste disposal may become a challenge in the longer-term particularly when power reactors begin to decommission.

For waste that is so low in hazard that it could be safely disposed of in a RCRA facility only a few such facilities take most of the Atomic Energy Act low activity waste at this time. Potentially many more could if they were willing; however, using RCRA facilities that have not previously accepted low activity waste can be difficult especially obtaining public acceptance. 10 CFR 20.2002 is the primary mechanism by which these types of disposals are authorized by NRC. Slide 7, please.

The generation rates of low-level waste may change in the future and thereby affect remaining disposal capacity. First, new types of commercial facilities such as enrichment plants and reprocessing facilities will create new waste streams and more low-level waste.

And second, when the existing 104 operating reactors are decommissioned very large amounts of low-level waste on the order of 50 million cubic feet could be generated over about a 20 year period. Slide 8, please.

Let me summarize what we see as the current challenges for short and long-term disposal capacity in the U.S. First, for Greater Than Class C it will be some years before disposal can actually occur.

The second, Class B/C waste, is a challenge both in the near-term and potentially the longer-term. It's worth noting that new disposal options have become available in the past in response to a need.

Third, Class A waste disposal might be a challenge in the long-term particularly if and when reactors began to decommission several decades from now.

And finally, low activity waste disposal can be a challenge in obtaining public acceptance for facilities that haven't previously received such waste to the extent that licensees avail themselves of this option in the future.

I would like to now address the low-level waste strategic assessment. We conducted a transparent process for it beginning in 2006 and documented our results in October of 2007 in a Commission paper. We obtained significant stakeholder input both in writing and in a two-day workshop.

We identified 20 activities that the staff could potentially perform ranging from developing internal procedures to making major revisions to 10 CFR Part 61. We rigorously analyzed these tasks and we ranked them based on their contributions to the agency's strategic objectives at that time of safety, security, openness and effectiveness. Slide 9, please.

We identified seven high priority tasks and these are four of them. Slide 10, please.

These are the remaining three. I'm going to focus on the two which are underlined. The first task is a follow-on to the depleted uranium disposal analysis that we completed last fall.

And the second relates to the blending issue which is a part of our updating of the branch technical position on concentration averaging. If you'd like to

discuss any of the other tasks I can do so during the question and answer session. Slide 11, please.

You know that last fall we completed our analysis of the disposal of depleted uranium from enrichment plants. In the Staff Requirements Memorandum issued on March 18, 2009 the Commission in addition to directing us to perform a limited rulemaking for depleted uranium also directed us to budget resources for a comprehensive revision to risk inform the Part 61 waste classification framework.

As part of that effort we plan on examining the IAEA Waste Classification Safety Guide No. 111-G-1.1 of which a revision will be published in the near future. Of interest is that the guide for the most part does not have numerical limits like Part 61. It's for specific sites, not just generic ones, and does not subdivide low-level waste into subclasses analogous to A, B, C.

We'll also consider the thoughtful views and recommendations that the ACNW has provided over the years. Revising the waste classification system could have significant impacts for low-level waste stakeholders and will likely raise policy issues.

In the future we intend to extensively engage our stakeholders so that we fully understand the impacts of any potential changes. Slide 12, please.

Another issue of interest to a number of stakeholders is blending of low-level waste. There are industry proposals for increased blending including one that's based on current NRC guidance. Blending raises regulatory and

technical issues including some for potential Commission consideration as well.

For example, blending can decrease the volume of waste and storage and facilitate safe disposal of waste, but at the same time increased blending would appear to be contrary to prior Commission statements that discourage it. The staff is currently analyzing these issues and plans to communicate with the Commission in the near future about its findings. Slide 13, please.

I opened with a discussion of disposal capacity and challenges to the National program to provide for safe disposal of all low-level waste types. Our NRC low-level waste program is focused on specific tasks identified in the strategic assessment that we can undertake to continue to ensure safety, to risk inform our regulations and guidance, to potentially facilitate disposal of some waste in the process, and to ensure that the regulatory framework adapts to changes in the National program.

We're aware that the Commission particularly after today's meeting may have further direction and we look forward to working with the Commission on these important low-level waste challenges.

Steve Garry will now address management of low-level waste at nuclear power reactor sites. Thank you. Steve?

MR. GARRY: Thank you, Jim. Good morning, Mr. Chairman and Commissioners. My name is Steve Garry. I'm a Senior Health Physicist in the Office of Nuclear Reactor Regulation in the Division of Inspection and Regional Support.

My key messages are: prior to Barnwell closing most Class B/C waste was removed from storage at reactor sites and shipped to Barnwell for disposal. Class B and C waste that's currently being generated is being safely stored at reactor sites and that some Class B/C waste is being transferred from reactor sites to an offsite radwaste processor for volume reduction to a stable Class B/C waste form.

After volume reduction the plan is that the waste will be shipped for interim storage, not disposal, at Waste Control Specialists in Texas. Ultimately, it will be disposed when a disposal path becomes available. Slide 2, please.

As recommended in the Low-Level Waste Strategic Assessment NRC issued Regulatory Issue Summary 2008-32 for low-level waste storage at reactor sites. The Regulatory Issue Summary consolidated previous NRC low-level waste guidance and communicated to licensees the NRC's staff position continues to be that low-level waste storage must meet NRC requirements for ALARA, monitoring, labeling, and record keeping; that when constructing new low-level waste storage facilities the 10 CFR 50.59 requirements for evaluating proposed changes to facilities must be met. Slide 3, please.

The power reactors and research and test reactors are licensed to store radioactive materials and do not need a separate Part 30 license. Slide 4, please.

The Regulatory Issue Summary also had safe storage considerations in that container integrity must be ensured to prevent container corrosion during storage. And that packaging and storage of low-level waste must be designed to prevent generation of explosive gases. Slide 5, please.

NRC has provided guidance on the construction of new low-level waste storage facilities in Regulatory Guide 1.143 titled "Design Guidance for Radioactive Material -- Radioactive Waste Management Systems, Structures and Components." Slide 6, please.

In 2008, the Electric Power Research Institute completed development of guidelines for operation of low-level waste storage facilities. The EPRI guidance included considerations for interim low-level waste storage.

The EPRI guidelines also acknowledged that volume reduction and concentration of Class B/C waste to Greater Than Class C waste is technologically feasible. EPRI submitted the low-level waste guidelines for operating low-level waste storage facilities to the NRC for review.

NRC reviewed the EPRI guidelines -- slide 7, please -- and found that the EPRI guidelines were consistent with the NRC guidance for storage of low-level waste. However, NRC did not take a position on the volume reduction and concentration of Class B/C waste to Greater Than Class C waste.

I want to note, too, the power industry has no immediate plans for concentrating Class B/C waste to Greater Than Class C. Slide 8, please.

Some Class B/C waste is being transferred from power reactor sites to an offsite radwaste processor named Studsvik in Erwin, Tennessee. Studsvik is licensed by the Agreement State of Tennessee. Studsvik is accepting Class B/C waste, co-mingling the waste from different generators and volume reducing the waste to a stable Class B/C form. Slide 9, please.

The Studsvik license makes the new stable waste form attributable to Studsvik. Attributable means that the State of Tennessee considers Studsvik the generator of the new stable Class B/C waste form.

Interim storage, not disposal, of the stabilized waste is planned at Waste Control Specialists in Texas. Waste Control Specialist has a license to store radioactive waste in addition to their anticipated license for disposal of in-compact waste.

Studsvik has stated that they have a contract with Waste Control Specialists including financial assurance for interim storage until a final disposition path becomes available. The first shipment of processed waste from Studsvik is expected this month to Waste Control Specialists. Slide 10, please.

Another radwaste processor, Duratek in Oak Ridge, Tennessee is considering blending. Duratek is also licensed by the State of Tennessee. Duratek is conducting a state approved temporary pilot test that could result in the blending of Class B/C waste into Class A waste. The Class A waste could potentially be disposed then at the EnergySolutions facility in Clive, Utah. Slide 11, please.

In conclusion, the Class B/C waste is being safely stored at reactor sites. NRC has guidance in place for on-site low-level waste storage and operating plants are using the EPRI guidance for operating the low-level waste storage facilities. Slide 12.

Alternately, Class B/C waste is being transferred from reactor sites to the

offsite radwaste processors. Class B/C waste is being transferred currently to Studsvik and volume reduced to a stable form. The waste will then be shipped for interim storage at Waste Control Specialists in Texas.

The second option is pilot testing is ongoing at Duratek for potential blending of Class B/C waste. The waste would then be potentially disposed at EnergySolutions facility in Clive, Utah.

Thank you for your time and interest and John Buckley will now address reactor decommissioning.

MR. BUCKLEY: Good morning. Thank you, Steve. This morning I will discuss the reactor decommissioning program and the volume of low-level waste generated during decommissioning. Slide 2, please.

Currently, there are 14 power reactors undergoing decommissioning. The staff's decommissioning activities are accomplished in accordance with 10 CFR Part 50 and 10 CFR Part 20 Subpart E following guidance provided in two primary documents: NUREG-1757 titled "Consolidated Decommissioning Guidance" and NUREG-1700 titled "Standard Review Plan for Evaluating Nuclear Power Reactor License Termination Plans".

Although NUREG-1757 is applicable to decommissioning material licensees sections dealing with the decommissioning criteria, surveys, NEPA compliance, release of solid materials, on-site disposal and intentional mixing of contaminated soils are also applicable to reactor licensees. Slide 3, please.

To date there are nine power reactors which have completed

decommissioning activities. Three of the nine reactors, Fort St. Vrain, Pathfinder and Shoreham completed their decommissioning activities prior to promulgation of the license termination rule by meeting the concentration-based released criteria provided in Regulatory Guide 1.86 titled "Termination of Operating Licenses for Nuclear Reactors".

The remaining six reactors: Big Rock Point, Connecticut Yankee, Maine Yankee, Saxton, Trojan and Yankee Rowe were decommissioned in accordance with the dose-based criteria of the license termination rule. Slide 4, please.

Reactor decommissioning produces a lot of waste, both radioactive and nonradioactive. Nonradioactive material for general disposal can be shipped to local landfills; however, because licensees must demonstrate the material going to local landfills has no detectable amounts of radioactive material a number of licensees choose to ship their solid waste to vendors specializing in the management of low-level waste or to low-level waste sites such as at Clive, Utah.

Low-level waste generated during decommissioning consists of material contaminated with radionuclides such as rags, papers, filters, solidified liquids, ion exchange resins, equipment, dirt, construction rubble, concrete and piping.

Given the current challenges of low-level waste disposal and capacity and availability it's important to have an estimate of the volume of low-level waste to be disposed of from decommissioning the reactors in the future. The volume of low-level waste generated during radioactive decommissioning and dismantlement is generally a function of three things.

First, the decommissioning method chosen by the licensee. Second, the reactor operating history. And third, the reactor type. However, it is difficult to accurately predict the volume of low-level waste generated that will be generated during reactor decommissioning.

One way to estimate the volume of low-level waste is by examining the waste volumes from reactors already decommissioned. Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities, that's NUREG-0586, used information from licensee post-shutdown decommissioning activity reports and license termination plans to estimate the volume of low-level waste that will be generated for each activity of waste.

Based on this licensee information it was estimated that decommissioning would produce 42,500 cubic feet of high activity waste, 26,500 cubic feet of low activity waste, and 191,000 cubic feet of very low activity waste for a total of 259,900 cubic feet.

This volume does not include nonradioactive demolition waste; that is waste that has no detectable residual radioactivity. Estimates of the volume of low-level waste generated during decommissioning can also be obtained from the decommissioning cost estimates that are submitted by licensees to the NRC annually.

NUREG-1307 titled "Report on Waste Burial Charges" provides updated disposal costs for reference PWR and BWR based on estimated disposal volumes. NUREG-1307 estimates that disposal volumes for a referenced BWR to

be approximately 670,000 cubic feet and approximately 650,000 cubic feet for a referenced PWR. Slide 5, please.

Reactor decommissioning waste has a number of possible disposal paths. Low activity waste such as demolition debris and soil can be disposed of at low-level waste disposal facilities or buried in a landfill -- municipal or state landfills in accordance with approved disposal procedures submitted in accordance with 10 CFR Part 20.2002.

Class A waste such as piping, demolition debris, soil, pavement, contaminated clothing must be disposed of at a low-level waste disposal facility such as EnergySolutions, Clive, Utah, U.S. Ecology in Hanford, Washington or WCS in Texas.

Class B/C waste such as processed liquids, steam generators, pressurizers, dewatered resins, dewatered filters, irradiated components, and reactor internals must be disposed of at low-level waste disposal facilities.

However, unlike Class A waste not all low-level waste disposal facilities will accept Class B/C waste from all reactors. Lack of disposal options for Class B/C waste has forced many reactors to store this Class B/C waste on site.

GTCC which is composed mainly of reactor internals is stored on site in dry storage canisters in an independent spent fuel storage installation until it can be transferred to DOE with the spent fuel. Slide 6, please.

This EPRI 2006 graph shows a projected low-level waste disposal volumes resulting from rector operations and decommissioning. Currently, there are 104

operating power reactors. Assuming that each reactor has a 60 year operating life it is anticipated that 35 reactors will shut down between 2030 and 2034. If each of these reactors begin immediate decommissioning and dismantlement the volume of disposable low-level waste will increase dramatically beginning in about 2035.

However, since reactors have up to 60 years to complete decommissioning the peak disposal volume could occur further into the future. Slide 7, please.

In concluding my presentation, I would like to emphasize the following points. Currently, there are adequate waste disposal options available for Class A reactor decommissioning waste.

Two, disposal options for Class B/C reactor decommissioning waste is limited, thereby requiring many reactors to store this waste on site.

And three, there's a large volume of reactor generated low-level waste on the horizon which will require disposal.

This morning's next speaker is Mr. Dan Collins.

MR. COLLINS: Thank you. Today I'll provide a snapshot of what NRC inspectors are seeing relative to storage and disposal of low-level waste and sealed sources. Slide 2, please.

NRC inspection activities for low-level waste cover a wide spectrum of licensees from power reactors to materials facilities in non-Agreement States. Inspection of low-level waste management is largely captured in the existing safety inspection procedures for the various licensee types and ensure that low-level waste is stored and controlled in a secure and safe manner and that radiation

levels and adjacent unrestricted areas do not exceed NRC limits.

They also ensure that waste management complies with regulations and license conditions and that waste storage containers are properly labeled.

Additionally, two inspection procedures have been revised to include assessment of whether licensees appropriately consider radioactive material they hold as waste in determining the applicable security requirements. These procedures apply to some materials licensees, decommissioning power reactors and fuel cycle facilities.

Since 2000, NRC inspectors have identified few violations related to low-level waste storage and disposal and handling that resulted in escalated enforcement. It is important to note that NRC inspectors do not collect data on waste classifications or quantities, however, power reactor licensees do provide that information annually. Slide 3.

As Mr. Buckley noted decommissioning activities generate large volumes of Class A waste. We have observed that licensees process this material safely and have effective controls to limit the spread of contamination and limit worker exposure to elevated dose rates.

NRC inspections also verify the accuracy of licensee site characterization which in turn helps us to assess the adequacy of the licensee's planning for decommissioning activities. We have observed that licensees are effectively implementing their decommissioning plans and appropriately planning activities to minimize waste generation.

Fortunately, many major decommissioning projects were completed while licensees still had access to Class B and C disposal facilities. Overall, there currently does not appear to be a major backlog of low-level waste from decommissioning activities.

There are, however, cases where licensees are constructing on-site storage buildings for their Class B and C waste. This is the case for Rancho Seco, also the licensee for San Onofre Unit 1 and storing that unit's reactor pressure vessel on site due to a lack of disposal options. Slide 4.

Recent waste management experience at materials licensees varies depending on the licensee type and location. Overall, NRC inspectors are not seeing significant waste issues in the U.S.

Licensees whose use of radioactive material is primarily portable gauges generate little if any waste. Medical treatment facilities that use short half-life isotopes typically use small quantities of material and use decay in storage long enough to use a nonradioactive disposal path.

Other commercial and research and development licensees primarily generate Class A waste that can be disposed of at the Utah facility. The majority of licensees that do generate Class B or C waste anticipated Barnwell's closure and revised their processes to reduce waste generation. They also cleaned out their facilities before the closure.

Where there are cases of Class B and C waste being stored we're seeing that the quantities are small and licensees are storing it adequately. Large broad

scope licensee in most cases have facilities that meet the guidance of Information 90-09.

Furthermore, research and development facilities have seen a great reduction in the amount of radioactive material used for research purposes. Licensees simply aren't generating the volumes of waste that they did in the past.

We note, however, that packaging guidance is important for licensees' ability to plan for eventual disposal of their Class B and C waste. While we know what today's packaging requirements are we don't necessarily know the future requirements and that creates uncertainty for licensees in their planning for the eventual disposal of the waste.

The situation for materials licensees in Puerto Rico, however, is different than that of licensees in the U.S. In most cases these licensees have no option to transport radioactive material off of the island -- radioactive waste material off of the island. There are currently no waste brokers willing to ship material from Puerto Rico to disposal facilities in the U.S. and we believe that this is largely due to economic considerations.

Some Puerto Rican companies that also have a presence or have affiliates in the U.S. might have the ability to ship waste material to their U.S. facilities. Unfortunately, we don't know how frequently that occurs. There is one company in Puerto Rico that has ceased operation, but still maintains an NRC license because they are unable to properly dispose of one drum of waste. Slide 5, please.

With regard to sealed sources we are seeing that they are predominantly

being returned to their manufacturers, properly transferred to other licensees, or captured through the DOE NNSA offsite source recovery project with significant assistance from the Conference of Radiation Control Program Directors.

To illustrate the success of that project as of December 2008 20,000 sources have been gathered from over 700 sites nationwide. There are now approximately 9,000 unwanted sources that are registered with the project that are being safely and securely stored at licensee facilities until they are collected. We will continue to monitor the storage of the sources through the inspection program. Slide 6, please.

Finally, for reactor facilities we have looked at both the experience of power reactors and research and test reactors. For power reactors the Class B and C waste are generally used ion exchanger resin or irradiated reactor components. Resin waste generation is on the order of 100 to 150 cubic feet per reactor per year and licensees are currently able to manage the material safely and securely on site or blend the waste to Class A and ship offsite for burial.

For irradiated components such as BWR control blades licensees are able to safely store the items in their spent fuel pools and typically clean the items out of there pools once every five to seven years.

Some licensees are looking at means of storing reactor components in dry fuel storage canisters rather than incurring the cost of storage at on-site interim storage facilities. Slide 7.

For research and test reactors the inspectors in the Office of Nuclear

Reactor Regulation report that they are not seeing a large buildup of Class B or C waste at these facilities. Typically these facilities produce very little of this waste and many of them that do shipped material they had to Barnwell prior to the Barnwell closure. They also transferred sources they had to DOE.

Additionally, research and test rector licensees have found ways to minimize waste generation; however, there is a concern in the community for contingencies. Licensees note that disposal options will be needed in the future. Slide 8.

In summary, the overall view from NRC inspectors is that there's a minimal backlog of low-level waste at licensee facilities in the U.S. The DOE NNSA offsite source recovery project has been highly effective with significant assistance from CRCPD and licensees in Puerto Rico need disposal options.

Finally, NRC inspectors will continue to maintain awareness of waste issues through the inspection process and share information with key internal and external stakeholders.

I'll now turn it over to Mike Ryan who will discuss risk informing low-level waste management.

DR. RYAN: Good morning, Mr. Chairman and Commissioners. Thank you for having me here today to talk about risk informing low-level radioactive waste. I believe the views I'll offer you today are consistent with the ACNW and ACNW&M letters from the past. And I should point out that the ACRS has yet to take up the low-level waste topic, so it doesn't reflect what the ACRS

thinks at the moment although the agenda is gaining. So, thank you.

There are three regulatory requirements that I'd like to discuss today. First, is 10 CFR 61.41 that provides the principle protection requirements for members of the public. This part principally provides the dose limit for members of the public from all pathways of exposure that were analyzed during the draft and final environmental impact statements during the rulemaking in the late 1970's and 1980's. The current dose limit is 25 millirem per year and is based on the ICRP-2 dose methodology.

It is from these analyses that the requirements for waste concentrations were developed in Part 61.55, the Waste Classification Tables. These results arise from a deterministic and conservative bounding case analysis for a generic site that was used in the draft and final EIS.

It is my view that the regulations in Part 61.58 wisely provide for alternative requirements for waste classification. I believe that this provision is important since the management of low-level radioactive waste has evolved significantly since the 1970's. Next slide, please.

The two risk metrics they used to evaluate risks when processing, packaging, transporting and disposing radioactive materials are typically radionuclide concentration and the total quantity of radioactive material present. In the next few slides I'll give you some examples when these metrics are useful and when they are not so useful. Next slide, please.

Concentration is a very useful metric for determining radiation protection

requirements for workers involved in handling waste materials. It is the parameter typically used to estimate dose rates in and around waste packages and transport vehicles so the compliance with worker dose limits in transportation requirements can be demonstrated.

Concentration is not such a good metric for disposal risk. For example, at the limits a very high concentration of small quantities of radioactive material or large amounts of very dilute concentrations can have very different risks once disposed for the same total amount of radioactivity.

Current regulations and disposal site criteria recognize this factor with provisions for some concentration averaging that have been discussed in earlier, so I won't repeat them. Next slide, please.

Quantity disposed is a more appropriate metric for risk in disposal. In the aggregate disposal risk is the risk associated with those radioactive materials that escape or are assumed to escape from the controls provided by all features of the disposal site rather than the concentrations of radioactive material in various disposal waste packages.

Impacts are assessed by considering radioactive material carried typically by water to a human receptor. Where in the disposal site the water came from is no longer a factor once it leaves the disposal site. Next slide, please.

I'd like to offer a couple areas where I think greater risk informing the low-level waste management scheme would help. A greater emphasis on the risk informed case specific approaches to low-level waste management would be a

good start.

A second would be to shift the focus to the inventory of radioactive materials being managed rather than focus on the origins of the radioactive materials or the concentrations in various small portions of the waste to be disposed. Next slide, please.

Let me give two specific examples where these approaches would be helpful. Extended storage of Class B and C waste would require perhaps a greater emphasis on the surface processes like extremes in weather to properly manage materials that are in storage for longer periods of time. Robust containment might be another.

The use of Subtitle C and D landfills for disposal of certain types of low-level radioactive waste have already been accomplished. A systematic and regular risk informed approach for such disposals would, I believe, make for a sound technical process that is more transparent to all interested stakeholders. Next slide, please.

These approaches I'm suggesting today have already been used for waste determinations at the Savannah River site and the Idaho National Engineering Laboratory. The NRC is fortunate to have in my view a most skilled performance assessment team of experts that accomplish this work.

The tools and techniques they have developed are in my view an excellent foundation for building a more comprehensive risk informed approach for a wider array of low-level radioactive waste management challenges. Next slide, please.

As in these two examples a risk informed approach for performance assessment could be developed for a wide array of disposal scenarios that account for the following items: Waste forums, waste packages, disposal technologies used below grade such structures or other confinements systems, the cover technology for redirecting surface water, and the geo-hydrological and the geological features for any given site.

From these considerations appropriate waste disposal criteria could be developed on a case by case basis. In my view, this could be an improvement over the use of results from a generic grounding case model trying to account for all variables over a wide range of values. I think it would be very -- next slide, please; I'm sorry.

I think it would be useful to offer the low-level radioactive waste management community an alternative method that specifies the tools and techniques necessary to perform an appropriate site specific or risk informed performance assessment based on the case specific features I mentioned earlier. From such an analysis the case specific disposal criteria could be derived.

The current concentration tables in 10 CFR 61.55 were derived from conservative bounding analysis approach and can still serve as a reference case for low-level radioactive disposal. A site specific risk informed performance assessment; however, will in my view offer improved techniques for evaluating new and emerging low-level radioactive waste management.

Thank you for your attention. I'm happy to take any questions.

MR. VIRGILIO: Thank you, Mike. That completes the staff's presentation. We're now ready to take questions.

CHAIRMAN KLEIN: Well, thank all of you for a very broad discussion of the low-level waste areas. I'm sure it won't surprise you that we have some questions and we'll start with Commissioner Lyons.

COMMISSIONER LYONS: Let me start by echoing the Chairman's comments. Certainly, a very interesting, very broad reaching set of presentations this morning. Thank you very much.

I do have several questions and some of them -- I'll start with some fairly general ones and maybe the first one for you, Larry, or maybe others would like to jump in, too.

Larry, you emphasized that based on current guidance we're in a maintenance mode for low-level waste issues. At the same time we've heard quite a number of presentations already and we're going to hear a lot more before the day is over that may suggest it's about time to get out of a maintenance mode.

What's your views on if the days of the maintenance mode are limited and if we need to be cranking up our activities? I'd appreciate other comments, too, of Marty and maybe others.

MR. CAMPER: Well, thank you, Commissioner for the question. Clearly, it's something that we have thought a lot about over the last several years. The amount of work and the interest that is shown in the program clearly exceeds the level of which we are staffed. There is no question about that.

We provide a lot of support also in terms of preparing for dealing with issues at the IAEA because what goes on over there can influence what happens here.

Certainly, I could certainly use more resources in that area, if you would, to answer the question directly. I think as time marches on conditions have changed since they were when the Commission made a consideration in 1997 to stay in a maintenance mode.

The Class B/C storage, the long-term solution to that problem probably dictates that we take a bit more of an active role and things about low-level waste. So, I guess in some I would say I think we probably do need to do a bit more than we've been doing.

COMMISSIONER LYONS: Marty or others do you want to comment? Okay. A related question. I was hoping that perhaps Marty and Larry and Mike and maybe others would comment.

There's been a number of references to the Act as you defined it and there have been a number of suggestions over the years that the NRC should take a more active role in suggesting legislative changes or that Congress should perhaps review that Act.

I'd appreciate any comments from at least the three of you and anyone else who would like to comment on your views on are we getting close to the day when we do need to ask Congress to relook at that Act. Certainly, with all the ramifications and implications and concerns that several of you highlighted in your

presentations, I'm well aware this isn't simple.

MR. CAMPER: Well, I'll go first. Any time we talk about over the years trying to do something about the Act you always come back to the question of okay, what specifically would you recommend be changed? Will you get the outcome that you went to Congress for? Will it be better at the end then what you have today? And the answer is, of course, you don't know.

What you try to do would be to identify the problems that have emerged. Historically, certain Commissioners even previous Chairmen have spoken about the problems with the Act, but certainly as an organization, as an agency, we have not gone there. Then there will be those who will say, "Is it really broken?"

For example, the licensing or the near-term licensing at WCS indicates that there is an infrastructure under the Act that can allow for the licensing of a low-level waste disposal facility. Is there enough waste volume to support more low-level waste disposal facilities? The slide that I showed demonstrated a dramatic drop.

Now, the Commission in 1981 put out a policy statement calling for volume reduction in waste. The industry responded. And so, I think certainly in my mind there's an economic question as to whether or not more sites could be economically viable.

So, I think if you were to do that, Commissioner, you'd really have to stop and do a good analysis and say what are the particular problems or issues we would want to focus upon and identify very carefully crafted language. But again,

we don't know what the outcome would be.

DR. RYAN: I'll take a crack at that, Commissioner Lyons.

COMMISSIONER LYONS: I know, Mike, from ACNW you've considered this in your work.

DR. RYAN: We have. I think the two examples I cited are the Savannah River site waste determination and the Idaho waste determination are two very complex cases that the staff was very successful in analyzing with modern tools.

So, before taking the step of going to Congress I think there's a little homework to do and that is to improve the techniques and tools that are available for these kinds of analyses. I think one difficulty that we have is trying to explain how the EIS worked in a bounding analysis, where by the way you have to garden in irradiated hardware. That's one of the assumptions of the intruder scenario. That it's very difficult to get across what the real risks are when you've used extreme circumstances to analyze a limit.

So, if we took a risk informed view and improved our tools and techniques and did a better job I would hope -- and, of course, I couldn't guarantee it -- but I would hope that we could better communicate with all stakeholders on what the outcomes more realistically might be.

And in fact, we can do a better job of analyzing a wider array of circumstances and conditions at various sites for various wastes and the various disposal scenarios. I think it might become a little bit better; maybe not easier, but

certainly more transparent.

MR. VIRGILIO: I would just like to leverage off of Dan Collins' remarks and say that while there may be economic reasons why one might want to go there, we still have not seen a health and safety reason for us to initiate some legislative changes. So, every year as Karen's call comes out for are there legislative changes we want to propose, I pick up my pen and then I put it back down again because of what Dan has said. We really don't see the health and safety issues yet. It could happen, but it's not there yet.

COMMISSIONER LYONS: I appreciate that comment. Just as a quick response -- I'm over time, though. This is something where we do need to anticipate because if we ever chose to request changes to Congress it ain't going to happen overnight. It will be a very, very lengthy process.

So, while I appreciate that we don't have -- that we are not seeing the problem we also need to take a forward-looking view and anticipate. I think that's implicit in several of your comments. I hope we have time for another round.

MR. PANGBURN: George Pangburn, FSME. I think building on what you're saying, Commissioner, you're going to hear from the states this afternoon about some of the issues that they're seeing at their sites. And while Dan alluded to the fact that we have not seen significant problems at our licensees the states have four to five times as many licensees as the NRC at this point.

I think the question becomes one of really do we -- as you suggest -- anticipate or do we wait? At this point we're not seeing it, but there are isolated

cases out there where licensees for economic or other reasons may not be choosing to follow their regulatory responsibilities.

We have a strong program, both ours and the Agreement States, to assure that they do do that. But in the current economic situation where we have both a lack of disposal access and economic situations that may drive people to say this license is no longer a thing of value to me, I'm going out of business, and either chain up their facility or simply walk away. There have been isolated cases of this.

It's a challenge to us as a regulator when that license is not a thing of value to us. So, I think it's something we need to be considering as to what our posture should be.

COMMISSIONER LYONS: Thank you and I certainly plan to ask a similar question this afternoon, too.

CHAIRMAN KLEIN: Commissioner Svinicki?

COMMISSIONER SVINICKI: Thank you. I think I'm in a bit of a listening mode today. My experiences with low-level waste policy is really viewed through the framework of more of the public policy debate on Capitol Hill. And as you think more and learn more about low-level waste one is tempted to say perhaps that the U.S. high-level waste policy is positively rational in comparison.

But I think we agree that certainly although maybe we don't want to categorize it as broken, as Larry said, it is I think many -- from what I'm hearing today -- many people would say that it's not as risk informed as it could be. It is not optimized in the sense of truly risk informed and performance based.

But whatever system, no matter how imperfect, is always between generators and disposers, we're going to arrive at some sort of stasis point as people work with the system; so between statute and regulation and guidance and then just operational practices, the system always finds its own balance point.

So, then when you contemplate going in there and interrupting any aspect of that, of course, you have the interests as they've grown up over time. So, it's technically challenging. We do have the usual entrenched positions on things.

So, it's tough and I'm sitting here and Dr. Ryan is -- I guess I'll pick on you a little bit only because you have followed these policies over the years, but also in your capacity today you stand a little bit off to the side. You're not like the other folks here who are actively regulating this day to day. You've talked about approaches for improvements. Larry's got the rulemakings that are near and midterm that he's talking about.

Dr. Ryan, if you were to step way back and say kind of where do we start if we wanted to step into this whole system and if there was something where in the near term it would be the most benefit to perhaps try to tweak or improve and this could be statutory or regulatory.

The interesting thing you've talked about performance assessments and for those of us who work in this community depending on what our background is have more or less of a comfort level with that, but when the public is used to something where there are a lot of tables and numbers and a prescriptive type of regulation their reaction sometimes to saying, "Well, we're going to do a lot of

modeling and do an in-depth performance assessment," I think that sometimes that's hard to communicate that that is taking into consideration the kinds of things that the tables did and maybe in a more site specific manner.

So, I guess that's a long statement, but if anyone would like to chime in on any of that and I would like to hear your perspectives, Dr. Ryan.

DR. RYAN: Sure. I can give you cases where performance assessments have failed and some have succeeded. The two cases I mentioned are, I think, the best examples of a very improved technique for a transparent performance assessment. It's a complex calculation, but it can be laid out very simply.

If people want to look at this parameter, I don't think it's that high or that low, it's simple to change and simple to evaluate with the tools that are now currently available. So, those two successes are very complicated waste disposal circumstances, wastes that have been around for decades in tanks and so forth and so on. So, they've been successfully done.

It's much harder to try and explain to somebody how the resident intruder at year 100 plus zero days digs into Class C waste and grows all his food and stuff he digs up out of the disposal cell. It's not a realistic scenario, so that's a much harder thing to communicate because it doesn't pass the laugh test.

Its abounding analysis that I think as we've learned and recognize that these really don't communicate risk and they don't necessarily give you the bound of risk. They in fact can mask risks. If you accept those as the right answers you

might miss something that's much more important as we've learned on the reactor side of the house.

So, I think the strategy I would use is to try and improve the tools, make them risk informed, and give the users a clear picture of a realistic yet conservative risk informed assessment that can then be the basis for better communication.

COMMISSIONER SVINICKI: And so, that's the kind of homework that you were referring to to Commissioner Lyons of doing that type of work and having those communication strategies laid out?

DR. RYAN: Yes. And I believe the two examples of what the staff has already done with the Idaho National Laboratory and the Savannah River waste determinations those are two success stories. And, of course, they're working on other avenues and other projects in that area and I think that would be where I would try to mine at least some of these approaches in a path forward.

COMMISSIONER SVINICKI: Thank you. Larry, just to be a little more crisp in my question in terms of near-term activities that you covered I know that the staff will always respond to whatever the Commission's direction is. And so, we do a bit of an ad hoc prioritization as we issue our staff requirements over the course of a year.

But in looking at it year by year do you think that we're focused on the right near and midterm activities in terms of incorporating more risk informed approach to these issues?

MR. CAMPER: I do. We have two rulemakings before us at this point. Of course, the work on depleted uranium to put together a requirement for a site specific risk assessment -- performance assessment I should say. I think the great value in that is that it will normalize, if you will, it will cause all performance assessments by regulatory requirement to contain the same technical parameters.

The states that operate the low-level waste facilities have done performance assessments for disposal of depleted uranium, but the value of that particular approach is that it will normalize, all technical parameters will be evaluated the same.

Similarly, you've directed us to pursue risk informing the waste classification scheme. I think that, frankly, is long overdue in my view. I think that initiative will generate a great deal of interest. You're right, Commissioner, a huge amount of cottage industry and strongly held views have grown up around our system.

The system works. It's not broken. It does work, but it was created a long time ago. Disposal techniques have changed. What we know from our operating experience is profound. It is time to take a good look at the waste classification scheme.

COMMISSIONER SVINICKI: And it's also grown up by accretion, so you tack on things as issues arise. And that's generally not an optimum system when you've been accreting new requirements.

MR. CAMPER: I think the answer to your question is you've given us direction which is right on at this moment in time. I think there are some

challenges as we look down the road, though, that do concern me in all candor.

If the B/C storage problem continues at some point I think we're going to have to stop and take a closer look at that. Do we know just how much is being stored on site and where? Is that something as a regulatory body we should know? That's maybe something we'll have to look at as this continues. I foresee it continuing for the near-term future certainly.

The sealed source issue. You're going to hear a lot this afternoon, but there's an awful lot going on right now in the Agency and with the staff on sealed sources. There are several things that are going on, so we certainly -- while as Dan points out we've not seen some of the problems that the states have seen yet, but they have a lot more licensees.

And so, we're listening very closely there and we'll work closely with the states. But that's an area whether it be perhaps modifications to financial assurance, perhaps the use of surcharges to ensure that these sources are disposed of properly down the road. Those are things that we'll probably come to talk to the Commission about more as we move along.

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

CHAIRMAN KLEIN: Well, I normally start my questions in order of the presenters, but my first question will cover the first and the last.

So, in terms of the risk informed performance based I think that's an area that we've learned a lot in the reactor area that we're just now looking at the tools to apply to the low-level waste area.

And I guess for both Larry and Mike, do you see any major stumbling blocks to go towards a risk informed performance based in low-level waste?

MR. CAMPER: I don't see a stumbling block technically. As Mike pointed out in his comments ICRP-2 was used. There have been many revisions to ICRP methodology since then. In the health physics arena, continuing progress on organ weighting factors. Health physics is not the same as it was in 1981.

I don't see a technical problem and we certainly have the staff and the capabilities and I appreciate Dr. Ryan's comment on our performance assessment group. They're very talented. So, I don't see a technical problem, but I think once you move into changing the waste classification to risk informed it will generate substantial interest in the public.

Some folks will look at risk informing as code for deregulating. They will have concerns in that regard. Some folks have become very accustomed to the system that you have today and the current waste classification system, which is not the only system. The IAEA uses a totally different system; similar, and yet markedly dissimilar.

So, I think the point is is that there will be a great deal of stakeholder interest and we'll have to have one or more workshops to fully ferret out those views, consider them, factor them in. But from a technical standpoint or from a capability standpoint, no, I really don't. We can do it.

CHAIRMAN KLEIN: Mike?

DR. RYAN: I'd agree with Larry's last statement. I think the staff is

as best qualified as any group of folks to do this kind of work. I think the challenges -- and I'll give a different cast to it than Larry did -- is that it's very difficult to communicate with somebody about what a concentration risk is versus what a quantity risk is.

I could have a Strontium 90 source used in ophthalmology and put it in a plastic cup and keep it in my pocket, but it's thousands of times higher in concentration than Class C. So, the risk is not always expressed best in the concentration table. It might be the quantity and the concentration under some consideration of the circumstances where you find the material. So, that's the key challenge.

I think what we have to do is move forward with not only the technical processes and calculational techniques and all of that that have already been used a couple of times, but figure out how to communicate how they work and why we're taking a count of concentration and quantity in the way we will do that in order to properly assess the range of risks that we're trying to understand.

Don't forget we're also protecting workers as well as thinking about once disposed. Even the old definitions -- we used to have contact and noncontact waste. That's strictly a health physics requirement, but they were buried in different ways because of what they contained. But they were still called contact and noncontact waste.

So, we're trying to set down some of those old conventions that were based on very early concepts of protection both for workers and the environment and

have that evolve into more risk informed performance based assessment, one for workplace questions, worker questions, and then second for the disposal environment once disposed. I think we can do it.

CHAIRMAN KLEIN: Sort of a follow-up question for both of you again and you both made little comments about it -- the international community. What's your assessment of where they're headed? Are they watching us? Do they feel comfortable with where they are?

MR. CAMPER: Well, let me speak to the IAEA in particular. The IAEA is now finalizing a new guidance document on waste classification. It contains five categories of low-level waste and, of course, high-level waste for a total of six categories.

As Jim pointed out in his remarks the clear demarcation between class of waste is not as crisp as is our process and they even acknowledge that in their document indicating that it's not always easy to tell what that clear line is. But it's a bit more qualitative.

As I said there are five categories. You have, I think, very low-level, very short-lived, low-level waste, intermediate-level waste and so forth. So, certainly, they're not using our process and they're not waiting on us. They're creating their own updated waste classification approach.

The other thing they do is in their document they point out -- I think they say in essence that if a country has more than one waste disposal facility, then site specific conditions should be strongly considered because not all waste disposal

sites are created the same of course. So, they're moving in that way. They're not waiting on us.

We commented extensively on that document when it was being developed. A lot of waste is being stored abroad waiting for some disposal pathway to come along. So, they're making a lot of progress, different approach and they're not waiting on us.

CHAIRMAN KLEIN: What's your sense, Mike?

DR. RYAN: I think in some ways other countries may even be leading us. France has a very mature radioactive waste disposal system at the Centre de l'Aube. They have, I think, done a very good job of looking at the inventory type of concept as the final metric for the site itself and, of course, they have the operational concerns while they're using it.

The ACNW visited the Japanese program a few years ago. They now have low and intermediate waste sites that are up and running. So, I think they're along the balance between concentration and quantity. They certainly have worker protection programs and they certainly have long-term performance assessments for their facility. So, I think in some ways we might be a step or two behind.

But again I think the path forward of how to improve our system and make it transparent is there for us to take and use and their examples will be helpful.

CHAIRMAN KLEIN: Thanks. Commissioner Jaczko?

COMMISSIONER JACZKO: Well, I guess we'd focus this on risk informing Part 61, which I think is an interesting discussion. We perhaps could

have an entire meeting just focused on that and perhaps that's what this meeting will become.

Whenever I think about risk informing Part 61 -- and I did support in the SRM efforts to do that. But as I think about it more I'm reminded of something when I was in, I think, elementary school.

When I was in elementary school we learned all about the metric system. We learned about the metric system because it was better. To this day, I'll be honest, I don't know how many cups are in a quart or how many -- you can go from teaspoons to gallons and there's some conversion. I don't know what they are. I know how milliliters there are in a liter.

That was what -- we learned speed limits. We learned everything. We were going to do kilometers. That was the wave of the future because it was a better system. It was clearer and we never did it. We still use miles. We still use gallons because we have an infrastructure and a system that's built around that.

So while -- I think to some extent this discussion is very theoretical and as such it's very simple to say this is the right thing to do. But from a practical standpoint we have waste that has been disposed of in Class A facilities. We of waste that's been disposed of in Class B facilities. We have waste that's been disposed of in Class C facilities. So, all of those things are out there.

The issue -- and I think I'd go back, I think as the Chairman said start at the beginning and the end -- the issue that we face right now -- and I think, Larry, you hit on this. It was one of your key messages. There is adequate disposal

capacity, but some lack of disposal access.

Risk informing Part 61 will not address that issue. So, that is the challenge and the problem we face. Commissioner Lyons asked the question about whether or not we should change the low-level waste compact acts. And Mike talked about it and I think what Mike was talking about was changes to how we classify waste that might be embedded in statute. That's a very different issue, I think, than what Commissioner Lyons was talking about.

I think the challenge is with the Low-Level Waste Compact Act right now have to do with siting. States do not want to site facilities. Risk informing Part 61 is not going to change that dynamic. So, I think we have to just keep in mind what the problems are that we're solving.

I think to some extent, I think, the staff understood this when they did the strategic assessment. They did look at these issues and one of the activities they looked at was revising Part 61 to be more risk informed and at that time they gave that a low priority.

And I'll just read from that. They said the impacts on strategic goals. This is the tasks in Part 61. "This task would not significantly affect safety and security benefits. Although it is difficult to predict all of the benefits that might result, some might include the potential for facilitating future licensing of low-level waste sites by eliminating some current requirements and eliminating unnecessary conservatism, and thereby facilitating disposal of more types of waste."

I don't think that gets to the challenges we have right now in siting disposal

facilities. So, that one benefit is not really addressing the problems that we have. At the time the staff said it was a low ranking. Again, I don't necessarily think that there isn't a challenge to -- that there isn't a reason to try and look and improve our methodologies.

There will always be scenarios. There will always be ways. If we're going to do a dose based standard we have to determine how people get the dose. So, you get back into scenarios where you have to determine uptake.

Well, what is to one person reasonable is to another person unreasonable. That is inherently a policy question. It's not a technical question that will be easily resolved with any kind of updated computer modeling.

And that's where the challenges are right now and the challenges we talked about with the existing classification system have to do with how we determined the acceptable concentrations, which was based on a certain set of intruder scenarios and other types of exposure pathways.

Those same challenges will be there when we try to risk inform Part 61 because we have to figure out, again, if it's a dose based standard, how are you getting the dose? What are your assumptions about what an individual may do in order to obtain a dose? And, of course, we've done this in high-level waste. We have that kind of discussion and those discussions are as I said not as technical as they could be.

So, I don't really have a question there. I just think as we do this let's keep in mind what the real problem is here. The real problem is siting. It's not

necessarily technical issues with the classification.

I do have a question I want to get to and this goes back to Jim, one of the issues brought up and that is on low activity waste. In your slide you mentioned that the volume of low activity waste is comparable to the volume of Class A waste.

I don't think what you were intimating was that we are disposing of an equivalent volume of Class A waste in non A-licensed facilities, unless I'm wrong. We've had a very, very limited number of exemptions under 2002 and I don't even think in the last couple of years we done any, have we?

MR. KENNEDY: No, we haven't, but --

COMMISSIONER JACZKO: Maybe I was wrong. That was what you were saying. That was news to me. I wasn't aware that we had disposed of that much material under 20-2002.

MR. KENNEDY: Some of this gets into definitions because low activity waste it's not defined as you know first off. It is typically at the very low end of Class A waste. It's at clearance levels; clearance as defined by IAEA, the concentration limits that they have for clearance and releasing material for unrestricted use.

Some of the materials actually are not radioactive at all and it still comes from a nuclear facility, so it's called low activity waste. But with respect to 20-2002 we haven't done any -- I don't think -- maybe we did one in the past year, Aberdeen Proving Ground.

The majority of the waste I believe is unimportant quantities of source material, exempt source material less than .05 weight percent uranium and thorium that's been disposed of at RCRA facilities, hazardous waste facilities and that we're terming low activity waste becomes it comes from a nuclear facility.

COMMISSIONER JACZKO: Okay. So, it's not material?

MR. KENNEDY: It's not 20-2002. We have a different policy for releasing -- approving unimportant quantity disposals. It doesn't have to occur under 20-2002 because the materials are already exempt.

COMMISSIONER JACZKO: Essentially, the other big class then would be as you said it's the exempt quantities under various parts of Part 61 as well as the exempt quantities, then, for uranium and thorium.

MR. KENNEDY: Correct.

COMMISSIONER JACZKO: Okay. Thank you.

CHAIRMAN KLEIN: Commissioner Lyons?

COMMISSIONER LYONS: Dan, in your comments you mentioned one licensee in Puerto Rico that had actually I think shut down based on some of the issues we're discussing today. I'm curious if you know or maybe any of the other panel members know of other examples where storage or disposal issues have caused a licensee to shut down operations?

And what I'm most interested in is whether we're aware of any cases where such a shutdown has impacted, particularly medical research, but perhaps research in general, research that could be leading to improvements in quality of

life.

Are you aware of any others besides the Puerto Rico example, and if anyone else wants to add?

MR. COLLINS: First off, just to clarify, Commissioner. The example in Puerto Rico that I cited the facility shut down not because of the disposal problems itself or lack of access to disposal, but it's just after the facility was decommissioned they had the remaining material left over and they didn't have the disposal access at that point. So, if I misspoke that, I apologize.

But to answer your question directly I'm not aware of any other facilities that have been forced to cease operations or shut down because of waste disposal issues specifically.

COMMISSIONER LYONS: Well, thank you for the response. This is a question that I'll also address to some of the folks in the afternoon just to see if there's any other points of view, but I do appreciate that.

A question -- I'll start with Larry, but this is another one I'm going to ask at least Mike Blevins in the afternoon. One of your slides, Larry, which was slide 8, showed the, I'd say, spectacular decrease in low-level waste generated. Your example was for PWR's. I'm just curious -- and again I'll ask Mike this afternoon, too.

I'm aware of some of the ways that the reactor sites in their operations have dramatically reduced low-level waste. I'm sure I'm not aware of all the techniques they've used.

But my specific question would be if we are aware of any safety significance of the changes that have been made in reactor operations in order to reduce that waste?

In other words, is there any tendency for a compromise in safety as the reactors have dramatically reduced that waste or is it strictly improved operational techniques? If it's not fair to ask you, I'll ask Mike this afternoon.

MR. GARRY: I can address that. From the Division of Inspection and Regional Support I don't think it has at all. I think it's primarily driven by economics. If you take a look at the inverse curve of that of the cost per cubic foot of disposal it goes up. So, it's primarily been driven by economics.

The practical aspects of reducing the waste is simply training of workers on what kind of radioactive materials or nonradioactive materials to take into a contaminated area and methods of processing and removing their clothing, methods of filter disposal and optimizing and none of that has safety significance with respect to operational or occupational safety.

COMMISSIONER LYONS: I appreciate that answer, Steve. I just wanted for the record to get into this question of whether there was any compromise in safety from any perspective as we saw this dramatic reduction. I'll ask Mike the same thing this afternoon, too, just for a perspective from industry. Those are my questions, sir. Thanks.

CHAIRMAN KLEIN: Commissioners Svinicki?

COMMISSIONER SVINICKI: I don't have anything further.

CHAIRMAN KLEIN: Well, I've got a couple of questions for Steve. You talked about Greater Than Class C. Where is it going?

MR. GARRY: Right now, most of the Greater Than Class C waste is associated with decommissioning; the reactor internals and so forth. So, for operating power plants, which is what I'm representing the Regulatory Commission as, there's very little Class C generated.

There's some in core detectors that are stored in the bottom of the spent fuel pools. There's some stored in on-site storage casks along with ISFSIs, but there's actually very little volume of Greater Than Class C for an operating power plant.

CHAIRMAN KLEIN: Are there any others that are Greater Than Class C from non-power sources?

MR. GARRY: That's outside of my area. We'll have to ask maybe Materials. I'm not aware of it other than sealed sources possibly. But I'm not the expert at that.

CHAIRMAN KLEIN: On the sealed sources, Dan, when you were talking about those, are those currently being stored? A lot of the sealed sources?

MR. COLLINS: Yes. If they're at the licensee's facilities they're stored under appropriate security provisions.

CHAIRMAN KLEIN: I know that NNSA has a large program of getting a lot of the sealed sources back. And so, are they just storing those at the present time?

MR. COLLINS: They're storing them until -- many licensees have registered their unwanted sources with the offsite source recovery project. And until these sources are collected through that process or through the state's process, the SCATR program, they are storing them on site.

MR. CAMPER: Chairman, let me put the GTCC in perspective, if I could. According to a July 2007 Sandia National Lab report there is 58 cubic meters of GTCC stored today in the reactor fleets from decommissioning. An additional 813 cubic meters is projected by 2062 post-decommissioning of the fleet resulting in 871 cubic meters by 2062. So, there's not a lot of it.

CHAIRMAN KLEIN: Thanks. This may be a question more appropriately, Steve, for the afternoon session from our friends from Texas, but you'd commented that WCS is storing a lot of material from Studsvik.

MR. GARRY: They're beginning to. They haven't -- this month will be their first shipment from Studsvik to Waste Control Specialists, so there's not a lot in storage yet.

CHAIRMAN KLEIN: Is that from their Tennessee facility?

MR. GARRY: Yes.

CHAIRMAN KLEIN: And I didn't realize Tennessee was part of the Texas Compact. How does that work?

MR. GARRY: No, they're not part of the Texas Compact. That's why they're only storing the waste. They're not disposing of the waste.

CHAIRMAN KLEIN: Thanks. Commissioner Jaczko?

COMMISSIONER JACZKO: I just have one question. This is on the EPRI report. I guess perhaps we could clarify a little bit for me -- and again, I'll have to ask the staff because I actually won't be here this afternoon and I apologize for that. So, I'll have to ask the staff their understanding of the report rather than be able to ask NEI directly.

In particular the issue and the two that I think Larry you touched on the staff did not comment on. One was the blending and then one was the up concentrating -- I don't know if we have a term for that; the B and C, to Greater Than Class C.

What is the staff's understanding right now of how -- Jim, maybe you touched on it. I'm not sure if you're the one who had touched on it or who had touched on it -- indicated that at this time licensees don't have any plans to -- I guess they would keep the resins in longer so that they would get to a Greater Than Class C level. Licensees don't have any plans to do that.

But as far as this guidance that was developed for licensees did the guidance suggest that that was a strategy they could use? How did it reflect that?

MR. GARRY: They noted it was technologically achievable. Basically what they're doing there is removing the nonradioactive components of the waste and that essentially concentrates what is there. It goes back to Dr. Ryan's comments about concentrations and quantity.

COMMISSIONER JACZKO: So, it wouldn't be keeping the resins in longer. They'd change them out at the same time and then they'd process?

MR. GARRY: Right. That's what Studsvik do. They essentially process it by thermally removing the hydrocarbons out of the waste, which are the nonradioactive components.

COMMISSIONER JACZKO: That would change it to Greater Than Class C in some case?

MR. GARRY: No. Well, from what they anticipate doing it will keep it as Class B and C. It will be higher concentrations of Class B and C, but it will still be Class B and C.

COMMISSIONER JACZKO: I guess I thought there was a recommendation specifically where they were suggesting that some B and C be concentrated higher so that it would be considered Greater Than Class C.

MR. GARRY: They were just saying that technologically Studsvik or some other processor could do that; not that that's their business plan.

COMMISSIONER JACZKO: It wasn't a strategy they were recommending?

MR. GARRY: No. Not their business plan.

MR. CAMPER: Let me clarify in defense of NEI and EPRI if I might. Just based on discussions we have with them they did say that this could be technologically feasible. They did point out that this is a concept. It's not something they have any intention of pursuing actively.

I think what drove them to some degree, almost jokingly if you will, was the notion that we may have GTCC storage disposal capacity before we have B/C

capacity and therefore it's a concept that's technologically feasible, but they have no intention of pursuing it as we understand at this point in time.

And it is something, obviously, as we are looking at this blending issue is something we would keep a close eye on and communicate with the Commission about it because it does have implications.

COMMISSIONER JACZKO: Thank you.

CHAIRMAN KLEIN: Well, thank all of you for a great presentation; a very broad subject of which there's certainly a lot of interest.

Now, we will bring up our DOE and NNSA colleagues.

PANEL 2

CHAIRMAN KLEIN: Obviously, you heard a lot of discussion on low-level waste. A lot of that impacts DOE and NNSA as well. And so, Frank, we'll begin with you.

MR. MARCINOWSKI: Thank you, Mr. Chairman, Commissioners. Thank you for having me here today and I'm going to give a little presentation about DOE's Environmental Management Program and our waste operations and focus specifically on Greater Than Class C as has been mentioned earlier. Next slide, please.

Although the low-level waste generated by the Department of Energy is similar to the waste generated by NRC and Agreement State licensees there are

some important distinctions about DOE I would like to highlight.

First, DOE is self regulating under the Atomic Energy Act. As such, our radioactive waste management activities are governed by DOE order, specifically No. 435, the Radwaste Management Order, not by NRC regulation.

Additionally, DOE emissions programs have historically generated much greater volumes of low-level waste and mixed low-level wastes through its mission programs and through the clean up activities conducted by the Office of Environmental Management.

The DOE order establishes the framework or the policy framework by which DOE manages its waste. That is that waste is first looked to be disposed of on site where it is generated if that's practical. If that is not, then we look secondarily at another DOE site for disposal.

And lastly, commercial disposal options, if we can be compliant, if it's cost-effective, and in the best interest of the government to do so.

It is important to note that DOE Order 435 also defines the framework for the development and management of DOE disposal facilities. These responsibilities rest within my specific office.

We have a group which is called the Low-Level Waste Federal Facility Review Group, which oversees establishment, siting and operations of DOE low-level waste disposal facilities. The facility specific waste acceptance criteria are based upon performance assessments and composite analyses that are developed for each facility establishing the performance envelope for that

particular facility.

These performance assessments differ from the disposal licenses governing commercial disposal facilities in that the department looks at radionuclides and concentrations in the modeling of disposal facility performance and not just Tables 1 and 2 of the radionuclides and concentrations in 10 CFR 61. Next slide, please.

In the last two decades the majority of low-level and mixed low-level waste in the U.S. has been generated by DOE activities. These wastes include disposal in both DOE and commercial facilities.

Just to put it in perspective 88% of the waste that was disposed between 1990 and 2008 was DOE generated. This equates to 9.6 million cubic meters of DOE waste that was generated and disposed at either a DOE or commercial facility. This is in contrast to the 1.3 million cubic meters that was licensee generated waste.

Although in volume terms most DOE waste is generated by facility decommissioning and site cleanup activities there is also some newly generated waste that is also included in that estimate.

Of the 9.6 million cubic meters of waste disposed between 1990 and 2008 70% was disposed of on site where it was generated, 10% was disposed at other DOE sites, and approximately 20% was disposed at commercial facilities.

It is important to note that in this timeframe this included the completion of three very large remediation projects, in particular the Rocky Flats, Mound and

Fernald sites, which generated large volumes of waste which were shipped to commercial disposal as well as DOE.

DOE's annual disposal volumes currently reflect a slightly lower use of commercial disposal, and as Larry mentioned earlier that's because just generally the volumes of waste have declined over the years because of the completion of some major cleanup activities.

For example, in 2008 alone we generated a half million cubic meters of mixed low-level and low-level waste; 77% of that was disposed on site in CERCLA facilities; 12% in DOE non-CERCLA facilities; and 11% went to commercial disposal. Next slide, please.

DOE updates its life cycle forecast annually and makes the information publicly available in our waste information management system. We estimate that nearly 2.2 million cubic meters will be generated between 2009 and 2015. Again, the proportion of disposal about 77% will be disposed of on site, about 5% will go to Nevada test site and we estimate about 6% will go to commercial disposal.

There's a small percentage that has yet to be defined as its disposal path due to characterization that needs to be remained; however, I do want to note that the newly passed Recovery Act and the monies that DOE has received as a part of that will significantly increase our waste volumes in the next couple of years and we're still assessing exactly how much of an increase that will result in. Of course, they will change those estimates.

We have some uncertainties about future disposal capacities for DOE

waste, particularly in the area of higher activity mixed low-level waste. We currently utilize our mixed low-level waste cell at the Nevada test site for this activity. That is under a closure license right now with the State of Nevada, which must be closed by December of 2010. So, right now there is no disposal option that exists beyond that.

We are exploring a new mixed low-level waste cell that would be constructed within the Nevada test site. We are also looking at commercial possibilities as well. Next slide, please.

The Low-Level Waste Policy Act assigns DOE certain responsibilities. And quickly, we have a strong relationship with states and regions and we are very interested in the issues related to commercial low-level waste disposal since we utilize that for a significant volume of our waste. Next slide, please.

Moving on to the Greater Than Class C. DOE has a statutory responsibility to provide disposal for Greater Than Class C low-level waste. We're preparing an EIS for this purpose and it would include both the Greater Than Class C low-level waste as defined by the NRC, as well as what we're qualifying as Greater Than Class C-like waste, which is DOE generated waste with similar characteristics without a defined disposal path right now.

The EIS scope right now includes 11,000 cubic meters of waste that's stored or projected. About two-thirds of this waste would come from the commercial sector and about a third of that would be from DOE activities. This estimate is an increase over what was published in the Notice of Intent from July

of 2007 and it reflects a refined understanding of the current and to-be-generated waste. Next slide, please.

Just to provide a summary of where we are in the process of this particular EIS. Current statue requires that this Greater Than Class C disposal facility be licensed by the NRC. NRC regulations indicate that Greater Than Class C waste are generally not suitable for near surface disposal; meaning geologic disposal is likely required to achieve permanent isolation; however, the NRC regulations provide for evaluation of alternative disposal methods.

Our EIS is evaluating a range of these disposal alternatives. In particular, deep geologic disposal at either the Waste Isolation Pilot Plant or the proposed Yucca Mountain facility; enhanced near surface disposal at Hanford, Idaho, Los Alamos Lab, Nevada test site, Oak Ridge, Savannah River site, and the vicinity of WIPP or commercial locations.

And also intermediate deep borehole locations at those same locations except for Savannah River and Oak Ridge.

The preliminary draft has been complete. It's undergoing internal review. EPA as a cooperating agency is participating in this review. As an accommodating agency NRC will review the draft EIS when it is published for public review and comment. It is a complex document providing both programmatic evaluation alternatives and site specific evaluations to support a siting decision.

Accordingly, it is proving more time to develop than originally forecasted.

Our current goal is to issue the draft this year and to finalize that in 2010.

Beyond issuing -- before we can issue a ROD the Energy Policy Act requires that we submit a report to Congress and we await congressional direction before we actually move forward with the actual siting of the facility. So, that's the process that needs to be completed after we finish our EIS activities.

There are significant interactions that are going on with stakeholders, with Tribes, with industry that are all taking place in this time period right now before issuing the draft. And so, we're on schedule for a draft some time later this year.

With that I'll conclude my remarks and wait for questions.

CHAIRMAN KLEIN: Thank you. Abigail?

MS. CUTHBERTSON: Thank you, Mr. Chairman and Commissioners for allowing me the opportunity to speak to you today. I wanted to note that with regard to source recovery we've worked very well with NRC staff on a range of activities from the recovery of vulnerable and orphaned sources, packaging and transportation, financial assurances and low-level waste disposal. I look forward to continuing this cooperation. Next slide.

As you probably know the mission of the Global Threat Reduction Initiative is to reduce and protect vulnerable nuclear and radiological materials located at civilian sites worldwide. The Off-Site Source Recovery Project is under the Global Threat Reduction Initiative. Next slide, please.

This slide is a brief summary of the project from the time it was managed by DOE EM through the transfer of the project to the newly formed GTRI in 2004

through its scope expansion and re-prioritization with emphasis on national security.

Las Alamos National Laboratory has been involved in this work since the project's inception. In recent years we've also worked closely with Idaho National Laboratory and CRCPD and I know Debbie Gilley will discuss CRCPD efforts later today.

I wanted to note that in our budget language it suggests that we recover as well as permanently dispose of excess radiological sources in the United States. Next slide.

This summarizes our process and our accomplishments, including the recovery of our 20,000th sealed source in December of 2008. We've recovered many sources and have many more currently registered as you'll see.

The registration process and the recovery process are in place. We're always trying to make them more accessible and more convenient for licensees and we have recently sought feedback from licensees with registered sources and have revised our registration process as a result.

We're also working to find ways to recover sources more efficiently given current disposal and packaging limitations. Next slide, please.

So, through this work we've identified three key challenges associated with sealed source disposal and these are the three.

One is the lack of commercial disposal for high activity beta/gamma sources, primarily cobalt, cesium and strontium in wide use, primarily in medical

and irradiation applications.

The second is the lack of disposal for lower activity beta/gamma sources in the 36 states without access to disposal currently.

And the third is the significant increase in foreign origin americium 241 used in the United States. That is not covered under the defense determination at WIPP. Next slide.

This is a very notional slide as is the next one. The pie charts on the left are based on the inventory of registered sources -- registered disused sources. The point here is to emphasize that sealed sources make up less than 1% of low-level waste by activity and by volume, but they're a unique security concern.

And please note also when we developed this we had thought that the limits at Barnwell and American Ecology were the same, but we've learned since then that this is not the case. So, it's a little bit different. Next two slides, I guess. Slide 8. Thank you.

So, there are currently many stakeholders involved and challenges associated with sealed source disposal. Recognizing this, the Department of Homeland Security organized a focus group in December 2008: the Focus Group on Recovery and Disposition Options for Disused Radioactive Sealed Sources. And I co-chair this with the Department of Homeland Security.

The group successes thus far include raising awareness of security concerns associated with lack of disposal for sealed sources specifically, bringing a broad spectrum of stakeholders together and better understanding the current

disposal landscape. Next slide.

These are our objectives in this group. We have developed a working problem statement, which I've included for your reference. These are the objectives we're currently investigating immediate and long-term options. I would say there a more medium-term to long-term than immediate.

The next slide is the problem statement which you can read at your leisure.

And then finally to conclude right now where we are we've put everything on the table. I very much appreciate NRC's participation in this group. We have looked at all options, the existing facilities, new facilities, commercial DOE facilities, up blending, down blending, storing for decay. And right now we're looking specifically at whether there are any additional subsets of sources that can be disposed of in the existing framework.

Disposal is important to security both as an end in and of itself because it's sustainable in a way that storage is not. And as a prerequisite for storage we found that DOE facilities, private facilities, do not want to store no disposal pathway waste. So, it's challenging for us to find temporary storage for our sources. We obviously do that and we would continue to do that even if there was more access to disposal.

We found there's no one perfect solution. All of these challenges are different. All of the disposal facilities are different. It's important to have continued Federal, state, compact and private sector engagement. We can't solve the sealed source problem on our own and we need everyone's help in addressing

these challenges. Thank you.

CHAIRMAN KLEIN: Well, thank both of you for a good background activities and we'll begin questioning with Commissioner Lyons.

COMMISSIONER LYONS: Well, certainly, my thanks to both of you for coming out. Abigail, you described a very, very important program. Certainly, my compliments on GTRI and the sealed source recovery program. Those are really, really important programs.

A question on the backlog of sources that you mentioned. Is that backlog increasing or decreasing? Are you ahead of the curve or behind the curve?

MS. CUTHBERTSON: It fluctuates. It's hard to say month-to-month. I think for a while it's been in the 8,000 to 9,000 source range. And certainly CRCPD's efforts to round up a lot of the smaller beta/gamma sources have been helpful, although they've been limited in that work to some extent by the lack of commercial disposal.

I think it's in the last year or so I don't think it has been changing. It's a mix of our ability to catch up with meeting challenges and people's awareness of the source registration process and it goes up and down a bit, but I don't think it's changed too significantly in the last year or so.

COMMISSIONER LYONS: What would be your main challenge in reducing the backlog? Is it the disposal options that you mentioned as a challenge?

MS. CUTHBERTSON: That is a significant challenge for us

currently, although I don't think it will be an ongoing challenge. We've had some difficulties identifying Type E containers because in October 1st of last year a number of those that were certified lost their certification. So, that's a temporary challenge that we'll probably face for the next year or two, but we think will be resolved after that. So, disposal is certainly probably the biggest long-term challenge associated with this.

COMMISSIONER LYONS: Thanks. And Frank, you mentioned your goal of the final EIS in 2010. Does your crystal ball say when it might be operational or when you would have an operational capability for GTCC?

MR. MARCINOWSKI: Well, the part of that process that's difficult to estimate is once we turn it over to Congress how long do we need to wait.

COMMISSIONER LYONS: I'm just curious if you had a hope or a goal or a crystal ball or something.

MR. MARCINOWSKI: Well, it also depends on what we recommend. Of course, if it's an existing facility once Congress acts then there's really very little to do in terms of development or construction of such a facility.

If it's a brand-new facility then it's going to take some time for that construction to occur. So, there's a lot of variables at this point in time and it's really hard to predict. It depends on what the ultimate decision is on recommendation to Congress, I believe.

COMMISSIONER LYONS: And then a question -- well, to show my ignorance of some of the legal basis behind what you can and can't do. What are

the legal implications or prohibitions for DOE accepting commercial B and C waste if we got to the point in the country where that was a serious enough issue?

Does that require legislative action or is that something that is within your authorizations now?

MR. MARCINOWSKI: Well, this is not a new issue and we've addressed this question in the past. We believe it is a question of statutory authority. Right now, the Low-Level Waste Policy Act provides that states and compacts have the responsibility for disposal of Class A, B and C waste.

And while the Atomic Energy Act, which gives us our authority is broadly written, I think that it may be premature to conclude that the system isn't working, particularly given the recent developments in Texas and the licensing of that facility.

So, I think we can debate about the statutory part, but right now I think the system is still working and I don't think we should conclude otherwise yet.

COMMISSIONER LYONS: Thanks for your comments.

CHAIRMAN KLEIN: Commissioner Svinicki?

COMMISSIONER SVINICKI: Thank you. Well, thank you both for being here and for your presentations. And also appreciate hearing the positive statements you made about the collaboration between NRC and DOE and NNSA. Certainly, that's something that's very much supported by the Agency, management and the Commission itself. So, I appreciate your positive statements on that.

Abigail, a little bit related to what Commissioner Lyons was covering, but a slightly different question. As I understand it for the sealed source recovery if there's an unwanted source there's an online registry where the licensee would identify that source.

Do you track a metric that would say between when that is identified and when it's picked up what kind of time period that takes?

MS. CUTHBERTSON: We don't have a metric for that. We do keep track of when the sources are registered and when they're recovered. And I could follow up and look into that.

COMMISSIONER SVINICKI: Do have a generalized sense? Would it take more than a year likely?

MS. CUTHBERTSON: It really depends on the type of the source. For instance, the large devices usually take more than a year unless it's an emergency situation where they've fallen out of regulatory control; they're an orphaned source, for instance.

Besides that, it usually takes about a year or sometimes a little more to contract for that to find the appropriate package and to do that.

COMMISSIONER SVINICKI: And somewhat I imagine your budget year to year is also a factor in terms of what recoveries you can make? Does that vary a lot?

MS. CUTHBERTSON: Our budget has been consistently increasing, so that's not the most significant problem. The issues in terms of recovering these

sources are just logistics and currently finding Type E containers and some of the contracting.

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

CHAIRMAN KLEIN: Well, Abigail on your slide 4 you listed a lot of sources that you have recovered. The number is quite large. Are all of those U.S. origin?

MS. CUTHBERTSON: Well, these are all of the sources that we've recovered domestically, so not all of the material is U.S. origin. I would think most of it probably is at this point because I think most of the sources that have become disused thus far are U.S. origin, but increasingly U.S. licensees are importing sources from abroad. And so, we do come across those and I think we'll come across more of those in the future.

CHAIRMAN KLEIN: So, have you recovered sources, though, in other countries that are not U.S. origin?

MS. CUTHBERTSON: In a very few cases when they're co-located with U.S. origin sources or very much at risk, but that's a very small exception. Generally, we only recover U.S. origin sources internationally.

CHAIRMAN KLEIN: There's pending legislation regarding importation of waste. Would that impact your program on picking up some of these sources?

MS. CUTHBERTSON: I'm not sure what the implications would be

for that legislation on our project.

CHAIRMAN KLEIN: Thanks. Frank, I noticed that the Nevada test site must have a lot of activities because you've got the mixed waste cell. Do you also have A, B and C at that site -- at the Nevada test site?

MR. MARCINOWSKI: Well, the Department does not have that classification system, but we do have low-level waste disposal cells, yes.

CHAIRMAN KLEIN: Would it be comparable to our definition of A, B and C that you're putting at the Nevada test site?

MR. MARCINOWSKI: If you lumped all those categories together, yes. We have a single waste classification for low-level.

CHAIRMAN KLEIN: Just stuff?

MR. MARCINOWSKI: Yes.

[LAUGHTER]

CHAIRMAN KLEIN: And I noticed that the borehole apparently was not an acceptable option at Savannah River site and at Oak Ridge.

MR. MARCINOWSKI: Ground water.

CHAIRMAN KLEIN: Ground water? That deep? In other words, deep borehole is still not acceptable there?

MR. MARCINOWSKI: Well, at those two sites the depth of ground water is so shallow that it would not be acceptable at those two sites.

CHAIRMAN KLEIN: Thanks. Commissioner Jaczko?

COMMISSIONER JACZKO: Frank, I had one question for you.

Maybe you can describe the process -- I don't know if there's a criteria or a process for when you do go to commercial facilities for DOE waste versus when you do dispose of it within DOE facilities, I guess.

MR. MARCINOWSKI: Sure. What needs to be done is a cost-benefit analysis so that as we weigh the options and what it would cost for us to dispose of that at an offsite DOE facility, which in this case is only the Nevada test site, versus commercial disposal.

We weigh the cost of the requirements at those sites versus the commercial and if it's a better outcome for us, for the government, then we would go commercial.

COMMISSIONER JACZKO: And you talked about the termination for the Nevada test site. That's just for the mixed waste?

MR. MARCINOWSKI: That's just the mixed low-level waste cell.

COMMISSIONER JACZKO: So, you still have low-level waste disposal there?

MR. MARCINOWSKI: Absolutely. Yes.

COMMISSIONER JACZKO: Do you foresee in the future limitations on capacity there or barring policy changes you would be able to dispose of waste there?

MR. MARCINOWSKI: The current projections for what we believe our waste stream will be we have sufficient capacity to deal with -- to handle that waste at Nevada test site.

COMMISSIONER JACZKO: Thanks.

CHAIRMAN KLEIN: Well, thanks Abigail and Frank for coming. We appreciate the information. You can tell that we obviously appreciate working together. We are from the government. We're here to help. So, thanks for your cooperation and we appreciate the cooperation of our staff for your needs.

This part of the meeting is adjourned. We will reconvene at 1:30 p.m. Thank you.

(Whereupon, meeting was adjourned.)