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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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PUBLIC MEETING TO DISCUSS

STATUS OF US NUCLEAR REGULATORY

COMMISSION MONITORING ACTIVITIES

AT THE SALTSTONE DISPOSAL

FACILITY AT SAVANNAH RIVER SITE

Thursday, January 27, 2011

Large Meeting/Conference Room

Aiken Municipal Center

215 The Alley

Aiken, South Carolina

The above-entitled hearing was conducted at 6:08 p.m.

BEFORE: Nishka Devaser, Moderator

A G E N D A

P R O C E E D I N G S

MR. DEVASER: My name is Nishka Devaser. I work for the Nuclear Regulatory Commission. The purpose of the meeting tonight -- well, it's a Category 2 meeting, NRC Category 2 meeting, which means that the members of the public are going to have specific chances to make comments and ask questions after each presentation, after -- DOE's providing two presentations, and NRC's providing one.

The purpose of the meeting of the tonight is to discuss monitoring activities at Saltstone. If I could remind everyone to sign in at the sign-in sheet at the back. In addition, should you feel inclined, there's an NRC public meeting feedback form, just how you felt about the meeting, how it was run, things like that. Feel free. We appreciate it.

In addition, at the back of the room we have agendas for the meeting. We have the -- each agency's presentations, we have a glossary of terms that we typically use, and we have a list of important documents and a means of accessing those documents.

One additional note is we're having this meeting transcribed. As a result, we -- the microphone situation is any speaker needs to stand at the podium. I know we have some mobile speakers here, so bear with me here. Sorry about that. And anyone asking a question or responding to a question needs to be at either that microphone or this microphone, and there's one at the center of the room.

So with that, I can open up to the first speaker, who's going to be George Alexander, NRC. Thank you.

MR. ALEXANDER: All right. Thank you for joining us here this evening. We just want to take a little bit of time and go through a discussion on the review status of the 2009 Saltstone performance assessment.

So in regards to an outline, we're just going to walk through the NDAA history of Saltstone, the current Saltstone PA review, which incorporates some new DOE research, some of the model assumptions, and some of our concerns with those assumptions in regards to the base case as well as looking at some alternative analyses, and then a summary.

So starting off with the history of the Saltstone project -- and it's easier if I don't look at the screen the whole time. In 2005 the NRC reviewed DOE's performance assessment, which identified numerous key assumptions and certain uncertainties, and the TER that was concluded in 2005 concluded that the performance objectives could be met if certain key assumptions were shown to be valid in monitoring.

Since that time, DOE has conducted additional research, and NRC has reviewed that additional research as that has been made available to us, and that additional research as well as recent observations and new vault designs have been incorporated into a new PA, and NRC has been reviewing that PA since 2009.

So also in regards to the history of the Saltstone project, the monitoring plan discussed eight key factors that were important towards assessing compliance, and in general these relate to the waste form and vault degradation, the effectiveness of infiltration and erosion control -- I guess that's not going to work -- as well as estimation of the estimation of the radiological inventory.

Also in terms of a time line, as I mentioned, in 2005 we submitted a technical evaluation report, we identified certain open issues in 2009 through -- from 2007 through 2009. In August of 2009, NRC observed the DOE LFRG review of the Saltstone PA, then this April we submitted a request for additional information.

We had the DOE responses in July, we had a phone call in September, and we recently submitted an additional round of -- addition requests for additional information in December, this past December.

So some of the key points on the NRC review of the 2009 PA, it was looking at the integration of the new data that was incorporated into that PA, it was a risk informed review that focused on those key factors, as well as updated information from monitoring.

The review was primarily focused on the base case; however, we also looked at several alternative analyses, and as I mentioned, the request for additional information, the first round was in April and then we recently submitted a second round in 2010, and that's pending currently.

So some of the additional research that has come. Our 2005 concluded that we'd have reasonable assurances if key assumptions were shown to be valid during monitoring. Since that time, additional research has come in certain areas that I'll discuss in more detail, including the hydraulic properties of Saltstone, the physical integrity of Saltstone, the fracturing of vault walls, the reduction and retention of technetium at Saltstone, as well as some inventory changes.

In addition to some of the new research, we had some questions in regards to some research quality in regards to the experimental data and the references. I apologize if the font is a little bit small. Some of our questions and comments on that, the first one is in regards to the experimental conditions. Sometimes they're inconsistent with site conditions.

For instance the hydraulic conductivity that was used in the Saltstone performance assessment for Saltstone was based on laboratory samples and may not incorporate all for the uncertainty when you go from the laboratory towards field conditions, which I'll explain in more detail.

There were some errors in experimental design and conduct which were noted in the request for additional information, and some of our discussions that we've had with DOE, one of these was in regards to the redox potential. I'll discuss that in more detail.

In some cases the exclusion of data, and we're not certain if that was -- if that may or may not -- if that should be incorporated or not, and that -- one instance of that is with the reduction and retention of technetium, and that will also be discussed, a reliance on preliminary research for some key assumptions we had some questions about that we needed to have some more information before we moved forward.

And in some instances there was limited site-specific data, and for some of those limitations there was a reliance on some references, which is not uncommon; however, some of those -- some of the use of those references, one of the points is that it's often buried in a lengthy reference chain, which isn't a problem in and of itself. However, when you dig back through some of these references, there are some issues.

For one instance, sometimes a cited reference does not support the assumed value in the PA. The PA may point to a document and it'll say the partition coefficient for selenate is this, and when you look at the document, it points to selenite.

Some experimental conditions for generic data significantly differed from Saltstone. The K_ds that are relied upon in the PA had values that were determined from a formulation that used a strong reducing agent, such as sodium dithionite, which isn't present in saltstone, and we need to understand if the values that were assumed in the PA are consistent with saltstone as well.

Some of the references, when you dig back, are based on personal communications, certain pathways, biosphere pathways were excluded based on personal communications, and we were looking for additional model support for the exclusion of some of those pathways.

And in regards to expert elicitation, the NRC has some documentation for a transparent approach to expert elicitation documenting how it was done in independent review, and we had a couple of comments on that.

As I mentioned, our review focused on the base case, and some of our concerns with the base case was that in some instances it was inconsistent with no conditions. And we feel that the base case should incorporate all relevant known conditions and reasonably account for uncertainty. Some of the inconsistencies with known conditions that we're trying to understand if it's significant to the model, one is the base case does not assume any fracture under the Saltstone monolith.

Another instance is the annuli that exists in between the saltstone -- as the saltstone is poured and cured, it shrinks and there's an annulus that forms in between the saltstone and the vault walls. So we need to understand what the effect is of these fast pathways.

Some other high-level comments were in regards to limited model support in key areas. Depending on the amount of risk reduction that is assumed for certain engineered and natural barriers, you need to -- you should have a commensurate level of model support for those areas.

If you have a barrier that leads to a risk reduction of a factor of 100, there should be multiple lines of evidence supporting that, whether it's laboratory results, field experiments, expert elicitation, multiple models. So we had some question in regards to additional model support.

In terms of uncertainty, clearly there's a large degree of uncertainty in projecting these dose responses out into thousands of years. And we had several concerns with uncertainty, and in our first RAI, DOE addressed some of these concerns with a one-off sensitivity analysis, where they would take the base case model, adjust one parameter to a bounding assumption and show that it wasn't -- didn't result in a significant dose effect.

And our concern is, when there are many uncertainties and it's not clear how these uncertainties may interact, these parameter changes, we felt that these should be incorporated into a single base case, and this is one of the comments that we put into our second RAI asking for these uncertainties in parameter -- potential parameter changes to be incorporated into one base case.

Some of -- we also had some specific technical concerns such as the technetium reduction and retention, and these issues that I will get into in more detail momentarily. The first one is the release of technetium. It's very bimodal. If the technetium is reduced, it's going to be immobilized. If the technetium is oxidized, it's considered a highly mobile constituent. And technetium is a key radionuclide.

So the issue is that saltstone, with the slag as a reducing agent, exists very close to that margin of oxidizing and reducing. So we have a lot of questions, and as an open issue on whether or not the technetium is reduced or retained.

As I mentioned, there is -- the model uses a Kd value, which is a partition coefficient, or the distribution coefficient, so that is just a ratio of the -- of a contaminant in the solids relative to the liquids. So a high Kd would indicate that a large percentage of that contaminant will be retained on the solids and very little will be in the liquid.

So we want it to be a higher Kd to make sure that the technetium is retained. And the values in the PA use 1,000 milliliters per gram, and this is based primarily on research -- a research paper by Bradbury and Sarrott, and it's based on a formulation that is somewhat different than saltstone.

It uses a strong reducing agent, sodium dithionite, which is not present in saltstone. So we want to make sure that slag, which creates the reducing in saltstone, is also capable of producing those reducing conditions and will provide lasting reducing conditions.

Some of the research that DOE has conducted since 2005 has indicated that the Kd may be less than 1,000 milliliters per grams, rather it's less than 1 or less than 100, it isn't clear, or maybe it is 1,000, depending on different research conditions. So we asked some questions to get a better understanding of what that Kd value is to understand, to make sure that the technetium is reduced.

And as I mentioned, the technetium exists very close to that margin of oxidizing the reducing conditions. This is a Pourbaix diagram with the redox potential on the vertical axis and the pH on the horizontal axis. Everything in gray is where the technetium is reduced. So the gray area is where we want to be, the white area is where the technetium is oxidized.

And the values that were reported in 2007 indicate -- is the red line, and -- let me see if it comes up. All right. So the line that just came up is from the pH of 10 to 12 and this is roughly where we exist with saltstone in terms of pH. And the values that were reported in 2007 for pure blast furnace slag indicated that -- between a pH of 10 to 12, we're very close to oxidizing and reducing.

However, those measurements were not adjusted for in terms of the standard hydrogen electrode, which is the measurements were taken with a silver chloride electrode and not adjusted to the standard hydrogen electrode, which is what this graph is in reference to. So when you correct that value by the 200 millivolts, it moves up vertically to the blue line.

So between 10 and 12 we're further into that oxidizing region. So we had some questions as to better understanding of making sure we're in the gray area, and that it'll continue to be in the gray area throughout the compliance period hopefully.

Moving into the hydraulic conductivity, hydraulic conductivity just relates how much water is going to flow through the system, and the dose is very sensitive to the hydraulic conductivity. The more water that flows through the saltstone and the vaults, the higher the dose.

So in 2005 the hydraulic conductivity was -- with the initial conditions was 1E to the minus 11 centimeters per second. Additional research has been done between 2005 and 2009, and hydraulic conductivity was increased to 2E to the minus 9.

There was some additional research that indicates that the hydraulic conductivity has a potential to be higher than that when you take into consideration some other factors. The value of 2E to the minus 9 was on several laboratory core samples, and generally when you go from a smaller sample to a larger sample, such as a field scale, hydraulic conductivity can be increased over those laboratory samples.

Also there could be a significant difference between preparing these samples in the laboratory versus field emplacement, so the hydraulic conductivity may be higher in the field than it is in the laboratory.

And another issue is the curing temperature. The saltstone, when it cures, may be at an elevated temperature over the room temperature that the saltstone was cured at. And if it is at a higher temperature such as 60 degrees, the research that was conducted by DOE indicated that the hydraulic conductivity could be as high as 80 to the minus 7.

And clearly these are very small numbers and what's the difference between minus 11 and minus 9. At E to the minus 11, that is water moving on centimeter in 10,000 years. At E to the minus 9, that is 100 years to move one centimeter. And when we get closer to E to the minus 7, we're talking about water moving through saltstone as centimeters per year, which can have a potential significant effect on the dose.

So we need to understand better where we're at with the actual in-place saltstone, and DOE is working on producing some core sample measurements so we can have a better understanding of exactly what's happening in the field and not having to rely on these laboratory measurements so we can eliminate some of that uncertainty.

Some other questions that we had were in regards to the moisture characteristic curves. Under saturated conditions the hydraulic conductivity defines the flow through the system. However, under unsaturated conditions, as you start to remove water from the system, it's a combination of the permeability and the relative permeability.

So if the -- on the horizontal axis we have saturation, on the far end is 100 percent saturated. So at 100 percent saturation -- I keep pointing with the pointer that doesn't have a pointer -- at 100 percent saturation, the relative permeability would be one. However, as you decrease that level of saturation, the relative permeability decreases.

The curve at the top is for the -- for concrete medium quality, and this is consistent with what is shown in the literature. So at about 99 percent saturation, which is what the PORFLOW model indicates for saltstone, it would have -- and keep in mind -- oh, thank you very much, I appreciate it.

(Pause.)

MR. ALEXANDER: Okay. So for saltstone we have a hydraulic conductivity of 2E to the minus 9, and it exists at a saturation of 99 percent. So if you go up, you have a relative permeability of 1E to the minus 2. So in effect you decrease the relative permeability by two orders of magnitude.

So in the system, when you remove 1 percent of the water from the saltstone, from the porous face, you have a decrease in hydraulic conductivity of two orders of magnitude. So in effect you go from 2E to the minus 9 to 2E to the minus 11. So instead of 100 years per centimeter, you're back up to 10,000 years per centimeter.

Some of other questions in regards to the moisture characteristic curves are also used to design the -- to talk about the flow through fractured cementitious materials. So the walls are assigned a very high hydraulic conductivity of .17 centimeters per second, which is very high.

However, the walls exist at a saturation between 99 and 95 percent, and the moisture characteristic curves that are in the PORFLOW model indicate that the hydraulic conductivity would be nine orders of magnitude less when you decrease that saturation by .7 percent.

So although the PA states that the hydraulic conductivity is .17, in effect it restricts the flows by an additional nine orders of magnitude, so it's about 1E to the minus 10 is the flow through the walls. And when you look at the intermediate outputs from the PORFLOW model, it indicates that the walls are actually acting as a barrier to flow.

So we had some questions and we needed to better understand what the effect is of these curves, if these curves might be higher up, what would be the effect on the dose. So that -- so DOE is working with us on looking at those curves and what the effects are.

When we start to put some of these issues together, we end up with a conceptual model that may be different than what the PA is indicating based on what the model may be doing down in some of the details, in some of those weeds. So on the left, this is the NRC's interpretation of the base case, and on the right is what we would consider like with the known conditions and taking into account uncertainty.

In the DOE model, the Saltstone is considered to be intact, whereas based on video images, the Saltstone is fractured. And it's not clear to us what the effect is of that fracturing. In addition, there is an annulus that's been shown to be present in the Saltstone vaults, which aren't taken into account in the DOE base case model.

In regards to the vault walls, as I mentioned, the DOE model indicates that the hydraulic conductivity is very high; however, the relative permeability effectively decreases that hydraulic conductivity. So we don't have -- we have a flow barrier for the wall. And taking into account a moisture characteristic curve that we might expect would allow for invective release through the walls.

In addition, we have a material interface, which for engineered materials has a tendency -- engineered materials have shown a tendency to leak at these material interfaces, and is a potential fast pathway as indicated in the DOE base case model.

Then as we move down from zero years to 8,000 years, looking at the difference, like with the DOE model, on top of the vaults there's a two foot thick lateral sand drainage layer, and on top of that lateral sand drainage layer there's a geotextile filter fabric that prevents larger particles from migrating into the sand, and it's responsible for the shedding of 99.8 percent of this water, even at 8,000 years.

And we had some questions if this geotextile filter fabric fails and you get the migration of particles larger than colloids, potentially of the overlying backfill material, and if the roof fractures, all of this water -- some of that water may be migrating into the system.

And at 8,000 years we still have a Saltstone monolith that is not fractured. We had some questions on the longevity of the reducing conditions. And based on the flow through the walls and the flow through the saltstone, we end up with a diffusive release in the DOE, whereas we would expect more of an invective release occurring.

So we also wanted to understand what the effects -- we weren't able to run the model from start to finish with each of these. DOE was able to provide us the model files and we looked at the effective flow through the system when you change some of these parameters.

So in this graph, on the vertical axis we have the factor of flow greater than the base case. So if you take the base case, and this is the amount of water flowing through the system, it would just be one. And for number two I revised the moisture characteristic curve for saltstone and the clean grout, the overlying clean grout with values that are more typical in the literature. And it increases the flow by a factor of 14.

I also took a look at if we revised the lateral drainage layer. If we used the values for the overlying backfill, if that backfill migrates into the sand, it will have also an increase flow factor of 14. If the hydraulic conductivity is not 2E to the minus 9, if it's the same hydraulic conductivity with the experiments that were conducted at 60 degrees, it would increase the flow by a factor of 145. And these three factors together would result in a flow increase of a factor of 226.

And I just want to point out that this increased flow factor doesn't necessarily correspond to an increased dose factor. There are other values in there that have an effect. So some of our questions are we want to understand what the dose effect is when -- if these values are -- if the PA values are closer to some of these values.

And I also wanted to point out that these flow increases don't take into account fracturing of the saltstone or vaults, the flow through the walls, and the hydraulic conductivity that accounts for degradation or scale or field emplacement.

I also wanted to mention that the NRC is not constrained to review solely the base case model. We don't have to rely on that for compliance determination. We can look at alternative cases if we feel that better represents the system and we can have reasonable assurance that the performance objectives will be met.

DOE provided several alternative analyses. We had some concerns, there's several limitations with some of those alternative cases. However, the synergistic case which was provided by DOE goes a long ways towards some of our concerns.

The synergistic case was developed in response to LFRG review, and is considered a pessimistic case that looked at the synergistic failure of several engineered barriers that included the earlier degradation of the closure cap, degradation of the vaults at year 500, and the fractured saltstone enclosure.

Some of our concerns with the synergistic case, there are potentially a lot of conservatisms in the synergistic case. However, when you start to look at some of the intermediate results, there may be some optimism in the -- how the model is handling some of these inputs. So we need to -- we asked for a better understanding of how these conservatisms and potential optimisms weigh out.

And some of our concerns are the flow through the saltstone such as the moisture -- some of the moisture characteristic curves still, some of the hydraulic conductivities, also the reducing capacity in some of the biosphere parameters.

In addition to the synergistic case, DOE also provided a hybrid approach, which the NRC does not disagree with. It's a deterministic PORFLOW model that is coupled to a probabilistic GoldSim model. And some of our comments in regards to the hybrid approach was that it is built on a PORFLOW model that we have some questions about. So some of the data coming out of the GoldSim model, we have some questions because we have questions about the PORFLOW model.

And we also had some questions in regards to the probability of the different cases, such as Case A is assigned a relatively high probability and Case A doesn't assume fractured saltstone. So we have some questions in regards to whether or not the probability for Case A is high. In addition, we had some comments in regards to the bases for the parameter distributions for the inventory and the Kd values.

So just in summary in regards to the history of the Saltstone project, we reviewed the 2005 PA, our conclusions of reasonable assurance were based on key assumptions being met, we've reviewed additional research as has been made available and NRC is currently reviewing the 2009 PA.

The request for additional information was risk informed focusing on the key factors that were identified in the monitoring plan, and we just want to -- and in general we want to make sure that the conceptual model is consistent with the mathematical model in many areas in regards to the as-built conditions, some of the degradation processes over time, and the flow through the system. And we also had comments on the bases for key data and parameters, as well as model support in additional areas.

I believe that's it. If -- Nishka, are we going to questions at this point?

MR. SUBER: Yes, yes. Yes, we were going to open up -- this is Gregory Suber. We were going to open up the floor to anyone who has any questions on the NRC presentation.

(No response.)

MR. SUBER: No one in the audience? Anybody on the phone have a question on the NRC presentation?

FEMALE VOICE: Not at this time.

MR. SUBER: Okay. Very well. Well, thank you.

FEMALE VOICE: Not right now.

MR. SUBER: All right. Thank you, George. Appreciate that.

Okay. So I guess then we will turn the podium over to DOE.

And I believe, Pat, you're the first speaker.

MS. SUGGS: Thank you.

I'm Patricia Suggs. I'm the Salt Processing Team Lead for DOE at the Savannah River site, and I'd like to talk about Saltstone operations and monitoring.

My purpose here tonight is to provide a status or our operations and monitoring activities, and that includes several things, salt waste processing.

And we are currently operating our interim salt processing process -- we call it ARPMCU; it's performing very well, in fact, much better than we anticipate before we turned it on, so we're very pleased with its performance.

This includes -- followed by -- salt processing is the Saltstone disposal operations, and then I'll describe also DOE's process for disposal operations. And at that point in the program I'll turn it over to Ms. Ginger Dickert to discuss some of the technical issues that we heard from the NRC on, and then DOE's approach to address their requests for additional information and our path forward.

At Savannah River, our liquid radioactive waste is stored in underground waste tanks. It's in three different phases, three different physical forms: sludge, saltcake, crystalized saltcake, and supernate. And if you see -- if you're able to see the photos, the top one is the liquid salt waste we commonly call supernate, the middle photo shows the crystalized solid salt waste, and the bottom photo is our sludge waste, and that's the minority of the waste type that we have at Savannah River.

Am I too loud? No? Okay.

The sludge waste is vitrified at the Defense Waste Processing Facility and those -- after being processed into borosilicated glass and placed into steel cans, they're stored for alternate future disposal at a different location.

The salt waste is processed to remove the radioactivity -- that includes strontium, actinides and cesium -- for vitrification with the sludge so that those radionuclides do go with the sludge to ultimately be co-disposed with the sludge.

And then lastly, the decontaminated salt solution is treated at the Saltstone Processing Facility and disposed of onsite as a low-level waste at the Saltstone Disposal Facility.

At the Saltstone Disposal Facility, the decontaminated salt solution is mixed with a reducing grout, which you heard George allude to earlier, to form a solid, stabilized waste form, and it's placed in engineered barriers for disposal.

The Saltstone Disposal Facility is permitted by South Carolina DHEC as a Type 3 landfill. Historically, Saltstone has been used to dispose -- disposition of low-level waste streams, mainly resulting from our Effluent Treatment Facility, operation of that facility, and that's a very low-level water treatment, final treatment process.

And then since February 2008, again, following consultation process with the NRC, in accordance with Section 3116 of the NDAA of fiscal year 2005, a new law, DOE has dispositioned decontaminated salt waste at Saltstone Disposal

Facility.

Just a note that from the consultation process, DOE and NRC base their conclusions on analyses performed from several technical documents, a 1992 performance assessment, a 2005 special analysis, a 2005 performance objectives demonstration document, and the basis document for the DOE waste determination, and then lastly, responses to NRC's request for additional information at that time.

Since the consultation process has been completed, in accordance with Section 3116(b) of the NDAA, NRC's been performing monitoring activities, which is different from the consultation portion of the process, in coordination with South Carolina DHEC, our state regulators, since 2006, well, actually since we existed the consultation phase in 2005.

To let you see what Saltstone looks like, and I know the folks on the telephone can't see this, but the Saltstone Production Facility is where the decontaminated salt solution is mixed with flyash, slag and cement and that's roughly a 45 percent, 45 percent, 10 percent dry mixture. It's poured in the concrete vaults to solidify.

And then at the disposal facility themselves, they're engineered disposal facilities, they've got low water permeability, and excellent -- or the -- an excellent non-leaching qualities of the grout waste form, and there is a non-hazardous product there.

Looking at the photos, you see an aerial photo at the upper right, the largest rectangle is Vault 4. Just to the right of that is Vault 2, at the bottom of the photograph is the Saltstone Production Facility where the grout is mixed with the low-level waste liquid.

And then at the bottom you'll see two of our new newly designed engineered disposal facilities, and you'll notice that they are round rather than rectangular.

These are still under construction and, in fact, we, you know, have welcomed NRC coming to see these as we develop them. They have some -- and we think, you know, it's nice to have new features that we would consider improvements from approaches from 20 years ago. So we're very pleased with those.

And again, we cannot use those until we have completed the process we're in right now. To complete performance assessment, these need to be incorporated into a performance assessment.

And then of course in the photo on the

bottom right you see an artist's rendition of how a vault may look after it's been covered with soil caps and clay barriers that would be its ultimate lay-up form at the time of closure.

DOE describes its approach for disposal operations in DOE Order 435.1, and that gives us certain instructions. It tells us to regularly assess the performance of our radioactive disposal facilities. We prepare annual reports for review by the DOE Low Level Waste Federal Review Group, and that acronym we usually use is LFRG.

It tells us to maintain the currency of our performance assessments by performing maintenance plan activities, this could be research and development activities to generally stay as current as possible with the conditions at the facility, or with the evolving technical knowledge; perform research and development activities to strengthen our knowledge and the technical basis of the analysis; and it also considers new research, or new information rather coming from research and development, or changes in physical -- or understanding of the physical parameters around disposal areas, ground water modeling data, facility operations; and then to update that analysis as appropriate.

The performance assessment that we are currently working on, you know, includes new information from ongoing research and development activities. It includes lessons learned --

(Pause.)

MS. SUGGS: The performance assessment we are -- I think this is okay -- we are currently working on includes new information from ongoing R&D activities, incorporates lessons learned from the consultation process and monitoring activity under 3116, and it includes an analysis, importantly, for the newly designed disposal cells, and it's informed by our own ongoing salt processing activities that may alter what we have used as assumptions, so we keep up with that.

The analytical approach is consistent with that that was used for the F Tank Farm performance assessment, and it was provided to NRC, South Carolina DHEC, and the public well in advance of DOE decisions. It's really rather lengthy.

In George's presentation he said, you know, they started working on it in November 2009. We began this process back in 2008 and we have still some more to go. So it's technically complex and the best way to get a good product is to engage all the different participants as early as possible.

At this time I'd like to turn the podium over to Ms. Ginger Dickert. She's going to address some of the technical issues raised by the NRC. Ginger works for Savannah River Remediation and she is the manager of the Closure and Waste Disposal Authority, which includes performance assessment development and coordination.

Ginger?

MS. DICKERT: Good evening. It's my pleasure to get to talk to you this evening. I'm going to cover a few things.

I'm going to start out with a little bit of background, how did we get where we are and how do our processes work, and our interactions between the Department of Energy and the Nuclear Regulatory Commission, talk about the process of developing the performance assessment, the work that was done to develop these inputs and assumptions that we're discussing tonight, and then discuss some of those technical inputs and assumptions and parameters that have been already mentioned.

To give you an idea of the scope of the performance assessment, the performance assessment covers the current and the future disposal activities that will occur throughout the life of this program. The circles that you see here will be our future disposal cells. They are, as Pat Suggs mentioned to you, a new design, a round design. The current facilities, Vault 4, Vault 1, which is no longer in use for Vault 1, you can see those are already constructed.

I've also included for your future use, if you should take a copy of the handout, a list of acronyms because we are a very acronym-prone group, and I will probably slip into the vernacular before the evening is over, so I've put you a list in there that you can have for the future.

At the bottom I've also put a little bit of information about some of the key radionuclides that were mentioned in George Alexander's presentation so you can see the half lives of those materials, and then how we get to the radium 226, which is one of our risk significant radionuclides. The radium 226 does not exist today, but in-grows through the decay first of the uranium 234 to thorium 230 and then further to radium 226.

Okay. Back up to what is a performance assessment. A performance assessment is really a risk assessment tool. It has been used extensively in the work that's being performed at the Savannah River site, not only for the discussions that we're having with the Nuclear Regulatory Commission, but also in the discussions that we're having with South Carolina Department of Health and Environmental Control, and with the Environmental Protection Agency, and serves as the backbone for all of those decisions.

This is the process of evaluating the fate and transport of both the radionuclides as well as any hazardous chemical constituents for the long term throughout the environment as a result of the actions, disposal actions that we're currently undertaking.

It provides the best estimation of what the consequences over the course of time, both from chemical and radionuclides -- radiological will be over extended periods of time. It addresses uncertainties, it recognizes that there are uncertainties and what's going to happen over the next 10,000 and 20,000 years. And it reflects the uncertainties associated with that analysis.

The modeling is performed also to determine which things the system is most sensitive to. In other words, which parameters are most important to have the lowest uncertainty on. Those parameters which really don't affect the fate and transport are not the ones that we want to concern our attention to.

Pat Suggs mentioned that the DOE and DOE Order 435.1 which governs the management of radioactive waste. In that it defines the process to be used for the development of performance assessments. Initially, a performance assessment -- I'm going to work my way from left to right on the top line -- a performance assessment will be developed.

It's then reviewed through DOE Savannah River. This group is a group of local, federal technical personnel, as well as expert subcontractor expertise that is brought in to specifically review that document. Revisions from that process are incorporated.

The document then goes through a much -- another robust review within the DOE process. This is the Low Level Waste Federal Review Group, or LFRG. There's the LFRG acronym that you'll see us use. Again, this is additional federal technical personnel along with other subcontractor experts.

Upon the completion of that review, it goes to the DOE headquarters and the Office of EM-40 for final approval, and results in the issuance of a saltstone disposal authorization statement. This is, if you will, is analogous to a state permit, it is the DOE authorization for the regulation of the radionuclides that would be disposed of in this facility.

The DOE 435.1 also requires a monitoring plan, and a long-term closure plan, and requires an ongoing PA maintenance process. The ongoing PA maintenance process involves an annual review of the current performance assessment to assure that it still reflects the latest knowledge and the latest performance actually observed of the system.

That is documented in an annual report which is provided to and approved by the LFRG at DOE headquarters, and also the update of a performance assessment maintenance plan.

Now, a maintenance plan, it's not your typical definition of maintenance. This is really what parameters do we need to continue to addition research and development on to reduce the uncertainties, where do we need to be reflecting changes that we're seeing in perhaps operating conditions, or those things in the performance assessment.

The research and development is conducted, and then we have the opportunity to perform a special analysis, and you heard that for Saltstone one of those was performed in 2005 that can update the performance assessment, or it can result in a PA revision if there are significant changes that are needed.

We have a process for reviewing any of those changes to determine if that revision is needed called an Unreviewed Disposal Question Evaluation, and that's really taking new information and comparing it against the current assessment to see if a change is needed. It's as a result of this maintenance process that the current revision, the 2009 Saltstone Disposal Facility PA revision was generated.

Now let's lay in on top of that the NRC involvement. The National Defense Authorization Act, Section 3116, added an additional agency into the process for additional oversight and review, and that is how this process works.

The draft basis document for the waste determination was developed that included the performance assessment information. The NRC conducted their review under the consultative phase of 3116, and issued their technical evaluation report. This is the one that contained the eight factors that George Alexander discussed earlier.

We have, at the site, the Section -- actual waste determination and the basis document were issued, and then the NRC issues a -- develops and issues a monitoring plan of the things they're going to be doing both in site field observations and in ongoing review of technical research and development that occurs throughout the life of the program.

Again, in the monitoring phase of the NRC and DOE interactions there is a continuous loop cycle as well where we generate additional research and development information and review that with the Nuclear Regulatory Commission. They issue observation reports, follow-up reports, and we consider that and use that information in our evaluations as well.

What types of interactions do we have between the two agencies in monitoring? I already mentioned on-site observations where the NRC staff actually comes out, visits the facility, sees the operating conditions.

Today we had an observation visit, had some folks who actually were out touring around the vault observing vault conditions and getting a review of some of our last quarter of -- the last quarter of operation.

They also do technical reviews. We hold

routine interactions where we review new technical reports as they are issued to understand their implications. They involve preparation on both parties' part, conduct to the interaction and then follow up. And all of these are documented and the results of those are publically available.

Our ongoing R&D activities are used to reduce our uncertainties and to demonstrate the validity of the assumptions that we've used. The DOE has prioritized activities. Now, these ongoing R&D activities had begun even before the existence of the 3116 legislation.

However, with the development of that legislation, and the input that we have from the TER and the eight factors, the Department of Energy used that to inform the prioritization process for what research and development is most important to be done early, the first things that need to be done and where that R&D needs to be focused.

It's a very specialized set of research. And again, it's focused at the things that are risk significant. It's a risk informed approach, and it's focused on risk significant items.

Those PA results are either incorporated directly into the performance assessment, as in this case the new performance assessment was developed, or are reviewed through the unreviewed disposal question evaluation process to assure that the PA was still binding and valid based upon that new information.

This is a chart that we actually use between the Department of Energy and the Nuclear Regulatory Commission. It has been existence -- in existence since the first documentation review that was performed in 2006. The information was -- this chart is developed and tailored to the eight factors to show how each of the pieces of R&D we're doing align with the eight factors in that TER.

The activities at the top -- the colors don't come out very well -- on my laptop and on the handouts you can see that these activities are green, but that doesn't look very green on that projection. The activities that are in white are those that have not yet begun, the activities in yellow are those that are still in progress, and the activities in green would be those that have been completed.

At the start of -- when we began using this chart the activities at the top were not green. They were either yellow, already in progress for research and development that was ongoing, or white for work that had not yet begun. As we continue the research and development and the completion of each step, we hold our technical reviews with the Nuclear Regulatory Commission and then update this chart to show the progress.

The document numbers on the left represent the actual technical documents that document that research and development, and all of those documents are publically available as well.

One other point I'll make on this one -- I'm going to have to get water here in a minute -- the research that was here was prioritized as the most important, and all of these were completed in a manner in a which they could be incorporated -- on timing where they could be incorporated into the 2009 PA. These additional activities, research and development activities, are still ongoing and are not yet reflected in the 2009 PA.

DOE has made a significant past and ongoing investment in the R&D activities associated with the Saltstone Disposal Facility. As you can see, millions of dollars are being spent every year to reduce the uncertainties associated with these assumptions and inputs to the performance assessment.

Each year, as part of the 435.1 maintenance process for performance assessment, the projected and planned maintenance for both the next year as well as out -- looking out for several more years, is updated. So though you see a decline here, that's simply reflecting what we know today will occur there. As we do this testing, these are frequently revised on an annual basis, along with funding allocation necessary to support that R&D.

Now I'd like to look at a few of those actual test results. This, again, I'm showing you actual charts that we use between the Department of Energy and the NRC, and this one deals with -- at the top, deals with hydraulic conductivity.

The initial testing that was conducted here -- we recognized that we had one data point in this test -- during the course of the conduct of this test, a power failure occurred in the laboratory, and so one data point on that test was skewed as a result of that power failure. That experiment was damaged.

We reported in that report -- for the sake of completeness, we included that value, but noted that it was an invalid value. The remainder for the values that were observed were very closely coupled, a very tight data range, and therefore those were used as the basis of the assumptions, because this is the piece that was finished when we started the Saltstone

PA.

Since that time we've done some additional testing and additional reports. Out of this work we were exploring not only testing which would demonstrate the expected conditions in the Saltstone facility, but also did a number of different mixtures and different experimental cases that would look at ranges of parameters.

What we are trying to do with that was to understand what factors were most important in the operation of the facility to the resulting hydraulic conductivity of the grout form, of the solidified waste form.

George talked about the work that was done at a cure temperature of 60 degrees. Although we don't typically have those kind of temperatures in our facility, we did do a test where we elevated the temperature to 60 degrees. We wanted to see whether -- how important that parameter was so we knew how tight our controls in the operating of the facility needed to be.

And we found that the solidified waste form is indeed sensitive to temperature. That has led to additional testing to help us define some of those operating parameters so we know how tightly we need to control that in the facilities.

The lower section of this chart is related to the Kd values, again, a very important parameter for our use. The first -- this is an area particularly for technetium where we've had some experimental difficulty. In our initial testing we had some difficulties in maintaining a non-oxygen environment so that we could conduct the test.

The first testing we had -- the experimental test was contaminated, if you will, with oxygen, and therefore the test was terminated. We recognized that and changed the experimental setup.

Additional equipment to be able to perform the test in an inert environment was purchased for the Savannah River Laboratory, the experimental design was performed so that we could get a better test, and all of that testing is culminating in this final testing here, which we expect to have available at the end of March.

These sets of data, the experimental difficulties of those have been addressed with this, and the preliminary results that we have from the current testing show very strong support for the hydraulic conductivities used in the performance assessment.

Again, this is another chart that we use. This one was looking at samples out of the actual Vault 4. We recognize that it's -- any time that you make a simulant, it can vary from the actual as-emplaced material. These were attempts to actually get some of the solidified waste form from the Vault 4 and test those actual parameters and not just have to test simulants.

What we found was that our solidified saltstone is a very hard, a very solid waste form. As we tried to take this sample, we had to do a dry core drill. If we had used the water, the water itself would have contaminated the sample and invalidated the testing that needed to be performed.

If you're familiar at all with any concrete core drilling, you know that you use water because you generate a lot of heat with that bit as you try to cut through that concrete. And, in fact, we did. We saw some -- as a result of that high heat generated by the bit, we saw some cracking around the bit itself, we saw some crumbling of the edges as we were trying to cut through that.

Once we successfully got a core sample and had to break it free and pull it out, we found that we couldn't readily remove the sample from the bit, and actually had to break the sample into pieces to get it out of the bit.

In the course of doing that, a good observation, when the saltstone solidified product is in a reducing state, it has a distinct color unlike that of natural concrete and distinctly different from that of oxidized -- of an oxidized material, and so we did see that very distinct reducing environment.

However, because of the amount of work that we had to do to get it out of -- the core sample, that, in fact, invalidated it for some of the tests that we wanted to do. Those were -- these results, again, the ones that are in green, have all been reviewed with the NRC.

We've gone to evaluate new methods. Our engineering folks have developed an entirely different technique where we're going to try to get some additional samples where we don't compromise the ability to do the tests that we want to do as a course of actually obtaining the sample. We have reviewed those alternate methods with the Nuclear Regulatory Commission in July of 2010, and are continuing to have discussions relative to that potential sample methodology.

I will tell you that there is a

significant amount of research and development going on to -- very focused on the things that are risk significant, very focused on the items that are identified in the eight factors of the TER.

The development of the performance assessment in the waste determination is not just a single document, but it's really quite a journey. And this documents a part of that journey. There's a poster in the back of the room that contains the entire time line.

(Pause.)

MS. DICKERT: Starting here, the Saltstone waste determination basis document was published in April for 2005. This then entered into an extensive review and consultation process with the Nuclear Regulatory Commission, with the -- culminating in the issuance of the final waste determination basis document in January of 2006. It was at that point that the monitoring activities were initiated.

As well as that, during this process it was identified that there were a number of technical issues between which the two agencies had different protocols and policies. So a number of meetings occurred. These were public meetings to address general technical issues and to address methodologies and protocols for moving forward, to inform the next set of actions of that type that were taken.

We initiated another performance assessment for the F Tank Farm Facility in February of 2007. In conjunction with that, we started a new process of holding scoping meetings between all of the effective agencies to gain agreement on the inputs and assumptions that would be used in advance of performing the actual analysis.

A series of meetings was held across a period of 11 months to define all of those inputs and assumptions, including modeling parameters, the types of model -- conceptual modeling that would be done, and that resulted in a performance assessment for F Tank Farm issued for review in August of 2008.

Those scoping meetings not only occurred between the Department of Energy and the Nuclear Regulatory Commission, but also involved South Carolina Department of Health and Environmental Control and the Environmental Protection Agency to ensure -- as I said at the beginning, our performance assessment is used to inform all of these decisions, so we wanted to ensure that all of the agencies had the opportunity to participate in the development of a consensus set of inputs and assumptions.

And there was a lot of comments received on the performance assessments and held during these scoping meetings from the public, the EPA, and South Carolina DHEC, as well as the Nuclear Regulatory Commission.

The hydrogeology, the assumptions relative to consumption by individuals are the same for the Saltstone Disposal Facility as the F Tank Farm Facility and therefore the results of the F Tank Farm scoping meetings were applied in the development of the Saltstone Disposal Facility performance assessment.

I've provided some information here for the folks in the public to where you can find the meeting minutes for those meetings, the website for the DOE posting, and the session numbers in the ADAMS system if you wanted to find those on the NRC system.

That was not the end of the journey. The F Tank Farm performance assessment, we received comments back on it in January of 2009, continued to use that information in with our Saltstone Disposal Facility performance assessment development, resulting in the performance assessment being issued to the LFRG for review in June of 2009.

To give you an idea of what is an LFRG

review team, this is a group of people, and this is actually two slides and I'll cover both, but it's a group of very senior, very technical personnel not only from within the Department of Energy, but recognized experts from universities and other specialized groups, to assure that we're getting a very broad cross-cutting in depth review of the performance assessment.

As was noted previously, the Nuclear Regulatory Commission did observe the LFRG review of the Saltstone Disposal Facility PA as part of their monitoring activities and documented in NUREG-1911 revision 2 that they found the process to be thorough and comprehensive.

This was the conclusion of that LFRG review. The comments were incorporated and then the Saltstone Disposal Facility performance assessment was issued to the Nuclear Regulatory Commission for their continued review in their monitoring role.

Those activities continued with the issuance of a set of RAIs, responses, and the second set of RAIs being issued in December of 2010. At the same time our other performance assessment development activities have continued. So there's been much opportunity to take the information that we're gaining from each of these performance assessments to inform the development of each subsequent one, and we've been using that information in that way.

The PA development is a very rigorous and thorough process, it undergoes multiple, very rigorous and thorough reviews to ensure that we get the absolute best product that we can get to be representative of future conditions.

Looking at some of the things that are considered, and transport of the environment is very important to understand, the geological and hydrogeological conditions under the facility. We're very fortunate that this area has been extensively studies for over 60 years, and we have a tremendous wealth of knowledge of not only the substructure here where you see -- in fact, under ours we have three separate aquifers, but only where those aquifers are, but we have very well characterized flow and flow rates through those aquifers and that's very beneficial.

This has been one of the most characterized areas -- the Savannah River site has been one of the most characterized areas in the nation. And so we benefit from that strong characterization.

What are the scenarios that we model? It's a very conservative approach. First, this individual -- we assume that the individual's home is now built here at the Saltstone Facility. This individual must be independently wealthy because he doesn't work, he stays here all the time. He doesn't -- he recreates at home, he stays at home, he doesn't travel. He's a man of the earth here.

As far as scenarios go, we're looking at direct ingestion of well water. We assume he drills his well right down below and he drinks all of his water from there. He ingests the meat and the milk from the livestock that also drink that water and eat that vegetation that is watered, the vegetables grown in the garden are irrigated with the well water, the milk and the meat from the livestock, again, eat the fodder, they eat the vegetation that was irrigated with that well water.

Direct irradiation from any recreational activities that would include swimming, boating, fishing in any of the -- where the water is available. We consider the shower exposure, just every way that you can come in contact with that water is considered in these performance assessment scenarios. Very, very conservative approach.

This is a diagram of the conceptual model that was used in the performance assessment for the Saltstone Facility. The parameters are inputs and assumptions that are used for each of these parameters -- these are all individual parameters that are modeled in models -- were derived from the scoping meetings that were performed.

There are two types of models, deterministic modeling, or PORFLOW. This is a model where it looks at discreet values. You take your best estimated values, put them in, it does a very, very complex analysis and comes out with a single number at the end of a projection.

The other type of modeling is probabilistic modeling. This looks at ranges of values and explores what happens as you vary the ranges of different parameters in different directions at those times. Through the course of our modeling we ran over 30,000 different realizations trying to vary all of the parameters and understand the implications of different ones working against each other or with each other.

In addition to running 30,000 realizations, those were not all run using the same case. George Alexander talked about base cases and alternative cases. A base case, DOE's base case is what values are expected, or in other words, what are the most probable values for each of those inputs and parameters.

The probabilistic analyses look at the range of possibility, how wide could they possibly be, and vary those across that range of possibility. In addition, the probabilistic analyses look at some very non-mechanistic assumptions, things that we can't physically figure out how it could happen, but we want to vary them that much to understand what the system is sensitive to. You want to find those parameters that are important so those are the ones you focus on controlling.

The probabilistic analysis is used to inform the deterministic analysis with the result of the deterministic analysis being that value that we use to compare for our compliance with the performance objectives.

I talked about being very fortunate by the very detailed characterization of the geological properties. We're also very fortunate in that we have the presence of a national Lab on site. This lab has over 50 years of experience in support of our direct activities, extremely knowledgeable and nationally recognized experts in the fields of cementitious materials.

And, in fact, some of the national -- Savannah River National Lab personnel chair other groups such as the Cementitious Barriers Partnership, so they are nationally recognized, and have been also called upon internationally to work on issues regarding cementitious materials. Also experts in geochemistry, hydrogeology and the actual modeling codes for environmental transport.

Between the 1992 PA and the 2005 special analysis we have implemented a number of improvements in the 2009 performance assessment. In particular, saltstone hydraulic properties. George Alexander talked about the use of the E to the minus 11 values.

We have in the 2005 performance assessment used values that are two orders of magnitude, more pessimistic than the 2005 evaluations because our research and development showed us that we -- those were more appropriate as our pessimistic -- or more appropriate as our assumptions.

We've performed extensive testing to understand site-specific conditions in the original performance assessment. We had to rely very heavily on literature data and extensive testing has been performed. It's not as much testing as we want to have, but it is testing to give us site-specific data rather than relying solely on literature values.

And this testing has been done both to characterize the Vaults 1 and 4, and in this case both the 1 and 4 walls as well as for the future disposal facilities, and again, for all of our expected final solidified saltstone. We've done other saltstone property testing looking at formula specific -- this would be grout formula specific in terms of what is the best formulation of the grout for the most durable long-term product.

The fracturing of the vault walls show you a little bit more information on how we modeled those. We did assume that the Vaults 1 and 4 were significantly fractured, in other words not a barrier to flow, and we assumed that the vault walls had a very high inventory present in the initial conditions.

It reflects the known conditions of the weeping walls of Vault 1 and 4. The concrete vault walls were modeled as severely degraded. In fact, they were modeled as rubble, with large pore spaces and significant flow. The flow that was modeled for the vault walls is four orders of magnitude greater flow than even the surrounding soil structure, which means that it's 10,000 times greater water flow than even the surrounding soil. So they were modeled with a high flow.

In addition, all of the pore spaces, you can see in this diagram the pink color of the walls, we assumed that any available pore space was filled with salt solution, not just drain water or bleed water, but actual salt solution for the analysis of those particular vaults. That was not the assumptions for the future disposal cells since we do not expect them to have the kind of cracking that we see currently in Vault 4.

As far as technetium reduction and retention, we all recognize the importance and the critical nature of understanding the saltstone properties and minimizing the reduction -- or minimizing the releases of technetium 99. We have conducted formula specific testing to test that reducing capability.

As I said before, we have had some issues with some of the tests and trying to get something that actually preserves those reducing properties. We do have testing that has now been ongoing for quite a long time, and the test results will be available at the end of March, and we look forward to having a meeting as early as April with the NRC to discuss the results of that.

The Vault inventory was another area where we made significant improvements with the 2009 performance assessment. We had improved waste characterization data. At the time of the 2005 special analysis salt processing had not yet begun, and therefore the amount of dissolved material that could have been sampled and characterized was extremely limited. We have a lot more data now and improved that characterization in this performance assessment.

The inventory values are, conservatively, or assumed to be pessimistic for the radionuclides of concern. For example, we used a decontamination effectiveness factor the Actinide Removal Facility and modular control -- or for the Modular Caustic Site and Salt Extraction Unit, we used a value of 12 versus actual performance of about 200. So we were assuming pessimistic values for what would be going into the vaults.

We used bounding ratios to develop the initial inventories of the uranium 234 and thorium 230, and our actual inventory disposed to date, plus the projections that we're going to have through the time of filling of Vault 4, are validating that the assumptions for the radionuclides of concern were, in fact, quite pessimistic.

When I say they were pessimistic, to put that in perspective for you, the actual disposal of technetium 99 to date in Vault 4 is only at about 3 percent of the Class A Concentration Limit. The Class A Concentration Limit being the lowest radioactivity level classification in CFR 61. The 3116 legislation was written to address disposal of Class C and greater than Class C concentrations of material.

With over 75 -- with over 70 percent of Vault 4 filled, the thorium inventory is only at .28 curies versus an assumed inventory of 7.5 curies for Vault 4 in the 2009 performance assessment. The inventories for the Saltstone Disposal Facility are updated quarterly, they're posted on a public website that is shown in the slides here that can be accessed by the public. Our disposal actions have been very conservative when compared to the analysis prepared for the 2009 PA.

One last item to put the risk in perspective. We all seek to keep the exposure as low a reasonably achievable, and to minimize the curies that are disposed of at the facility. But to put it in perspective for you, the annual limit for radiation workers, as established by the federal government, is 5,000 millirems. That is a level at which there are no known health effects for the exposure of personnel that could receive that every year.

The average US citizen, from background radiation, receives 310 millirem every year, and when you add to that the average medical dose that we received, whether it's x-rays or diagnostic -- other diagnostic treatments, this is does not include actual treatments like for cancer, radiation treatment, but diagnostics and preventative medicine, the average US citizen now receives 629 millirem.

If you work in Columbia, South Carolina in a granite building, or in Washington, DC in a granite building, you'll receive significantly more than that. And if you move from South Carolina to Denver, Colorado, you'll receive significantly more there, again, by -- from the cosmic radiation associated with the altitude.

Of the dose limit to a member of public for the operations at Savannah River site today is 100 millirem. An individual could receive 100 millirem without any notification. The performance objective, both for the Department of Energy and as documented in

10 CFR 61 is 25 millirem. The dose from just flying across country round trip is 5 millirem, if you fly to Europe and back you'll get 10 millirem.

And what we're forecasting as a result of the disposal actions at the Saltstone Disposal Facility over the period of 10,000 years is less than 2 millirem. So I think it's important for everyone to realize how seriously the Department of Energy and the Nuclear Regulatory Commission take the charge to be very protective of the environment and of the public.

We have -- as I noted, we received the second set of RAIs in December. We appreciate the inquisitiveness, the thoroughness of the NRC review. We have not yet had the opportunity to sit down and discuss their concerns and our responses. We look forward to that.

We're very confident that we can resolve their questions and move forward with the approval of the performance assessment and be able to put our new disposal units online, and we very much look forward to that process. We respect and enjoy the technical interchanges that we have with the Nuclear Regulatory Commission.

At this point I'm going to turn it back over to Pat to summarize.

MS. SUGGS: Thank you, Ginger. An excellent job as always of making complex concepts easier to understand.

Our approach to addressing NRC's request for information on the Saltstone performance assessment, this past July we responded to NRC's first round of requests for additional information, and they had provided those to us in April. And currently DOE and our contractor, SRR, are working contract actions to incorporate the work needed to address the NRC's second round of requests for additional information, which we received mid-December, this past December 15.

Following that we'll continue to work with the NRC and with our state regulators in public meetings if -- wherever possible, to cover certain things that we have discussed a bit earlier, to cover the latest research on technetium reduction. We expect that research to complete at the end of the March.

And to show that it is, in fact, supportive of our 2009 PA assumptions, we would like to categorize with the NRC to our mutual satisfaction the relative priority of the RAIs to be resolved to those that need to be addressed in the near term versus those that can be addressed in monitoring plan actions and as part of the PA maintenance process.

And also, because the modeling runs are very time intensive, take weeks of computer time, we would want to work with the NRC to come to an agreement on what those parameters ought to be in any additional modeling runs, in the same concept that a carpenter will tell you measure twice, cut once. We'd like to come to agreement on what the parameters ought to be before we make the runs and then not have to repeat any more than once, just to make one run.

So we want use that approach, working with the NRC and our state regulators to maximize our efficiency and to minimize the schedule impacts to finish resolving the NRC's requests for additional information on the performance assessment.

In summary, DOE feels that we have a robust process for developing, reviewing and approving performance assessments. DOE uses a risk-informed process to select key model parameters, and is committed to continuous improvement through research and development. We use probabilistic analyses to understand the model parameter sensitivities and uncertainties and importance.

And we do appreciate the thoughtfulness in reviews by the NRC of our performance assessments, and their -- look forward to continuing to work with them. We feel confident that our upcoming discussions will help provide satisfactory responses to the NRC questions.

And we're working to complete decision pertaining to the new Saltstone performance assessment underway to allow disposal operations at the new disposal cells in the middle of 2012.

Do you --

MR. SUBER: Okay.

MS. SUGGS: Do you want to handle -- ask for questions, Nishka? Okay.

MR. SUBER: Well, yes. Thanks, Patricia. Appreciate that.

(Pause.)

MR. SUBER: We'd like to thank DOE and NRC for their presentations. And does anyone have a specific question for Pat or Ginger at this time?

(No response.)

MR. SUBER: Does anyone on the phone have a question for DOE?

FEMALE VOICE: I do not.

FEMALE VOICE: Neither do I.

MR. SUBER: Okay. Great. Well, we're

going to open up the floor for questions for the NRC or DOE, or for any comments that any members of the public would like to make at this time. We just ask that when you come to the mike you state your name first, and then make your public statement or public comment.

Is anyone interested in making a public statement or public comment?

(No response.)

MR. SUBER: Going once. Going twice. This is your opportunity. We've got an open mike here tonight.

MALE VOICE: Karaoke?

FEMALE VOICE: But no karaoke.

(General laughter.)

MR. SUBER: Yes, no singing. I won't try either.

Seeing that no one is eager to make any statements, I would like to open the floor to any DOE manager who would like to make any closing remarks.

Would you like to?

MR. GUTMANN: Thank you, Greg.

I'm Tom Gutmann, Director of the Waste Disposition Programs Division with the Department of Energy.

And I'd like to express my thanks to the NRC for the hard work that they're doing to help ensure that the work that the Department is doing at the Savannah River site will indeed be protective of the public and the environment. We're confident that we have ensured that, as has been presented tonight ably by Pat Suggs and Ginger Dickert.

We appreciate the efforts of our liquid waste contractors, Savannah River Remediation, who is performing this work in cooperation with others in support from Savannah River National Lab and others.

And we look forward to completing, in the spirit of what Pat proposed, working with mutual respect for our mutual responsibilities and trying to achieve the most efficient path to meeting the Department's interests in remediating waste at the Savannah River site as quickly as we can, to reduce the hazard to the public and the environment, and also to meet the NRC's responsibilities in their monitoring role overseeing our activities. So thank you very much.

MR. SUBER: All right. Thank you.

Once again, we'd like to reiterate that there are handouts on the back table. There's also an NRC feedback form. We'd like to know how we did tonight, is there something that we could have done better, or if there is something that you'd like to see in the next meeting.

Someone mentioned earlier that they appreciate the fact that the meeting was here in Aiken, so information like that is helpful to us as we're trying to decide how to design our next round of public meetings. So feel free to sign up --

Yes, Linda?

FEMALE VOICE: You want to mention that all the presentations will be on ADAMS?

MR. SUBER: Right. And all the presentations -- that's a very good point -- all the presentations, including the transcript of this meeting, will be available publically through the NRC's ADAMS information system, and there's a pamphlet in the back which gives directions on how to actually go into ADAMS and sign up to get in the account.

Did I forget anything else, Nishka?

MR. DEVASER: No.

MR. SUBER: Okay. Well, I'd like to thank my staff here and I'd like to thank our counterparts at DOE and SRR for this presentation. And I wish you all a good evening.

(Whereupon, at 7:40 p.m., the meeting was concluded.)