

Official Transcript of Proceedings
NUCLEAR REGULATORY COMMISSION

Title: Information Meeting on NUREG-1757,
Volume 2, Rev. 2, "Consolidated
Decommissioning Guidance,
Characterization,
Survey, and Determination of Radiological
Criteria, Final Report"

Docket Number: (n/a)

Location: teleconference

Date: Tuesday, October 11, 2022

Work Order No.: NRC-2103

Pages 1-70

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INFORMATION MEETING ON NUREG-1757, VOLUME 2, REV. 2,
"CONSOLIDATED DECOMMISSIONING GUIDANCE,
CHARACTERIZATION, SURVEY, AND DETERMINATION OF
RADIOLOGICAL CRITERIA, FINAL REPORT"

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TUESDAY,
OCTOBER 11, 2022

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The meeting convened via Videoconference,
at 12:30 p.m. EST, Sarah Lopas, Facilitator, presiding.

STAFF PRESENT:

SARAH LOPAS, Project Manager, Medical Radiation
Safety Team

SHAUN ANDERSON, Chief of Reactor Decommissioning,
Division of Decommissioning, Uranium Recovery, and
Waste Programs

CYNTHIA BARR, Senior Risk Analyst

SHELDON CLARK, Office of General Counsel

RANDALL FEDORS, Senior Hydrogeologist

DAVID ESH, Senior Risk Analyst

MICHAEL LaFRANZO, Senior Health Physics Inspector,

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Region III

CHRIS MCKENNEY, Division of Decommissioning, Uranium
Recovery, and Waste Programs

LEAH PARKS, Risk Analyst

ASHLEY ROBERTS, Deputy Director, Division of
Decommissioning, Uranium Recovery, and Waste
Programs, Office of Nuclear Material Safety and
Safeguards (NMSS)

P R O C E E D I N G S

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(12:30 p.m.)

MS. LOPAS: Welcome to the U.S. Nuclear Regulatory Commission's public information meeting on NUREG-1757, Volume 2, Revision 2, Consolidated Decommissioning Guidance, Characterization, Survey, and Determination of Radiological Criteria, Final Report. My name is Sarah Lopas, and I'll be facilitating today's meeting.

This is an information meeting today with a question and answer session after NRC and NEI presentations. The purpose of this meeting is for NRC staff to meet with individuals to discuss the revisions to NUREG-1757. So attendees will have an opportunity to ask questions of the NRC staff or make comments about the NUREG revisions.

However, the NRC is not actively soliciting comments towards regulatory decisions at this meeting. So in just a moment, I'll be handing the meeting over to Ashley Roberts who's the deputy director of the Division of Decommissioning, Uranium Recovery, and Waste programs in our Office of Nuclear Material Safety and Safeguards. But before I do that, I do want to run through some of the logistics of today's meeting.

This is a hybrid meeting meaning that the

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NRC is hosting this meeting here in person in Rockville.

And we have a couple people joining us here in the room. But we're also hosting it through Teams as well.

So we'll have people joining us via Teams or calling in via the Teams bridge line. Everybody that's joined us remotely is pretty much right now in participation or listening mode only. That means that their microphones have been disabled for the moment.

When we do get to the question-and-answer session, I will be enabling people's microphones. And I have gone ahead and enabled some folks -- some people's microphones ahead of time based on feedback from people in the room here. So if you are one of those folks that has your microphone enabled, just keep it muted for now until it's your turn to speak.

If you've called in to the bridge line, you're also muted as well. And you'll be able to press star-5 when we get to the question-and-answer period.

And then I'll guide you through how to unmute yourself.

But essentially, it's pressing star-5 and then star-6 to unmute your phone.

We also have a Teams chat today. So the chat is open. You can use that chat to communicate to me or other NRC folks if you're having technical issues on your end.

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You can also submit shorter questions or shorter comments via chat. And I'll read those aloud is that's easier for you. I'm happy to do that. But try to keep the questions or comments short because the chat gets a little cumbersome if you submit paragraphs and paragraphs of text.

So next slide here. So today during the meeting if you have any issues with the Teams, I recommend a couple things first. If you're having issues with your Teams, close out of Teams completely.

Completely log out of it, shut it down, shut your browser down and rejoin using the same link you joined.

The other thing you can do is you can try to call in and let me go back to the phone number on this previous slide. If you have a pen or pencil handy, if you're having issues with teams, you can always call 301-576-2978. And the conference ID is 572 373 119.

That's the information up on this slide right now.

Let's see. I also wanted to noted today that this meeting today is being recorded by a court report. And I'm just about to start the Teams meeting recording as well. So the NRC staff may be posting a video of this meeting.

The transcript will definitely get posted for sure. But they'll also be posting a video of this

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meeting presentation if there's interest in that. And I think with that, that's all I have for my opening script. So I'll hand it over to Ashley Roberts.

MS. A. ROBERTS: All right. Thank you, Sarah. Thanks for kicking us off today. So I want to welcome all of you to our information meeting on NUREG-1757, Volume 2. I'm pleased to say that after this multi-year effort, it was just published in the Federal Register on July 22nd.

As Sarah mentioned, I'm Ashley Roberts. I'm the deputy director for the Division of Decommissioning, Uranium Recovery, and Waste programs here at the NRC. This meeting is part of a continued series of public meetings we've had and workshops that we've had on various topics of interest for decommissioning licensees and stakeholders.

For example, we had a public meeting in March 2021 on this draft NUREG and solicited comments for members of the public after issuing the document for public comment in December 2020. Since the guidance applies to all types of licensees, we received over 200 comments in the final version -- that we've addressed in the final version for both materials and reactor licensees. We presented information on guidance updates in various forms, including two

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regulatory information conferences in 2021 and 2022, two HPS annual meetings, a waste management symposium and others.

We've also held two subsurface workshops.

The first was in July of 2021 and nearly 200 people attended that and the second in May of this year with over 120 people participating. We're also scheduled to have a hybrid discrete radioactive particles workshop on November 3rd, 2022, and we expect there will be interest in that -- a similar interest in that as well.

NRC invests resources to develop this type of technical guidance with both the intent to make the NRC reviews more effective and timely as well as to support consistency and enhanced quality of the licensee submittals. And we thank you all for your continued interest in this. We appreciate that there has been significant interest in our decommissioning guidance.

And we really do value the stakeholder feedback and look forward to continuing to interact with you in these forums, today's meeting and others in the future. So we will continue to work with our stakeholders after this meeting to address technical challenges including survey and dosimetry

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considerations for the discrete radioactive particles and development of that subsurface guidance as I mentioned earlier. And then lastly before I turn it over to Cynthia Barr for our opening presentation, I want to invite you all to explore the What's New in Decommissioning public website that was developed to keep everyone informed of opportunities for public interaction.

I think Cynthia or Sarah might be dropping that in the chat. And just generally, it keeps you updated on what's going on in the program that was the effort developed in the last year or so by our team.

And it's pretty good at providing you some information.

And with that, I just want to thank Cynthia Barr and the rest of the great NRC team for all the work they've done for this interaction, this 1757 NUREG, but also just all of the different guidance documents that I've mentioned for a really great team.

And I really appreciate working with all of them. So thank you, Cynthia, and I will turn it over to you for opening presentation.

MS. LOPAS: Let me just pull up the slides, Cynthia.

MS. BARR: Okay. So I'll be presenting

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on NUREG-1757, Volume 2, Rev. 2, guidance revisions.

And this is a public information meeting, so we'll have a couple of presentations from NRC and NEI. And then we'll open it up for question and answer after that.

MS. LOPAS: Okay. We're all set.

MS. BARR: Next slide, please. Okay. So we've updated two of our key decommissioning guidance documents, NUREG-1757, Volume 2, which is NRC's primary technical decommissioning guidance document for both complex materials and reactor sites. We also updated with our federal partners NUREG-1575, a Multi-Agency Radiation Survey and Site Investigation Manual, or MARSSIM.

Both of these guidance documents address radiological surveys, surface soils, and building surfaces. NUREG-1757 also discusses dose modeling to drive cleanup levels as well as touching upon surveys of subsurface. The documents have not been updated in about 15 to 20 years.

So obviously, there was a lot of work that needed to be done just based on technological advancements as well as lessons learned. I want to focus on NUREG-1757. But I know you're curious about MARSSIM. So I'll also be providing an update on

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MARSSIM as well. Next slide, Sarah.

Okay. So before we get started, I wanted to introduce the members of the workgroup. This was a multi-year effort, and we've had staff come and go.

The current workgroup group is listed here on the left.

And Greg Chapman is our senior health physicist on the team. Sheldon Clark is with our Office of General Counsel. David Esh is our senior risk analyst. Randall Fedors is our senior hydrogeologist. Leah Parks is a risk analysis, and Adam Schwartzman is also our risk analyst on the team.

And last but not least, we have Michael LaFranzo. He's a senior health physics inspector out of Region III. Unfortunately, Greg is not available today, so we'll just make due the best we can without our senior health physicist.

But we do have in the room David Esh and Adam Schwartzman. And although Adam is not speaking today, he did do a lot of work on Chapter 5. And I just wanted to recognize that because even though it was not a lot of new content, it's reorganized in such a way that I think it's a lot easier to read. And he did work on some other sections as well. We also have remotely Randy Fedors, Leah Parks, and Michael LaFranzo. Next slide, please.

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Okay. So this slide just gives a little bit of background on where we came from with respect to the public comment period and the current status of the documents. So on NUREG-1757, Volume 2, Rev. 2, we received over 200 comments and 9 comment letters as Ashley mentioned. And I just wanted to acknowledge those comments because this is a 550-page document.

And so I know it wasn't easy to review.

And we really did get some great comments. It took us a lot of time to address those comments in a 100-page comment response document. But it greatly improved the quality of the final document. So I just wanted to take the time to thank everyone who commented on the report.

And I did also want to note that between the draft and final, we have vertical hash marks in the margins. So those just note the changes between the draft and final. They're not the changes that were made in the draft. But that will also show you or give you a hint on how your comments were addressed.

The final report was issued in July of 2022. And the Federal Register notice announcing the availability of the final report also went out in July.

And if you go to that Federal Register notice, you'll get all the ADAMS Accession Nos., all the documents,

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the regulatory analysis documents, the final document, and the comment response document.

Now with respect to MARSSIM, NUREG-1575, Rev. 2, that was issued back in July of last year. The comment period ended in February. And on that one, we received over 60 comments and 17 comment letters.

The document was also peer reviewed by the EPA science advisory board. They actually wrote a 100 page report. So it was quite substantial. It was finalized in February.

So our contractor, SC&A, and the working group have parsed out all those comments. And we're going through all the public and SAB comments to get the document finalized which probably will not be done until mid to late next year. And because it's a multi-federal agency document, it's going to have to go through internal reviews.

And it's a time consuming process to be able to review and sign those documents by the four agencies. So it's likely not to be published until 2024 realistically. Next slid, please. Okay. So this just provides a roadmap for our consolidated decommissioning guidance.

And you might be wondering why I never need a roadmap because I already said the document was done.

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Well, it is done, but we're never done. We're always trying to improve our guidance documents.

And we did receive a couple of comments on NUREG-1757 and MARSSIM on the need for additional guidance on subsurface surveys and discrete radioactive particles. So starting on the second row of the timeline, you can see we did hold two workshops as Ashley mentioned on subsurface investigations. The first one back in July of 2021 and then the second this year May 2022.

We were able to incorporate information from the first workshop into the final document. But the second workshop was not completed in time in order to make it into the final document. We also have additional contract work including the final SC&A contractor report which was completed two weeks ago.

It is linked in that's What's New in Decommissioning website as well. So we need to incorporate the workshop findings, the contract work.

And we actually have just kicked off a new contract looking at surveys of open excavations and reactor substructures.

And so that will address some other comments that were received on the report as well. So due to the breadth of the revisions, we thought that

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it was prudent to publish that interim staff guidance for stakeholder review and comment prior to us incorporating it into the next revision of NUREG-1757 which will be Revision 3. And we're also holding that discrete radioactive particles workshop on November 3rd and determining the need for additional communications or guidance in that area as well. I think I'm ready for the next slide.

So as far as major changes to NUREG-1757 and the dose volume area, we did include new guidance on methods to reduce conservatism when multiple elevated areas are considered. So if you can imagine having three or four elevated areas and applying MARSSIM equation 8-2 which would ask you to sum up the doses from each of those areas as well as the overall survey unit, you could get very unrealistic occupancy factors much greater than one. So we have some tips and tricks in the guidance document on how to reduce the conservatism when you are considering multiple elevated areas.

We also included update and new guidance in Appendix J about exposure scenarios for buried residual radioactivity, one of the types of scenarios that can bring that the radioactivity to the surface that might need to be considered. And we will be

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talking about that shortly. And finally, they will discuss the new Appendix Q which was added to the guidance document.

And that provides technical considerations whenever you're performing a probabilistic analysis. And so even though it may seem complex in performance assessments more than it is in decommissioning, there are some really good examples and case studies on things to consider when you're performing a probabilistic analysis which many of our decommissioning licensees do. Next slide, please. So major changes to NUREG-1757, Volume 2 related to radiological surveys are listed on this slide.

The figure depicts updates to Appendix G which notes that MARSSIM again which is just for the surface can be applied to buried surfaces even if they're in the subsurface. So with respect to the number of samples and the classification of the bottom and sidewalls you could consider, it would be acceptable to use MARSSIM. As I said, we just kicked off a new contract to look at this problem in particular and see if we need to update our guidance in this area to provide more flexibility.

An alternative statistical test, Scenario B was also emphasized in Appendix G updates. And

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Scenario B can be useful in situations where you're trying to establish that the survey unit is indistinguishable from background. So it would be useful in situations where the derived concentration guideline level or the cleanup level is very low in comparison to background variability. We don't want a situation where you're having to cleanup below background, for example.

And finally, there's a new Appendix O on composite sampling which was added to NUREG-1757, Rev. 2 as well. And composite sampling could be useful when you have hard to detect radionuclides, for example, and you have very dense sampling designs. Next slide, please. Okay. So next, I wanted to summarize some of the significant comments we received on NUREG-1757 in the dose modeling area. We received a great comment about the added complexity, I think it was from the State of New Jersey, when multiple DCGLs are present.

And we do agree with that comment. It does get quite complex, especially for having to account for multiple DCGLs. So we did add text in that it'd always be acceptable to use the most limiting DCGL.

However, we do recognize that for certain situations where you really need to consider multiple DCGLs, especially if the surface and the subsurface

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aren't co-located or they're separated and it's easier to implement. And the figure on the right from our first subsurface workshop actually shows the importance of source thickness and depth on various pathways of exposure. So you can get really significantly different DCGLs depending on whether it's on the surface or on the subsurface.

Some cases, at least a good understanding of that is needed. In other cases, it might be necessarily to apply multiple DCGLs for cleanup levels.

We will be discussing some of the other comments in later slides.

But I also do want to point out the potential need for site-specific KDs or distribution coefficients because this parameter can range orders of magnitude for some elements. And the parameter distributions reflect a range of sites. It's not always clear that the 25th and 75th percentile would encompass the range at a particular site.

And so we're just asking for additional support, and there's various ways you can do that. It doesn't necessarily entail additional experiments. But just it's about applying that value and understand the site-specific information such as the soil, the mineral type, the groundwater chemistry, the

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groundwater quality that could influence that value. And make sure that you're not underestimating the dose based on your selection of that parameter value.

Next slide, please. Okay. So we also received a number of comments on NUREG-1757, Volume 2 and the radiological survey arena. And I'm happy to report again that we have the contractor looking at a couple of those comments on use of in situ object counting systems and survey of reactor basement concrete to supplement our guidance of subsurface surveys.

We're also again working on other areas of the subsurface investigations and guidance to address other issues as well and determining the need for additional communications or guidance on discrete radioactive particles. So other comments, we've got some great comments regarding survey methods. Documentation and subsurface screening values were addressed to the best of our ability in a comment response document and in the final guidance document.

Next slide, please. Okay. So next, I would like to turn it over to our MARSSIM -- I mean, our, sorry, NUREG-1757 working group to provide some examples of the guidance they worked on. And so Randy Fedors is our senior hydrogeologist. And he did a lot

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of great work on Appendix F. And so he's going to speak on those updates next. Randy? Is Randy unmuted?

MR. FEDORS: I should be unmuted now, and my camera should be working to at the same time. So I presume people can hear me.

MS. BARR: Yes. Good to go.

MR. FEDORS: Very good. Just these three bullets are the main updates that I see for Appendix F. And the first one was that the references in Rev. 1 from 2006 had many 1980s and 1990 citations that clearly there's been plenty of work since 2000 on many of these areas. And many of those preferences are getting down into the weeds a bit.

But it's useful for people -- for licensees that need to pick up for the more complex sites. A major change was a whole new section was added for the conceptual site model. And that's kind of consistent with the NEI guidance, 07-07, and the groundwater protection initiative.

And in particular besides adding the section and describing what CSMs are, conceptual site models, emphasize the link between the CMS and the flow transport modeling if needed for the site depending on site complexity and what those dose model inputs would need to be for a model like RESRAD. Two notable

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areas that were improved were expanded discussions on monitoring networks and the sampling frequency where sections were rearranged and combined and combined these two topics. And some of the comments that were received on some of those changes were we should get more specific and more detailed and more prescriptive and other comments said we were too prescriptive.

So in this section, we're kind of walking the fine line between what makes sense for laying out details of what's needed for monitoring networks and sampling frequency versus there's many site dependent factors that are going to influence both of those.

And then the other last point I wanted to bring up with groundwater modeling, there were comments about, well, we've provided too much detail on complex models. So there's context added where we really laid out what a graded approach would be. Simple sites without contamination, without complex geometry didn't need to go use some of the models that were discussed in our groundwater modeling flow and transport section.

But sites that had contamination and complex site characteristics like fractured bedrock had to go into more detailed modeling areas. So that's all I have, and I send it back to Cynthia.

MS. BARR: Thank you, Randy. I really

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appreciate that. I think Leah is going to handle the next slide. So I'll advance for you, Leah.

MS. PARKS: Thank you. You should be able to hear me and see me now. Can you see me?

MS. BARR: We can, yeah.

MS. PARKS: Okay, great. Hi, my name is Leah Parks, and I'm a technical reviewer in our division. I work on reviewing license termination plans and decommissioning plans for material sites.

And I'm also recently certified as an inspector for power reactor decommissioning plants.

So in Appendix J, we streamlined the guidance on consideration of buried radioactivity. And we also added guidance on intrusion events and exposure scenarios for large substructures such as backfilled basements. As you can see in this figure, the assumption is that the residual radioactivity remains on the concrete surfaces of the floors and the walls and that eventually it leaches through the concrete walls and floor and reaches the groundwater.

So that's your groundwater scenario that you're considering in addition to the specific intrusion events. Again, consideration of these scenarios is going to help inform the derived concentration guideline levels, the DCGLs. And what

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we're considering here are also natural processes like erosion that could bring residual radioactivity to the subsurface.

Erosion is not discussed in Appendix J.

But I wanted to make that point that those natural processes should also be considered. So for backfill basements, you can simplify the conceptual model some.

For example, assuming that all of the radioactivity is on the floor of the varied substructure. But however, if these implications might lead to excessive pessimism, then the licensees have the option of modeling the actual configuration of the residual radioactivity and the degradation of the cementitious materials. So for example, another simplification could be to ignore the fact that concrete is there and treat it as a layer of soil that doesn't have resistance to the flow and transport.

So, cases where this is excessive pessimism and you do want to model the actual configuration, you also have to consider the complexity and the uncertainty of these more realistic modeling -- more realistic processes and the modeling of those.

So in that case, the licensee should communicate with the NRC early in the process to ensure that a technically acceptable approach is developed for those

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more complex problems. So I'm going to be briefly discussing the well driller, and the large excavation scenario.

Next slide. So again, the well driller is where you assume that there's an installation of a well that intersects the contaminated concrete surface and that the contaminated drilling soils that are brought up are a mixture of the fill material as well as that concrete contaminated surface layer and a portion of the concrete below that contaminated surface layer. Again, you're going to be considering this in conjunction with the groundwater scenario too.

So the residual radioactivity that's not brought up with the well remains underground. And that eventually reaches the groundwater.

Next slide. So this guidance also includes a scenario for large scale construction or excavation given that after the site is released, this land may be reused for certain large scale construction projects. Here we're thinking high rise condos, parking garages that are fairly deep, or other large scale uses. So in this scenario, a portion of the remaining backfilled basement or all of it are brought up to the surface after license termination.

And it's assumed to remain -- the

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radioactivity is assumed to remain on the concrete to maximize the concentrations that are brought to the surface. So there's going to be mixing of the fill material and also mixing of the volume of concrete that's brought up. Note that this figure is for illustrative purposes only and it's not mean to represent a specific suggested geometry or what's acceptable for a scale of what would be brought up during such excavation.

So in this scenario, we're considering the dose to the construction worker, the facility worker, or another member of the public who may be exposed to the radioactivity that's brought to the surface and mixed with the other fill material or concrete. I'll note that there were comments that this seemed like a less likely but plausible scenario or a scenario that could be ruled out entirely for the release of such a site. And again, this is all considered on a case-by-case basis.

So arguments could be presented by the licensee of why such a large scale excavation is not reasonably foreseeable or why certain pathways are less likely but plausible or even implausible. But even under those conditions, we do use the results of such an analysis to help inform our decision making, even

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if they're not compliance-based. All right. Those are my slides. Thank you.

MS. BARR: Okay. Dave's going to take it on the next couple slides.

MR. ESH: Thanks, Cynthia. I'm David Esh. I'm a senior risk analyst. And in a previous life, I worked on the engineer barrier section of this document which we made some edits to but not whole scale revisions in this go-around. But this Appendix Q is new.

And our goal with it was to provide some information that mainly deals with the more complicated cases where people are dealing with uncertainty and numerous types of uncertainty. And the reason why it's primarily because the role of uncertainty really fits in the analyses and the action. So in decommissioning, you are taking actions of one kind or another.

You're characterizing. You're surveying. You're removing material and shipping it, and all sorts of activity takes place in the decommissioning process. Those actions are driven by primarily some sort of analyses.

Our decommissioning process is set up to allow you to do very simple analyses using screening values. That's kind of the elementary school

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approach. And you can then progress to a bit more complicated using RESRAD and D&D which I'd say is kind of the high school approach.

But then ultimately some cases and sites may be dictated by a more complicated approach, i.e., the graduate school approach which is the probabilistic modeling, site specific probabilistic modeling. Uncertainty is ubiquitous across all those different types of analyses that you may do in the decommissioning process. But it really starts coming into play in the middle, the RESRAD or D&D approach and then especially in the site specific probabilistic approach.

The diagram on the right here is something out of the guidance document that we tried to talk about different types of uncertainty and where they fit into the process. If you're in the decommissioning process, you might look at that internal loop and say it never ends. And then it might feel that way when you're in decommissioning.

But ultimately, our goal and your goal is to get into the decommissioning process and get out of the decommissioning process as quickly as possible.

So this guidance on uncertainty is attempting to do the three primary things on the left here: to provide guidance on the treatment and representation of

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uncertainty, to discuss the different types, the approaches to incorporate it, and the methods to understand uncertainty, and then include some definitions, general considerations, and review procedures.

And like I said, the uncertainty is not meant to necessarily apply the (audio interference) but it's there for people if they need it. And that was based on our experience that was developed over many years of looking at different decommissioning applications.

Next slide, please. Okay. There's some pictures from the guidance on the right here and just screen captured right out of the guidance.

There's numerous examples in there that are intended to convey different concepts based on staff experience. They're generic. And of course they would apply to those complex cases. But they may also apply to some simpler cases. So Cynthia mentioned the distribution coefficients and I think it was Appendix I. That raises its head very frequently in these decommission applications.

They span many orders of magnitude. They're derived by the geochemistry of the site and the mineralogy of the site and just have such a large

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range of variation that you're really shooting yourself in the foot if you're trying to deal with something that that's uncertain with a quote-unquote, conservative approach. It's going to lead you to taking much more action than is necessary and result in much more cost and time.

So that's where my kind of push for is that, yeah, you need to be smart about considering uncertainty. But uncertainty isn't a bad thing. It should be looked at as a good thing, especially if you do it right.

So we have different practical examples in there. And then we're always available to help licensees and agreement state regulators on the assessment of uncertainty these analyses. Cynthia, myself, anybody on the team area always available. Call, email us, whatever if you have a question that comes up because it can be hard to generate guidance on these sorts of things without it then begin applied and see where it needs to be improved.

So we're always happy to hear back from people, good or bad. Like, I tried to apply this and I can't read. It's terrible. Or I tried to apply it and it led to this problem and this step. We're always happy to try to get better. So we've like to hear that

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background from people. And that's all I had.

MS. BARR: Thank you guys very much. Now I'll be talking about some follow-up work and related activities. So we can go ahead and go on to the next slide.

Okay. So with regard to subsurface investigations guidance -- oh, I'm sorry. Yeah, you can go on to the next slide after that. So as we've mentioned, we've held two workshops to support development of guidance in this area.

The first workshop was held last year with over 160 participants attending. And the second workshop was just held this year. There were 120 participants attending.

So obviously, there's a lot of interest in this particular topic. Some of the things that we talked about at the workshop are listed on this slide including geospatial tools. And that's to optimize radiological survey design as well as to help with remedial decision making.

And then we also talked about dose considerations for development of subsurface cleanup levels. And we did get some of that information into our final document and the importance of elevated area in a subsurface. So we're still looking at that

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particular issue.

NEI groundwater protection initiative, NEI 07-07 including information about development of hydrogeological conceptual models was also discussed. And then we had PNNL come out, and they talked about non-invasive, innovative technologies for subsurface characterization such as electrical resistivity, tomography, and time domain electromagnetics. We had some really great presentations from Oak Ridge Associated Universities, lessons learned from independent verification activities.

And then we also presented a case study from Los Alamos site. SC&A as I mentioned just completed that final white paper. And it is available at that What's New in Decommissioning website that Sarah posted as well.

Next slide, please. So NRC staff has developed interim guidance based on our contractor reports. The subsurface workshop finds, particularly the second on that we didn't incorporate, and other independent calculation simulations. And that'll be in early 2023.

For example, the interim safe guidance will include additional information on surveys of substructures -- reactor substructures as well as

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evaluation of the use of RESRAD onsite for varied and saturated basement substructures. We did have some guidance in Appendix J. But we did get some questions about that, particularly when the source is in a saturated zone.

So we're doing some simulations, and we'll be providing additional supplemental guidance in that area. And then we'll also be providing hopefully on case studies on acceptable geospatial tools for subsurface survey design optimization and final status survey decision making. The interim guidance will be issued, as I mentioned, for public comment prior to incorporation into the next revision of NUREG-1757.

Next slide, please. So, discrete radioactive particles have also been at issue at some decommissioning sites. NRC has contractors looking at survey techniques and scanned minimum detectable activities for surface and near surface particles. We also have contractors looking at dosimetry methods appropriate from discrete radioactive particles, including calculation of (audio interference) dose and acute dose to the lung and (audio interference).

And our hybrid public workshop is planned for November 3rd to discuss technical issues related

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to discrete reactor particles which is linked at the bottom of the slide. But it's also linked on the *What's New in Decommissioning* website. You can go there, one stop shopping.

Next slide, please. So workshop topics are listed on this slide for DRP workshop. We will have a presentation from Bruce Montgomery who's with us here today. We will be attaching three technical reports to the meeting notice.

One of those reports is already attached, and that's an interagency agreement report on the use of VARSKIN to calculate acute internal dose. And we'll have Oak Ridge Associated Universities and renaissance code development contract reports attached prior to the meeting. They're expecting great interest in this workshop just as much as we had for subsurface, maybe even more.

So hopefully you guys are available on November 3rd, you'll participate. And a link to the meeting notice is provided again on the *What's New in Decommissioning* website.

Okay. So the final thing I wanted to talk about today was visual sample plan code improvements. Pacific Northwest National Lab developed a visual sample plan to help design and evaluate data from

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radiological surveys. We have a contract to update visual sample plan and a number of improvements to the code are listed here on the slide. The first set are related to Scenario B improvements.

And so we did actually already incorporate some of these changes including prospective and retrospective power curves and calculation of reference area variability using the Kruskal-Wallis test and ANOVA output from that to help the analyst specify some of the statistical test parameters. So we provided a little bit more flexibility on specification of the lower bound and upper bound of the grey region. And then we also had some comments from the Science Advisory Board on the quantile test parameters, the power of the test as well as allowing the user to specify the actual quantile and alpha error to calculate the critical value.

And that was based on proUCL team, SAB, and NRC staff identified issues. So we're making those improvements. And you guys might be interested to know that we're also trying to be responsive to industry needs.

And we're adding in tools for modern data logging systems without surveyor vigilance or with autonomous vehicles that continuously collected data

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with the GIS and radiological information. So being able to read that data in, visualize it, and analyze that data is something that we've been working on. And we'll continue to do so.

We'll add those tools to visual sample plan. And the scoping of the tools to facilitate subsurface survey design, we have multiple year effort to actually incorporate a variety of tools for subsurface investigations. And PNNL just completed two scoping reports, both for those last two bullets on continuously collected data and scoping subsurface tools. So we'll be issuing those final reports soon and then be working on those tools in the next few years.

Next slide, please. So I think we're right on time with the concluding slide; 1:10 I think was the end of our presentation. So we've doing pretty good.

NRC has recently updated our decommissioning guidance documents. Obviously, we're not done yet. We know we have a lot of work to do in the subsurface area as well as discrete radioactive particles.

And so we look forward to working with our stakeholders on those issues and getting comments on

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those reports and then folding that in to our guidance document eventually. So with that, I will turn it back over to Sarah. I think I'll hand it back over to NEI.

Thank you, guys.

MS. LOPAS: Just give me a moment to pull the slides up. Share them with Teams folks. Okay. We should be all set.

MR. MONTGOMERY: This is Bruce Montgomery with the Nuclear Energy Institute. I'm the director of decommissioning and used fuel. And I'd just like to thank the NRC for holding this meeting.

I know this meeting evolved out of some discussion that we had as comments were being wrapped up on Revision 2. And we thought it might be a good idea to have this dialogue to make that the industry is familiar with -- and other stakeholders familiar with the changes that have been made which are substantial. So I really do appreciate that.

And I think we should continue to have these sorts of meetings as NUREG-1757 continues to evolve as obviously it will as we continue learn. I love the theme about continuing to improve our regulatory guidance. And certainly, we're of the same from of mind where the guidance that we're developing for commercial nuclear reactors around license

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termination writ large is going to be following the same kind of a pathway.

These two documents, NUREG-1757 and 1575, are very significant for us in our efforts. So we obviously want to stay very close. We're very happy to offer the comments that we did on NUREG-1757.

I know you thanked us for the comments we provided. But I wanted to express how impressed we were with the work you all put in, in reviewing each one and then answering, making changes as appropriate, or explaining the basis for not adopting a comment.

So many thanks for the extensive work that went into that comment resolution package.

We participated in both workshops for subsurface. And we're looking forward to the workshop on discrete radioactive particles next month. I think that one thing that we would need to do and we're about to get in and talk about the guidance that we're developing on license termination.

I think we're going to need to take a good look based on this presentation to make sure we've reflected these improvements and changes in NUREG-1757, Volume 2, Rev. 2 in what we are doing. And it'd become apparent why that's important that we do that as Gerry gets in to talk through the

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presentation we're about to give. So looking forward to it.

And again, thanks so much for this opportunity. And I'll turn it over to Gerry van Noordennen of Energy Solutions who is going to explain what we are doing with NEI 22-01, the license termination process. Thank you, Gerry.

MR. VAN NOORDENNEN: All right. Thank you, Bruce, and good afternoon. And thank you again, for giving us this opportunity to talk about the guidance document that we're putting together for the industry in this area. I am currently an executive consultant for Energy Solutions but continue to fill my past role as Senior VP at Reg. Affairs until my replacement takes over later on this year.

The first slide up here on the introduction, I want to make sure that everyone understands that what we're developing is an industry guidance document that focuses on form and content of the license termination plans and final status service reports. And it uses our industry experience to help inform plants to use the existing NRC guidance in this area. So I want to make sure everybody knows we're not trying to change NRC guidance but use it in a how to practical manner for people.

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So that's really the objective of what we're trying to do here. It also provides suggested process and improvements on how to work with the NRC and other regulators for review and approval of the LTP and the FSS report. As far as 1757, Volume 2, Rev. 2 guidelines and the guidance in there, this document consolidates that guidance specifically for the commercial and nuclear power reactors is what we focus on here and not so much the material licenses.

We provide many examples on license termination tasks where there's been success is obtaining NRC approval at previous and current decommissioning sites. And as I said, we provide suggested planning milestones in a schedule and stakeholder interface plan on how to promote transparency and efficiency in this process. Again, this is an example of really trying to incorporate industry lessons learned and best practices to be shared with the users of this document.

So it is an example of industry collaboration with each other. I'll also ask -- at the end of each slide, I'll ask if there's any questions from the staff before I move on. Are there any at this time?

Okay. So let's go to the next slide. After

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a lot of internal discussion in our working group to develop this document, we decided the best format and content was to follow the LTP format that's in the NRC guidance document. It's NUREG-1700. And so you'll see here the first eight chapters coincide with the outline that the NRC recommends for doing an LTP.

And then we added a final chapter on final status survey reporting. The important things to note here is that when we focus in a line on the final status survey reports, we're trying to use the objectives that are in the license termination plan and improve this process, especially coordination with headquarters staff, the regional inspectors, and independent oversight. So it's important to know.

Then what is important too is on the next slide on the appendix, this is where we really include the industry experience and propose process improvements. And so this is some of the things -- as I said before, this would be the license termination plan, content, consistency, and quality that is needed.

Also looking at the volume and types of final status survey data to support the NRC reviews, discussing the role of the independent surveys in the quality assurance programs.

Then also discussing the proposed -- as

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you see there in the regulatory interface plan looking at the communications between the licensees, NRC headquarters and the regions. We also include a schedule and provide examples of dose modeling experience that have worked in the past and also examples, characterization remediation and final status survey of groundwater. In the future as the NRC guidance continues to evolve, we'll probably add another appendix on discrete radioactive particles.

So you'll want this to be a working document that keeps up with the NRC guidance as it evolves. So again, maybe touching on the first application of advanced technologies, it's good to see that NUREG-1757 now is also starting to discuss this because there really is a need to look at automation of the surveys. And this is something that needs to be worked on both with the NRC and the industry in the future because there's a real potential savings there in cost and schedule.

Then the next slide is just a proposed schedule of where we are. We actually have a Rev. 0, and we're about to submit that for industry review. We've already reviewed that amongst the decommissioning working group and our working group incorporated those comments.

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Now we're going to a wider industry review.

And then we it'd be important to have a pre-submittal meeting with the NRC sometime in November time frame.

And Bruce will work with you on setting that date.

Then our schedule calls for us to submit this document to you for review and concurrence on December 15th along with a waiver request. Then sometime next year, I'm sure the NRC will have questions or RAIs will respond as needed. Again, I want to emphasize this.

We hope this will be a working document so that we continue to revise it as the NRC guidance comes out. The next slide shows the team that has worked on this document. And I've been fortunate enough to be the lead on this.

We started over a year ago on putting this document together. And you can see here that we have a diverse group of industry participating, including NEI with Bruce and also EPRI, Electric Power Research Institute. And this is important to show that it's not just a couple of companies or utilities working on this.

We tried to get a diverse group here. One thing to note is Jean Fleming, one of our members, she's going to be leading a team to improve the industry

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collaboration and coordination in decommissioning. So we've heard the NRC request on that through NEI responding to that request and taking action. Any questions so far? I know I'm going through this pretty quickly. So okay. All right.

MR. ANDERSON: I have a quick question.

MR. VAN NOORDENNEN: Yeah.

MR. ANDERSON: Shaun Anderson, chief of reactor decommissioning. You mentioned that you wanted the guidance to be a working copy, a working version that you all keep updated. So you're looking for NRC endorsement and a process to kind of work on and continue revisions through the year. Can you explain that a little bit more?

MR. VAN NOORDENNEN: Yeah, I think as the --in the initial review as guidance documents are issued next year, we'd like to incorporate them. And then once Rev. 0 is concurred on by the NRC, then as future guidance comes out --

MR. ANDERSON: Got it.

MR. VAN NOORDENNEN: -- then we would do a formal revision to this document. Make sense?

MR. ANDERSON: Yeah.

MR. VAN NOORDENNEN: Okay. Any other questions? Okay. Just some summary thoughts here.

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Success in decon is really important on the back end of the NRC's cycle to demonstrate that we have sustainability in the commercial nuclear industry.

And right now, we seem to be struggling in that area. And so it's important that the industry is focusing attention on this. And I know the NRC is starting to put attention on this too.

I think that's well placed. Progress, as we know, is being made on the front end with a proposed decommissioning transition rule with that emphasis.

And this is a start here along with your guidance work that you're doing to help improve to make that as transparent and reliable as the front end will be.

License termination, I always tell people that the hardest thing you're going to do during decommissioning is review and approval of the license termination plan at the back end. It really is true.

And that is technically the most challenging time consuming aspect of doing decommissioning.

And there's a lot of uncertainty now in this area depending on the complexity and the issues that come into play during decommissioning. So, again, this is something that needs attention, both with the industry and the NRC. And it's good to hear that NRC is focusing on those issues such as the dose

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modeling scenarios and subsurface soils and DRPs because those are issues where, for example, MARSSIM doesn't mention anything, talk about it.

And so there is a need for NRC guidance in this area and the industry to support that effort and to work with a product that provides clear, consistent guidance for people in the future. So I think there's a strong bias here to close those gaps in the guidance. And this will also help serve the public to better understand what is happening on the back end because it's all very technical.

And you really have to be immersed in this on a day-to-day basis to understand what's going on.

You can't just read LTP and know what's going on. It's just too complex to understand in the first read.

So I think those are my thoughts. Again, one thing I know the NRC is working on. What we've seen as far as process improvements too is there needs to be sufficiency of NRC resources for the ongoing future LTP and FSS reviews.

And I know the NRC has been struggling with that now. But we understand that there's going to be improvements. So I know that's created some unnecessary delays as you try and move the staff from one project to another.

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But hopefully that'll improve in the future. So with that, those are all the comments I have. And then during our pre-application meeting, we can get into more detail on exactly what's in the document. But it's important to note that not only are we looking at the technical how-to but also the process to try and help improve and streamline that.

So with that, are there any questions, comments?

MR. McKENNEY: I'd just like to thank you, Gerry -- to just thank you for that presentation because, yes, the guidance we develop for us has to cover all of our licensees because everybody at some point enters decommissioning. And for the vast majority of licensees, that's the only time they're going to enter decommissioning hopefully. And they're not going possibly go through that again in their time.

So unfortunately it's not a very heavy area where we have learning. But for an industry, you can take that learning and transfer it across and taking that as an opportunity because, again, our guidance is going to cover a lot of cases that may not apply to your industry. And those are ones where unfortunately if someone doesn't have that background, they can get lost in those details and wonder why they're even focused on that issue when it's not a

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problem for their industry. And so a standard format content, the expectations document, whichever you want to -- a crosswalk as you said.

All are important things for an individual industry to think about to try to improve the efficiency of those actions. But we -- unfortunately for developing the guidance, we -- from day one in 1997 when we had those initial meetings between all the different industries to talk about what was decommissioned under the new rule, we did stress that we had to be a bit broad on our guidance to cover all of the cases and give at least some level of predictability to approach this for all areas. But that may not be the most efficient for anyone. So yes, we're looking forward to talking to you to hear more about it.

MR. MONTGOMERY: Yeah, thank you for that.

Bruce Montgomery here. And in a nutshell, you just define the whole reason behind the creation of NEI 22-01. So it's basically a further consolidation of authority there into a document that really focuses the user to user for the commercial nuclear industry because there's not a huge amount of variation site to site as you might -- as compared between a technical nuclear power plant site and some of these more complex

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material sites.

Gerry mentioned the idea of a pre-submittal meeting. And we would like to do that.

We think it would be a very good idea. We talked about it at the decommissioning working group meeting where Jean and the team attended.

We'd like to get your thoughts on what you would like to see or need to see to sort of clarify for you what we're going to be submitting for review since we understand these types of reviews are not inconsequential in terms of the resource requirement to support the payoff down the road. But we want to make sure that we submit something to you that you recognize as a worthwhile undertaking to commit to a review. So any thoughts you might have.

It doesn't have to be today. I could follow up after you've had a discussion. I can talk to Ashley and we can get a better view. We're looking at the week of November 14th as it might be a good time for us to sit down with you and work through what's going to be in our submittal and what the review process might look like.

MR. MCKENNEY: Yeah, we'll take that back to think about that. The benefits of pre-submittal meetings for anybody who's always trying to make sure

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that the vast majority of questions have been thought about by the applicant or been raised by us. We need to pull somebody else in. Obviously for this one, I think one of the ones would be -- I'd like to get somebody who could discuss to make sure that all the things are raised for your fee request right now -- your request to not have to pay a fee for the review.

MR. MONTGOMERY: That's correct.

MR. MCKENNEY: So I want to have somebody there for that so that we can make sure that you have covered the right levels of area that need to be addressed in that request before we get it because otherwise that's just a delay to get that additional information. If we can get that out, we'll similarly think about what level of detail are we going to get to in the actual document.

MR. MONTGOMERY: Yeah, thank you for that.

MS. BARR: I would say, like, a very detailed table of contents similar to what you've done here in areas that you think are most challenging that you would want us to work on or that you need additional input on or more input on I think would be helpful.

And any areas where you feel like there's still a lot of uncertainty in the process of getting a license terminated where -- so we can have a conversation, I

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guess, where additional NRC guidance would help down the road. This is going to be a living document, I assume.

And so as things are done and as we make advancements over time, we'll be able to fill it in and address some of those challenges. But I mean, I think it's a great start, and this is going to be a very exciting document and very helpful to the industry and kind of facilitate the overall efficiency of this whole process. So very excited to see what you guys have put together. Sounds great. And so I applaud you and your work on that.

MR. MONTGOMERY: As much as we're trying to consolidate, it's not going to be a small document.

So when we show you the detailed table of contents, you'll see there's quite a bit of detail in there, what we think is appropriate. I think we've already talked about some of the open areas.

They're still evolving that are going to have to be factored in as we go. But one of the things that we're including is a lot of past experience. And one of the questions that we're going to have as we go is to what extent does that past experience still apply.

And so that's going to be very instructive

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for us and we're going to have a lot of discussions around those, I'm sure. But that helps. I think that detailed table of contents with just answering questions on what's inside each piece. What we think might be controversial in terms of your review, that sort of thing. I think it would be good have a good -- we should carve out a good chunk of time to do this to make sure we're sending you what you need to see.

MS. BARR: I think that's great. And I appreciate the comment that we're still getting smarter and we're still trying to improve our guidance and do things better. And so as you said, there might be some precedence, and maybe there's precedence. Fine. But maybe there's other opportunities to make improvements in the process as well as we go forward. So those types of examples and that kind of information I think is going to be very valuable.

MR. MONTGOMERY: Yeah, no, we have some focus on the line who are going to ask you some questions or make some comments on things that we just saw in your presentation. But Gerry mentioned that we want to continue to focus on those things that are most consequential to public health and safety and protecting the environment. So I think whenever we get to something that's becoming complex, we're just

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not sure how to tackle a technical issue, we should always draw it back to, okay, how important is this particular issue to public and safety, no matter which way it goes because it may not be that big a deal from a dose perspective.

But for those that are, we should dig in, no question about it. No pun intended. I think -- well, let me just leave it at that. And since we're only 25 minutes left, let me turn it over to my team and Gerry's team to see what questions or comments might offer over the phone.

MS. LOPAS: All right, everybody. This is Sarah Lopas. So if you're on Teams, just go ahead and use that raise hand icon. Just click on that once, and that will let me know that you want to speak to ask a question.

If you are on the phone, you're going to press star-5 if you're on your phone. So, okay, Sarah Roberts, you can go ahead and unmute yourself.

MS. S. ROBERTS: Thank you. Can you hear me?

MS. LOPAS: We can. And just one reminder for everybody. Just introduce yourself before you start speaking. That includes NRC staff so that the court reporter can keep up and people on the phone can

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keep up. So all right. Go ahead, Sarah. Thank you.

MS. S. ROBERTS: Thank you. Yes, this is Sarah Roberts with Energy Solutions. I'm also a member of the NEI 22-01 working group. I have a few questions on a few different topics related to the NUREG and one question related to the draft MARSSIM Rev. 2 since that was discussed briefly by Cynthia if I may.

So my first question has to do with the use of KD values, distribution coefficients. And Cynthia, you teed that up very nicely. I believe it was on slide 8 that licensees need to pay closer attention to the use of default values for KD values.

And I believe that's what I heard and how I interpret the NUREG.

But I have a few specific questions. And the first question has to do with the use of the default values, KD values, that are in the data collection handbook. That's the 2015 Argonne National Lab document.

And the first question is, does NRC consider any of the probability density functions, PDFs, in that 2015 document? Do you consider any of those to be acceptable for use in selecting a deterministic KD value? Or is it more of on a case-by-case basis?

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MS. LOPAS: Okay. So I'll go ahead and answer that. I know you had some more questions. And so we did sponsor development of the 2015 data collection handbook. And so it's not like we're saying that's not a valid source.

But the point is that the parameter distributions that vary by element are for basically literature values for all the information that they have or that they were able to find on that particular element, for example. And we found in some cases that the data that supported those parameter distributions was very sparse. I think maybe radium comes to mind.

It's probably not an issue for reactors.

But in some cases, the data was sparse. So obviously, if it's sparse, then it may not encompass the range of values for your particular site. But the larger issue with respect to the parameter distributions are that they cover all kinds of sites.

So then you get in a situation where you're talking about a parameter distribution that covers several orders of magnitude. And so just arbitrarily saying the 25th or the 75th percentile is appropriate for any particular site sometimes is not technically defensible. So we're just saying as you said, be smarter.

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Make sure you understand the data that went into those parameter distributions. Make sure it's appropriate for your site. It's not leading to risk dilution as mentioned in Appendix Q and that you considered your soil types, your geochemistry, the things that influence the KD value, the distribution coefficient for your site and that it makes sense and it's defensible.

And so it may not be an issue for a lot of the key radionuclides for reactors. In fact, that's one of the areas that we're putting in our interim staff guidance that we're developing next year to look specifically at the parameter distributions for key radionuclides for reactor sites and evaluating the range of uncertainty, the appropriateness of using those parameters and what kind of drives what the value would be. Like, for certain radionuclides, for example, pH may drive or be one of the most important things.

For other radionuclides, it's just the parameter distributions are much more certain and it's better known what they should be for a particular site.

And so we will make that effort. And that's, again, something that we're going to include in our staff guidance.

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Hopefully, that answers your question. Does anybody else have anything add from the staff? Sarah, did that answer your question?

MS. S. ROBERTS: It did. I do have a few follow-up questions if that's okay related to KD. And you stated and you just reiterated that it's not necessarily an expectation that a licensee would perform additional experiments. I think that was the word you used to determine site specific KDs.

But I believe what I'm hearing is just provide justification, whether it be from literature or a written justification that's scientifically based, technically based and not necessarily go right to performing collecting samples to determine KD via a laboratory. And that question is pertinent because just the expense of doing the analyses to determine KD could be very costly as you are well aware. Yeah, so any clarification around that would be very helpful to the licensee as far as what's considered acceptable or not.

And the next question I have related to KD has to do with the language that's in the NUREG related to sensitive KD and significant dose. Of course, insignificant to be defined. Could you provide any additional information or comment on when

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doses will be considered significant or insignificant in this context?

MS. LOPAS: I think it's easier to say when it's insignificant. And we can use the 10 percent rule for that. When it becomes significant is probably a little bit harder to define. But once it starts becoming -- and I think for most of the reactor sites, there's only a few radionuclides that are really driving the dose.

And the uncertainty on some of those KD values may be very low. And so again, we want to look at that. So before you do a lot of work on trying to experiment to get site specific values, I would encourage you just to talk to your reviewers, the NRC staff. And we can provide you more feedback and guidance on that. So it really just depends on the radionuclides that are driving the dose for your particular site.

MS. S. ROBERTS: Okay, very good. And as the staff is aware, there are some LTPs that have been submitted in advance of the NUREG Revision 2 being finalized and issued. But I presume that would still be an expectation to apply the Rev. 2 guidance for LTPs that have already been submitted.

MR. MCKENNEY: No, I would not -- this is

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Chris McKenney, NRC. I would not withdraw or anything like that to revise them in any way. We'll try to risk inform our RAIs by looking at that issue to see whether, again, if those radionuclides are not causing much sensitivity due to KD selection, then there may be -- that may not result in an RAI on those specific cases.

So we'll look at that issue. Again, we're putting out that you can just use the broad source of everything from sand to clay types of KDs and just start a probabilistic analysis over that to try to find the sensitivity because it can cause some problems. But if you can refine it down to some soils that are more similar to yours, whether it's sandy or silty, that really condenses the range.

That may be one of the approaches that you'll be able to use at least at first cut and then find how important it is to your results in the probabilistic analysis to say, okay, do I really need to get more information to make a deterministic value?

Or do I use mean of this distribution and it does not really cause a problem? And then you could discuss that as your justification. Similar on the other approach when we developed RAIs, we're going to be looking at the sensitivity first before we come and just say, oh, well, it's not similar to the NUREG-1757

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Revision 2. So we'd like to have more justification.

MS. S. ROBERTS: Thank you. And those are all the questions I have on KD. I do have a question related to submittals, in particular, final status survey related submittals, the reports, release records. And I appreciated Ashley's comment about the objective of providing guidance to ensure more consistency and enhance quality of submittals from licensees.

And that's something we're very conscious of on the licensee side that we need to improve the quality of submittals. I have a specific question related to the size of the submittals and expectation of content. Notwithstanding the NUREG section 4.4 and 4.5 which describes the minimum information to be submitted for -- related to FSS design and also reports.

It's difficult as you could imagine to find the balance between submitting too much information and not enough. And we're very sensitive to the fact that if we send in a 3,000 page document, it's going to be very time consuming and require a lot of effort on the part of NRC to perform reviews. So I have a general question related to opportunities to perhaps reduce the size of the submittals.

And in particular, I would point Section

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4.5.1, .2, .3 in the NUREG that has the criteria for selecting survey units for more detailed reviews. And in particular, the words risk significant issues, I'm focusing on those survey units for more detailed reviews. And so on the licensee side, we would like to utilize that process more to reduce the size of the overall submittal and perhaps ask NRC to -- if more information is requested for specific survey units, that would be on a case-by-case basis. So that's the general questions/comments. If anybody cares to respond.

MR. MCKENNEY: Chris McKenney. Yeah, that would be a -- again, we'd wouldn't be working from a risk informed point of view. We're going to be looking for summaries of every survey unit. But we don't need the detailed data or level of detail should be relative to probably the class and others. We have -- of course, we have our oversight abilities. And also if we need more information we have multiple ways to have that discussion with you including coming to the site and looking at some of the data directly.

And then deciding that maybe because of the data, because of the risk significance of this survey unit that wasn't expected originally, they were going to have to ask for more detail on that survey

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unit. But I would really expect that we hopefully will be able to get solid ground and maybe for the industry.

Hopefully, that'll be something coming through with the NEI's report to try to give us a place to put a flag in the ground to say here's some examples of approaches and considerations for the level of detail.

MS. S. ROBERTS: Thank you, Chris. That's very helpful. Appreciate it. I had one more question related to the MARSSIM. But I'm not sure if that's something you would like me to ask during this meeting. So I can table it if you prefer. I see we're running out of time.

MS. BARR: Does anybody else have any questions?

MS. LOPAS: Yeah, let's -- we'll put a little -- I'll call out. It doesn't look like anybody is calling in on the phone. So just raise your hand.

We've got a couple popping up. So Sarah, we'll come back to you if we have time on that. Let's go to Jean.

Jean, you can go ahead and unmute yourself.

MS. FLEMING: Great. Thank you. Good afternoon. My name is Jean Fleming. I'm with Holtec Decommissioning. And I have a comment more than a question.

So we're actively developing at Holtec for

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license termination plans as we go through decommissioning of our sites. And I just want to express the sense of urgency that we feel to establish a clear path forward with the license termination plan.

We're in different phases of development of the license termination plans. And to have clear guidance is going to be paramount to ensure that we have a quality submittal that has all of the requirements of Rev. 2 as well as the NEI document 22-01 for license termination plan. Thank you.

MS. LOPAS: Thank you, Jean. Eric, why don't you go ahead and unmute yourself and introduce yourself, please.

MR. DAROIS: Thank you. This is Eric Darois. I'm a CHP and founder of RSCS, Inc. and been supporting several of the decommissioning sites in respect to FSS and LTP development.

I really have just a couple of comments. One is on conservatism and modeling and our whole approach. And the other is just a little bit on advanced technology.

So I'll try to make it brief in the interest in time. I just wanted to bring out the level of conservatism that we apply. And it seems that we apply this in multiple places from dose modeling to our

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approach for final status surveys.

A lot of site I should say defer to a resident farmer scenario, for example, which is really quite -- it's almost less likely but probable these days. I spent a little time in the last week going over the agricultural statistics for the country. And most farms are large, almost industrial farms.

What we seem to model with a resident farmer is a homestead farm. And I suggest there's not enough land anymore in the U.S. to do that and much less the decommissioning site. But we carry the conservatism through how we approach our radionuclide mixtures so we can establish surrogate ratios so we can deselect radionuclides through the insignificant contributor process and so on.

So I don't know if anyone sat back and tried to risk inform all of this conservatism because it does compound through the process. I don't need an answer, but I just want to raise that as just something that appears to be just a lot of conservatism. And is it balanced? And I'll just leave that for perhaps a future discussion, unless somebody wants to address it before I move on.

Okay. Enough said. The last topic is advanced technology. Talked a little bit about

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advanced technology in you presentation particularly on the VSP slide and the improvements that are being made there. And I just want to leave you with the fact that no all advanced technologies are created equal.

We have data logging systems that you can use a single detector for scanning. We can use an array of detectors for scanning, all tied to geospatial locations and timing. Some systems are able to collect one second gamma spectrums through that scanning process with multiple detectors.

And then there's large surface monitors that can collect spatially oriented data. So there's a lot of variance on that. And establishing MDCs, although a lofty task, is not an insignificant task.

And to do it well, some of you know I've been down that road.

So just I'm hoping that when you do evaluate that, it attempts to incorporate all the different variations of advanced technology. And there's likely to be more as technology improves as we all know. So that's all my comments.

MR. MCKENNEY: Thanks, Eric.

MR. DAROIS: Yeah.

MR. MCKENNEY: There is -- yes, we're trying to make it flexible because again it's the new

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technologies, these new approaches or maybe not actually new but several years old that we just haven't included in the software programs or these other points of guidance. So we are trying to maintain a flexible first sort of approach rather than trying to stick it to only this technology or that technology or that approach if we can. I mean, again, you're trying to make software program that reads data.

So sometimes unfortunately you can only have so many variations. And on the other one, yeah, there's -- depending on how you take the conservatism -- take the approaches that we have in our system and you don't decide on site specific approaches yourself, yes, the conservatism can stack up quite a bit between the way that survey methodology gets created which was separate than the dose modeling approaches. But again, we're trying to cover a lot of issues that somebody might take site specific approaches as one or the other.

And so that there was a way for people to do it with having the first step approaches have to as least effort as possible to try to develop their sites and be able to show that they had very low levels of residual radioactivity, which in the vast majority of our licensees across our entire licensee chain, that

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does work for them. It may not work for the more complex sites because it does have a stack conservatism. That's where site specific approaches can then take over and make us start using which parts are beneficial to them and extend where they need to, the effort to try to make a better approach.

MS. BARR: Thanks, Chris. This is Cynthia Barr. I just wanted to add a thought about the scan, minimum detectable concentrations. First, we want to calculate those a priori to make sure that the detector has sufficient detection capability.

But we're also looking at a posteriori methods to calculate MDCs and getting -- considering local variability and background levels and getting lower MDCs. So that's an area of research that we've been working on for actually a couple years now. So if you guys have any things in particular that are challenging or that would benefit additional work or tools in this area, please let us know because we're actively working on that right now. So thanks for the comments.

MR. DAROIS: Thank you.

MS. LOPAS: Thanks, Eric. Rich, you can go ahead and unmute yourself, introduce yourself, and start with your comment or question. Rich, you just

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have to unmute yourself. You should be able to single click on your microphone icon.

MR. McGRATH: Can you hear me now?

MS. LOPAS: We can, yeah.

MR. McGRATH: Okay. I'm Rich McGrath with Electric Power Research Institute. Just really a couple of comments. Very glad to hear you're working on some practical guidance for showing compliance in subsurface area. I think that's something we really need.

But I guess I would mention one thing. I really don't see anything in the way of how to handle potentially contaminated bedrock. And it might be something you might want to look at that gap.

We will have some information on past experiences in our NEI document, the 22-01 on that.

And the second topic I would like to say is, also glad to hear you're looking at the scenario for something like reactor building basements. We think these type of basements are something that would be very hard to access.

Reactors are usually in pretty remote locations. Not the kind of place you're putting apartment complexes and that kind of thing. So I guess I'm glad to hear you're willing to accept some of these

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scenarios that are defined in a NUREG as potentially not plausible scenarios. So that's really just a couple of comments on those two topics. Welcome any questions back if you have any.

MS. LOPAS: I think we're good. So we are approaching 2 o'clock. Cynthia, did you want to go through any of the chat questions? Is there anything outstanding or that you felt like should be read aloud in the chat?

MS. BARR: Well, I wasn't sure if we addressed Janet's comment. So we tried it from a couple of approaches. We weren't sure she was talking about existing groundwater contamination experience of radioactivity or she was talking about some of the intrusion scenarios. So if we didn't answer your question, I'd invite Janet to unmute.

MS. LOPAS: I don't know if Janet is online anymore.

MS. BARR: She might not be because she didn't respond to any of the comments. And then Jenny, we don't have a firm schedule on Revision 3 of NUREG-1757 Volume 1. I suppose when it makes sense and we have enough updates to update it, we'll probably do that.

I mean, I suppose that subsurface is going

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to be quite substantial that maybe it would be prudent to go ahead and update it sooner rather than later.

But I can get back to you on that. Oh, yeah. Janet just responded, so --

MS. LOPAS: Okay. I just made her a presenter, but then she kind of disappeared. So he might've actually dropped off. I don't --

MS. BARR: Well, she did say thanks for responding. So I think we addressed --

MS. LOPAS: We're good? Okay. All right, great. That's all I saw, though. If I missed anything.

MS. BARR: Jenny Goodman was asking what is the schedule for Revision 3 of NUREG-1757 Volume 1.

MS. LOPAS: Oh, Volume 1. I'm sorry. I didn't catch the Volume 1 part. Volume 1 was delayed. And so I think the current schedule is the end of next year due to higher priority items.

MS. BARR: Did you want to do one last call for question or comment? Okay. All right. One last call, it's 2 o'clock. We do want to wrap up. But if anybody in the room here, obviously with Gerry or Bruce, or anybody on the phone has another comment. Just raise your hand. But I think if not, we will go ahead

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and hand it back to Cynthia or Chris to close out.

MR. MCKENNEY: So thank you all for attending today. I'd like to thank everybody who presented. And I'd like to thank my staff and team for actually getting the document done. It's been a long, long haul.

And, yeah, it's one of those -- it's something we can always have revised and could have been in Revision 2. But we need to stamp a place to have Revision 2 and put some of those topics for continuing work. NRC has other processes like interim staff guidance which we can continue to improve areas or whenever we do Revision 3, whenever we can budget that. It's a few years from now. But doesn't mean we're going to be sitting on our heels.

And so thank you all for presentations.

Thank you, NEI, for presentation of your upcoming standard format content. And everybody have a great day.

MR. MONTGOMERY: Thank you. Very worthwhile.

(Whereupon, the above-entitled matter went off the record at 2:02 p.m.)

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