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TECHNICAL SESSION - W14

REACTOR DECOMMISSIONING: PLANNING FOR TOMORROW

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WEDNESDAY,

MARCH 9, 2022

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The Technical Session met via Video-Teleconference, at 1:00 p.m. EST, Ashley Roberts, Deputy Director, Division of Decommissioning, Uranium Recovery, and Waste Programs, NMSS/NRC, presiding.

PRESENT:

ASHLEY ROBERTS, Deputy Director, Division of Decommissioning, Uranium Recovery, and Waste Programs, NMSS/NRC

BRUCE WATSON, Chief, Reactor Decommissioning Branch, Division of Decommissioning, Uranium Recovery, and Waste Programs, NMSS/NRC

DAN DOYLE, Senior Project Manager, Reactor Rulemaking and Project Management Branch, Division of Rulemaking, Environmental, and Financial Support, NMSS/NRC

CYNTHIA BARR, Senior Risk Analyst, Risk and Technical Analysis Branch, Division of Decommissioning, Uranium Recovery, and Waste Programs, NMSS/NRC

BRUCE MONTGOMERY, Director, Decommissioning and Used Fuel, Nuclear Energy Institute

P R O C E E D I N G S

(1:00 p.m.)

MS. ROBERTS: Good afternoon, everyone. Welcome back from lunch and welcome to the reactor decommissioning technical session "Planning for Tomorrow."

My name is Ashley Roberts and I'm the Deputy Division Director, in the Division of Decommissioning, Uranium Recovery and Waste Programs, in the Office of Nuclear Materials, Safety and Safeguards. I've been with the NRC for over 13 years, holding several mission and policy support positions across the Agency. Next slide, please.

As we all know, the nuclear energy landscape looks very different from what it was a few years ago. Decommissioning remains a growing part of our workload, because of the increasing number of power reactors, transferring to active or accelerated decommissioning immediately upon closure.

To adapt to this, the NRC continues to enhance and risk-inform the licensing and oversight of our decommissioning programs, by using lessons learned from the past as we plan for the future.

This afternoon's reactor decommissioning

panel is an extension of the panel we had during last year's RIC. Today, we'll hear about key milestones from the program over this past year, and how we are continuing to build on these activities, as we safely and effectively terminate licenses for power reactors and during decommissioning.

Let me welcome our four panelists representing the NRC and the Nuclear Energy Institute. The NRC panelists include Bruce Watson -- Bruce is the Chief of the Reactor Decommissioning branch -- Dan Doyle, a Senior Project Manager, and Cynthia Barr, the Senior Risk Analyst.

Representing the Nuclear Energy Institute on today's panel is Bruce Montgomery, Director of Decommissioning and Used Fuel at NEI. On the next slide, we will see their contact information.

With that, I would like to invite you all to submit any questions. Via the chat function on the platform throughout the session. We will address questions in the Q&A portion after the panelists present, and as time permits.

Thank you for your attention. And Bruce Watson, over to you.

MR. WATSON: Thank you, Ashley. My title of my presentation is Looking Forward in the Reactor Decommissioning Program. The program continues to grow, and the NRC is working hard to meet the challenge. The next slide, please.

The NRC's license termination rule will be 25 years old this year. The rule is performance-based and risk-informed, providing significant flexibility for the licensees.

Since 1997, 51 complex material sites, 18 research reactors and 11 power reactors, have completed license termination. Or in the case of power reactors, the site is reduced to the onsite dry field storage facility.

In 2022, a few more milestones worth mentioning is that 10 CFR 20 is 40 years old, and the NRC-EPA MOU on decommissioning is also 20 years old. Next slide, please.

Before looking forward, I thought it would be prudent to look back at the past. In addition to the important work that Cynthia and Dan will be talking about, our division had a number of significant accomplishments.

We terminated the 11th power reactor

license at Humboldt Bay, and in other words, we completed the final partial site release, leaving only the onsite dry field storage under NRC license.

The staff terminated two research reactor licenses at General Atomics. These are the 17th and 18th research reactor licenses to be terminated. On the material side, the staff terminated the license at Sigma-Aldrich.

Turning back to the reactor area, we were able to return to in-person public meetings, and held the Indian Point and Duane Arnold PSDAR meetings. We are in the process of scheduling the Diablo Canyon PSDAR meeting, which has been delayed by the pandemic. Next slide, please.

One area that I think we can all improve in is communication with stakeholders. Licensees should proactively communicate with the states and local officials on your plans for decommissioning.

This needs to be done in advance to ensure technical and regulatory issues are understood, with no surprises.

NRC continues to encourage licensees to sponsor and actively participate in decommissioning community advisory boards or engagement panels. This

provides an organized forum for exchanging information and input from the local community.

The NRC will continue to participate, when invited, to discuss regulatory processes at community advisory boards. Staff frequently meets with state and local officials, Native American tribes, and congressional staff. Next slide, please.

By 2034, only twelve years from now, based on licensees schedules and the 60-year completion requirement for the older plants, 20 plants, including the GE training reactor, will have licenses terminated.

The inventory will be down to only a handful of plants, as long as no more plants cease operations. And I'm sure the lower-level waste disposal site operators will be seeing a fairly steady stream of waste in revenues for the foreseeable future. Next slide, please.

At the last few RICs, I have stated that we could have as many as nine LTPs in the review process. Well, considering that we're presently reviewing the Fort Calhoun LTP, the remainder of 2022, 2023 and 2024 are going to be very interesting if the licensees do submit the LTPs on the schedules

they have told us.

The Fort Calhoun LTP included, I count ten. I sure hope the LTPs are of high quality.

Speaking of high-quality, NEI's been working on an LTP guidance to improve the quality of the LTPs, but I'm not so sure it will be very helpful in the near-term with the expected number of LTPs to be expected. Next slide, please.

We need your help and cooperation on licensing requests. The staff understands the cost associated with these licensing actions. So, the licensees must step up and manage their licensing requests.

The Committee continued to have licensing actions submitted without pre-submittal meetings. We have to continue to have requests for expedited schedules, even though the licensee has been advised that the expected times that we need to complete the licensing action.

Again, the licensees must do a better job planning and managing their licensing requests so the staff can accommodate the work.

Dan Doyle will be discussing the decommissioning transition rulemaking status. And

while this will make future plant permanent shutdowns more efficient, we have been receiving a number of first-time, first-of-a-kind, requests. Next slide, please.

Looking forward, the NRC is addressing our resource needs. We have a reactor decommissioning strategic budget plan, which includes more resources, including project managers, health physicists, and risk analysts.

In concert with our HR, Human Resources, support organization, we will continue to support the nuclear regulator apprenticeship program to help develop college graduates. We also have a comprehensive health physics training program that will help develop our health physicists.

Regional offices have consolidated the reactor operating health physics and decommissioning health physics inspectors, to make them more efficient with the use of resources.

And lastly, the decommissioning staff here at headquarters have cost-qualified a number of personnel to be decommissioning unit inspectors. Next slide, please. With the number of license termination plans expected, the licensees need a plan

to allow for adequate staff time to complete the licensing requests.

We have the NEPA reporting requirements to Congress that make it incumbent on licensees to provide quality LTPs. And some of the questions I have are, will there be more license transfers to accelerate decommissioning? I'm still concerned about sharing lessons learned and best-practices by the industries. And I think we are all concerned about the adequacy of the resources to support the decommissioning activities.

And then, lastly, in the long term, how will the potential approval of spent fuel consolidation and interim storage applications impact the decommissioning of the future reactor sites?

With that, I'll turn it back to Ashley. Thank you.

MS. ROBERTS: Thanks, Bruce. I will now turn it over to Dan Doyle, Senior Project Manager, who will discuss the status of the decommissioning. Dan?

MR. DOYLE: Good afternoon. My name is Dan Doyle, I'm a Senior Rulemaking Project Manager at the NRC, and I'm happy to be here today to provide an

update on the status of the decommissioning rulemaking.

The timing of the RIC and this project lined up perfectly, because we just published the proposed rule last week. So, we are officially in the comment period right now. Next slide, please.

As an introduction, let me start with the official title and a high-level overview of why the NRC is doing this rulemaking.

The official title is shown here on the slide, Regulatory Improvements for Production and Utilization Facilities Transitioning to Decommissioning. Sorry for the long title, but it doesn't have a clever acronym.

Some people refer to it simply as the decommissioning rulemaking, or the transition to decommissioning rulemaking. But this is the official title that you'd see on documents related to this project.

Why is the NRC doing this rulemaking? We're updating the regulatory framework for nuclear facilities transitioning from operations to decommissioning, with the following goals.

Maintain a safe, effective and efficient

decommissioning process, reduce the need for license-amendment requests and exemptions from existing regulations, address lessons learned from licensees that have completed, or are currently, in the decommissioning process, align requirements with the reduction in risk that occurs over time, while continuing to maintain safety and security, and address other relevant decommissioning issues. Next slide, please.

Current status and next steps. So, as I said, hot off the press we just published a proposed rule in the Federal Register last Thursday. So, that was March 3, 2022, if you happen to miss it. The comment period will be 75 days. So, the last day to submit a comment is May 17th.

We are planning for public meetings later this month and the meeting details for those should be coming out soon on the NRC website.

After the comment period closes, the NRC staff will review all comments and prepare a final rule package, and also update the regulatory guidance documents.

We will hold another public meeting later in the process to focus on implementation dates, and

we plan to provide the final rule to the Commission for a vote in the fall of 2023. Next slide, please.

So, taking a step back for a minute, I would like to provide some context about why the NRC started this rulemaking.

One of the direct reasons is because of the increase in plant shutdowns, some with relatively short notice. And this focused the NRC's attention on the need to consider some changes to regulations related to decommissioning.

There was a period of about 15 years, from 1998 to 2013, where no power reactors permanently ceased operations. But since 2013, as shown here on the slide, 12 power reactors permanently shut down, defueled, and entered decommissioning.

Coming up in the next few years, licensees for a pre-reactor have informed the NRC of plans to shut down, and several other reactors may be at risk of shutting down.

Factors affecting licensees' decisions. Although the licensee, and not the NRC, would make the decision to shut down a plant voluntarily, contributing factors affecting that decision likely

include current market conditions, such as decreased demand, lower-cost alternatives, or subsidies for renewable power, as well as anticipated plant modification, maintenance and repair costs.

The NRC has used case-by-case evaluations to adjust requirements designed for operating reactors, once those reactors decommission.

Since the reactor shutdown the number of potential accident scenarios and risks of radiological releases are greatly reduced.

The licensee's focus also changes from operations to decommissioning. And based on this, licensees have requested certain license amendments, regulatory exemptions, and relief from orders, that reflect this reduction in risk and change in focus.

Typical amendments include changes to the emergency plan, technical specifications, and use of certified fuel handlers, in lieu of licensed operators.

Typical exemption requests include emergency preparedness, security, and the use of the decommissioning trust fund for spent fuel management expenses. Licensees have also requested relief from the NRC's post-Fukushima orders.

Other NRC actions related to decommissioning include reviewing and holding public meetings on licensees' post-shutdown decommissioning activities reports.

The NRC staff understands that the decommissioning transition process can be improved and made more efficient and predictable by reducing the reliance on license amendments and regulatory exemptions. So, that is one of the drivers for this rulemaking.

I would like to note that the NRC staff published a comprehensive report in October 2016, capturing lessons learned and best-practices from the decommissioning licensing activities completed for plants that have shut down from 2013 through 2016. And the staff is considering these findings in their rulemaking.

The NRC had initiated a similar effort in the late-1990s, but it was set aside, as the Agency rapidly shifted focus and resources to the security of nuclear facilities and radioactive sources, following the terrorist attacks of September 11, 2001. Next slide, please.

This slide shows the major steps in the

rulemaking process that we have completed, and those that are still ahead. The yellow star in the center left box shows where we are today, with the recent publication of the proposed rule.

Public input has had an important role in the development of this proposed rule, and this comment period is the third comment opportunity for this project.

The first was when we published the advance notice of proposed rulemaking in 2015, and the second was the draft regulatory basis in 2017. We're seeking public comment on the proposed rule through May 17th to fully inform our rulemaking, and the public comment process is the public's opportunity to influence the regulation that will guide future nuclear power plant decommissioning. Next slide, please.

The NRC also published last week four draft regulatory guidance documents for public comment in parallel with the proposed rule. So, just to be clear, this is a combined request for comment, covering both the proposed rule and all four of the associated guidance documents together.

The first one, draft Guide 1346, is

emergency planning for decommissioning nuclear power reactors, and that would be a new regulatory guide.

The other three are updates to existing regulatory guides. Draft Guide 1347 is decommissioning nuclear power reactors, draft Guide 1348 is ensuring the availability of funds for decommissioning, production of utilization facilities, and draft Guide 1349 is standard format and content for post-shutdown decommissioning activities reports.

I would also like to mention here that the NRC staff recommended new or updated guidance for inspection procedures, in lieu of rulemaking, for several topics that were evaluated back in the regulatory basis stage. These topics were the post-shutdown decommissioning activities report submittals, the role of state and local governments in the decommissioning process, and aging management of certain plant system structures and components.

The staff's rationale for this approach is discussed in the regulatory basis document issued late in 2017.

The proposed rule includes a section called, Specific Requests for Comments, and there is

one, the first one actually, that focuses on post-shutdown decommissioning activity report submittals, and the role of state and local governments. So, we are seeking input on that. Next slide, please.

The proposed rule takes a graded approach to decommissioning, where different levels of requirements apply at different stages of the decommissioning process.

Across the top of this table are the four levels used in the proposed rule as a facility goes through the decommissioning process.

Level 1 begins after the facility dockets the two required certifications. One is for permanent cessation of operations, and the other is that fuel has been removed from the reactor vessel.

Level 2 is after a period of sufficient decay of the spent fuel, which would generically be ten months for a boiling water reactor, or 16 months for a pressurized water reactor, if they meet the criteria in the proposed rule.

Level 3 would be when all fuel is in dry cask storage, and Level 4 would be when all fuel is offsite.

The rows in this table show the topic

areas that have updated requirements linked to these levels. Emergency preparedness would use all four levels, starting with a post-shutdown emergency plan in Level 1 through Level 4, where there is no longer a need for an onsite radiological emergency response plan, because all fuel is offsite.

Other topic areas that use a graded approach include physical security, cybersecurity, and onsite/offsite insurance. Next slide, please.

So, to wrap this up, here are the major steps for the path forward. Again, we just started the public comment period for the proposed rule. The last day for comments is May 17th.

We are planning for public meetings later this month and we'll post additional information on the NRC website when that's available. We will then review and address public comments and develop the final rule and final regulatory guidance. The target date to submit the final rule to the Commission for review and vote is fall of 2023.

One final point that I'd like to make is that we developed a dedicated webpage on the NRC public website with convenient links to the proposed rule and related documents, as well as information

about previous and upcoming public meetings.

I encourage you to check that out if you will be reviewing the proposed rule. Probably the easiest way to find the link is if you find the press release from last Thursday that is featured prominently on the NRC home page right now, NRC.gov, it's currently the fourth item listed under latest news.

We look forward to your feedback on this proposal. Thank you very much, and I will turn it back over to Ashley.

MS. ROBERTS: Dan, thanks for that update. I will now turn it over to Cynthia Barr, a Senior Risk Analyst, who will give us an update on guidance updates, as well as other decommissioning initiatives. Cynthia, over to you.

MS. BARR: Can everybody hear me okay? All righty, hello. My name again is Cynthia Barr. I'm a Senior Risk Analyst at the NRC. I'm here to provide an update on guidance and other decommissioning initiatives. You can go ahead and advance it to the second slide.

Okay, so guidance updates include two of three volumes of our consolidated decommissioning

guidance. NUREG-1757, Volume 1 is more of a process, or programmatic-type document for material sites undergoing decommissioning.

Volume 2 is a more technical guidance document, focused on radiological surveys and dose modeling to derive cleanup levels. The volumes were last updated in 2006, so there were lots of updates needed.

The Multi-Agency Radiation Survey and Site Investigation Manual, or MARSSIM, has also been revised. The public comment period ended just last month and the MARSSIM working group is working hard to address comments. Next slide, please.

Okay, proposed significant changes to NUREG-1757, Volume 1, include guidance related to changes in fees, as sites transition from operations to decommissioning. New guidance on the decommissioning planning rule found at 10 CFR 20.1406, related to the minimization of contamination during operations.

And this is just to help facilitate decommissioning down the road and prevent creation of future legacy sites. It's not to be confused with Dan's rule that he just talked about. This is an

older rule.

A status update on the Site Decommissioning and Management Plan, or SDMP, the SDMP was the predecessor of the license termination rule, and ended in 2004 after all the program objectives were met. Next slide, please.

Okay, so major changes to NUREG-1757, Volume 2, are listed on this slide. I'll provide a couple of examples.

Key updates to dose modeling guidance are primarily found in Appendix I and J, on topics such as exposure scenarios for buried radioactivity, methods to introduce more realism into the dose modeling calculations for multiple elevated areas, and support for risk-significant distribution coefficients, including potential need for site-specific values.

Updates to guidance on radiological surveys are primarily found in Appendix G, and include surveys of open excavations, substructures and materials planned for reuse, and Appendix O guidance on use of composite sampling, which could alleviate costs associated with sampling for hard-to-detect radionuclides. Next slide, please.

Okay, so NUREG-1757, Volume 1, is being completed and is planned to be issued for public comment later this year.

NUREG-1757, Volume 2, was issued for public comment back in December of 2020. We received over 200 comments and nine comment letters. The comments have been addressed and final revisions incorporated into the report. Final publication is expected in late-summer of this year, 2022. Next slide, please.

Okay, so MARSSIM is a multi-federal Agency guidance document that was recently updated in Revision 2. The update was about 20 years in the making, so lots of updates were needed.

I will not go through all of the changes, but some important updates include new guidance on scan-only surveys, additional examples and guidance on statistical tests and associated parameters, updated information on radiation-detection instruments used in the field, and a new Appendix E on rank set sampling, which could also be useful for hard-to-detect radionuclides.

The public comment period just ended in February, and the document has been peer-reviewed by

EPA's Science Advisory Board. Next slide, please.

I wanted to provide an overview of EPA's Science Advisory Board and public comments. They include comments on scan-survey validation, and the metrics that are used to demonstrate compliance using that method.

Comments on the need for additional guidance on more modern survey systems with data logging, survey methods for discrete radioactive particles, or hot particles, and survey methods for sub-surface radioactivity, which is harder to access compared to surface radioactivity, and comments on the measurement quality objectives, including transparency, terminology, types of and methods for addressing uncertainty. Next slide, please.

Next, I'll be talking about other decommissioning guidance and code development initiatives, including development of subsurface investigations guidance, and discrete radioactive particles communications and/or guidance, and finally, visual sample plan computer code improvements.

I did want to make it clear that any interim guidance the NRC develops will be issued for

public comment prior to its issuance. Next slide, please.

With regard to subsurface investigations guidance, we did have a workshop last year with over 160 participants attending. So, there's great interest in this particular topic.

Our contractor, SC&A, is completing a draft technical report this month, focused on methodologies for survey design. A second workshop is planned for May 11th.

Pacific Northwest National Laboratories also completed a scoping report, the Visual Sample Plan code improvements, to facilitate subsurface survey design and data analysis.

NRC staff plans to develop interim guidance based on SC&A's final report and the workshop findings in late-2022.

Please also check out our digital exhibit on the subsurface project at the RIC website for additional details. Next slide, please.

So, we are also looking at survey and dose modeling methods for discrete radioactive particles, or DRPs. DRPs have been found at some decommissioning sites.

Licensees should be aware of potential activities that could generate DRPs, and have a program in place to control DRPs to avoid issues with assessing the presence and risk significance of DRPs at the time of license termination.

Public meetings are planned for late-2022 to discuss this issue. Staff is evaluating the need for interim guidance and/or some other form of communication on this topic. Next slide, please.

Visual Sample Plan was a code developed by PNNL to help design and evaluate radiological surveys. This slide lists a number of improvements to the code. The first two improvements are already incorporated in the current version of the code, and the code is available for free download at NRC's RAMP webpage.

PNNL is currently scoping out subsurface survey design and data analysis tools, which will be available in a future revision to the code. Next slide, please.

So, in conclusion, several guidance initiatives are completed or well underway to share lessons learned and experience from recent decommissioning reviews. NRC has contracted work to

improve the guidance in two key areas, as well as scoping out improvements to computational tools.

NRC will continue to work with our stakeholders, with additional opportunities for public participation planned.

Please check out our What's New in Decommissioning webpage to be kept informed of meetings and progress on our guidance development, including all the things that I discussed today. Also, many staff are involved in these projects, and they are listed in slides at the back of this presentation.

Should you have any questions or comments, please do not hesitate to reach out to NRC staff. And with that, I'll turn it back over to Ashley Roberts to introduce our next speaker. Thank you.

MS. ROBERTS: Thanks, Cynthia, for the details on all those program initiatives. And thanks to all the staff and the program working on those.

With that, I will turn it over to Bruce Montgomery, from the Nuclear Energy Institute. Bruce?

MR. MONTGOMERY: Thank you, Ashley. I

always appreciate the opportunity to speak at the RIC. I lead the NEI Decommissioning Working Group at NEI, which is the leading convening authority for the decommissioning industry. And my title is Director of Decommissioning and Used Fuel, NEI.

You might recall that last year at the RIC I outlined a 2025 vision for what I call a new normal in decommissioning, and the steps that we would need to take to achieve the decommissioning objectives as part of a truly sustainable industry.

I think we're often judged, in any industry, by the footprint we occupy when we build and operate, but also by the footprint that we leave behind when we're done. And in nuclear, we strive to make that footprint as close to zero as possible.

So, this year I want to reinforce the premise that our success in decommissioning is key to demonstrate to the policymakers, the invested community, and to the public, that commercial nuclear energy is indeed a truly sustainable enterprise.

Success is not a given in the path that we have chosen. The path that we've chosen and the path we have chosen to take in the United States is accelerated decommissioning using some pretty

innovative business models.

We'll need to show that we can use these business models to take a nuclear plant from shutdown to greenfield, and do so safety, on schedule, and within the budgetary limits of the decommissioning trust fund.

Now while there's a lot of enthusiasm that we can achieve typical schedules of eight years or less with these models, there are challenges that must be overcome if we are to achieve our goals. And I think we've heard some of the discussed already this afternoon. Next slide, please.

I chose this quote from a contemporary Japanese philosopher, because I think it really applies to our situation. "No matter how complex global problems may seem, it is we ourselves who have given rise to them. They cannot be beyond our power to resolve."

So, consider the fact that many of the plants that are in decommissioning today started from a Greenfield site that was turned into an operating reactor in only four or five years.

So, it seems to me it should be reasonable that we'd be able to do the reverse in

eight years, or even considerably less if we put our minds to it, and if the regulatory framework facilitated it. Next slide, please.

Over the past year, we've seen some pretty impressive achievements in some important areas for expediting -- in a safe and orderly transition for the decommissioning process. And I expect we'll see some more. I've listed some here and I won't go through those, but I think at the heart of these successes is what I would call sound project management being brought to bear on the business by decommissioning specialty companies.

And one of the outcomes that is emerging is a growing public acceptance for the process, where the emphasis now is less focused on the decommissioning process per se, but more on how soon a site can be returned to the community for productive use. Next slide, please.

I'd like to highlight a couple of notable achievements that have occurred just this past year.

At San Onofre, the Energy Solutions Team demonstrated that an entire reactor vessel could be packaged, safely shipped, and disposed of as a unit, avoiding the need for segmentation onsite.

And at Oyster Creek, the Holtec team emptied the spent fuel pool and placed all fuel in dry storage in record time, only to be surpassed by the team at Pilgrim, demonstrating that the time for shutdown to cessation of operations can all be placed in dry storage in as little as 30 months. This reduces the critical path of projects. Next slide, please. So, while we celebrate these successes, we must take note of the challenges that remain. And I'll put them in three bins.

On the front end, we need a durable regulatory framework for transitioning out of operations for decommissioning. The current framework, involving many license amendments and exemptions, is impractical and adds little value to the public in terms of safety and security.

We're very heartened by the presentation that Daniel gave us on the new rule. That will not be in effect for the current wave of plants going through decommissioning. So, we're really talking about the future for decommissioning and having a stable regulatory framework.

Now, in the middle, we need to achieve a higher degree of collaboration, as Bruce spoke to so

eloquently a little while ago, and thus, every year, collaboration of the industry, in terms of sharing what works, what doesn't work, so that we can accelerate performance improvement.

And on the back end, and this is what Cynthia addressed, this is becoming increasingly and painfully apparent, as we need a stable and practical license termination process that is informed by the real public health impacts associated with the release of a site for unrestricted use. Next slide, please.

So, what is being done to meet these challenges? On the front end, again, we're very pleased with NRC's release of the proposed transition rule last week and we're excited to offer comments on this broad-ranging rule and the associated guidance.

It's an awful lot to work through, but we have a very large and diverse industry team that's been assembled, looking at all the different aspects of the rule.

We'll respond to the rule, the guidance, or procurements that are destructive, but we'll also respond to the special questions that have been included in the rulemaking package. So, we're really

eager to do that.

In the middle, we're seeking to encourage a higher degree of industry calibration. And we're pleased to acknowledge the work done by EPRI to make their extensive decommissioning library widely available to decommissioning company licensees and their contractors, companies that aren't necessarily a member of EPRI at this point in time.

There are now many industry forms that share experience, industry competences, working groups and issue-specific task forces, that work diligently to bring new information to the market and share that information to improve performance.

And finally, we have an NEI set of board-level executives that form a high-level decommissioning task force, we need to address issues effecting the decommissioning industry, including the degree to which we exhibit the principles of continuous learning and improvement.

And finally, on the back end, the industry is working hard with the NRC to develop a license termination process that will reliably result in unrestricted release of former reactor sites in a way that meets public health standards. And I'll

talk more about this in a moment. Next slide, please.

The good news is, as Bruce Watson discussed earlier and talks about in each RIC, is that we know that we can demonstrate to the NRC that decommissioning objectives have been achieved, and that radiological public safety goals have been met for unrestricted release of the site.

Here, we have the Humboldt Bay site, which is the latest example of that. The NRC terminated the license for this site in November. It was a long time coming, but we've gotten to the appropriate end point. Next slide, please.

And here we have the Zion site, where physical and decommissioning work has been completed for some time now, but is working through a rather arduous process of final status surveys, in anticipation of license termination.

And here, we find the licensee working through issues, some of which Cynthia has addressed, which is the need to make sure that we dealt with the presence of discrete radioactive particles, and also subsurface structures. Next slide, please.

And at the LaCrosse site, where

decommissioning work has also long been completed, and the effort to achieve NRC agreement to terminate the license has been delayed.

That's a coal-fired plant you see in the background, a fully decommissioned nuclear plant occupying the space in the foreground.

There are several reasons for these delays at Zion, La Crosse and elsewhere, reasons that can be reasonably attributed to both the NRC and to licensee performance.

My observation was that the root cause is for lack of a universally accepted guidance on how license termination is supposed to be planned for and executed by the licensees, and then reviewed and approved by the NRC. Next slide, please.

Hence, the industry's main effort in decommissioning today while we review the proposed transition rule, is to develop industry guidance on how to achieve license termination.

NEI 22-01, which is currently under development in draft form, seeks to distill thousands of pages of regulatory source material into a comprehensive but concise guide on how to plan for and execute a successful license termination process.

We plan to share a draft of our document with the NRC in June, with the goal of submitting the report for NRC review and concurrence by the end of the year.

And we look forward to the workshops that Cynthia talked about, which are going to be addressing in a couple of the key technical and process issues related to how to do subsurface surveys and provide the requisite data with results to the NRC in a quality fashion, and also to address the way to deal with the presence -- and to prove the non-presence, I should say -- of these discrete radioactive particles.

There's a lot of work to do yet, but our intent is to achieve the goal that Bruce Watson laid our earlier, which is to provide guidance to the industry, so that the license termination plans that are submitted for review to the NRC are quality plans that are accepted by the NRC and can be executed by licensees in a high-quality fashion. Next slide, please.

So, in conclusion, I would say that the future of accelerated decom, while promising, is still a work-in-progress. Whether or not we are

successful here will determine the viability of these business models that have emerged to support decom. Thank you. Back to you, Ashley.

MS. ROBERTS: All right, thank you very much, Bruce. Okay, with that I invite everyone to continue to submit questions in the chat function. And I think we've already received a couple so far. And the first one I have is for Bruce Watson.

Bruce, the first question is, at what point in decommissioning does NRC oversight end?

MR. WATSON: Well, it's a reasonably easily easy question to answer, because at material sites when this licensee demonstrates they meet the unrestricted license dose requirements, we can terminate the license and we leave.

For reactors though, it's a little bit more complicated. For reactors, we shrink the site down to the dry fuel storage facility, or independent spent fuel storage facility.

But that remains under license. So, most of the NRC policies go away, with the exception of those required to make sure the fuel stays safe and secure in the dry storage facility. So, once the dry fuel is decommissioned, then we will go completely

away.

MS. ROBERTS: And just to supplement that, we continue oversight through the decommissioning process.

MR. WATSON: That's correct, including inspecting the dry fuel storage facility.

MS. ROBERTS: Yes. Thanks, Bruce. Okay, the next question I have is for Dan Doyle. Dan, can you elaborate on the lessons learned that you gathered, and how they are influencing the decommissioning rule that you discussed? Rulemaking that you discussed?

MR. DOYLE: Sure. I can start with this one. And Bruce may be able to add some additional information.

That was a bit before my time. I've been involved with this project since 2018. I know that the lessons learned report that I did mention was in 2016.

I pulled it up when I saw the question and I scanned the recommendations, which are on page 40 there. Actually, none of those jumped out to me as something that we included in the rule. But maybe Bruce might be able to recall any.

But what I can point out is if you look in the proposed rule that we just published, we have the document as organized in the discussion section by the 16 topic areas.

So, for example, emergency preparedness, physical security, so you see that under the major provision section, and then in the discussion section above the heading for each of those, with some background information about how do things work today, what does the NRC see as regulatory challenges or issues in this area, and what are we recommending changing? How do we think it's going to address that?

So, if you wanted to look in there, if any particular topic you wanted to see kind of more information about where it came from, you can look at that.

And just to point out that -- let's see. I think perhaps the low-level waste change from 20 to 45 days I think might have come out of those lessons learned. I'm sorry, I'm just not extremely familiar with the origin of where the input came from.

And then just a final point is that, so the following topics were something that the NRC

staff had reviewed and is recommending changes. It wasn't specifically directed by the Commission to include here.

So, the topics for drug and alcohol testing, cybersecurity, the foreign ownership control domination, and the clarifications between Part 50 and 52 licensees and the rule language, were topics that the staff had included as determined to be relevant to decommissioning. So, I hope that answers the question. Bruce, anything else you want to add to that?

MR. WATSON: Sure. I was the chair of that lessons learned group, along with a counterpart from NRR.

I think the overriding lesson learned in the big picture was that we really needed to revise our regulations to make the transition from operations to decommissioning more efficient.

There's a number of different examples. You gave one, which is that 10 C.F.R. 20, Appendix G, which increases the notification time from 20 days to 45 days for the shipment of radioactive waste.

And quite simply, the reason for that is a lot of the licensees ship bulk waste by rail. And

it's not a direct line like you would have with a truck. So, it takes more time. And they do track the shipments during the transportation.

Secondly, I was going to say most of the changes clarify a lot of our information. And we found that we didn't properly address a few different things, and especially in the spent fuel area, where we have duplication. And so, this clarifies all of that.

So, there are a lot of lessons learned that the whole rulemaking is based on. I hope that's helpful.

MS. ROBERTS: Thanks, Bruce. Okay, the next question I have is for Cynthia. Cynthia, what was the impetus for the subsurface guidance that you talked about?

MS. BARR: Thank you, Ashley, that's a very good question. So, almost all complex decommissioning sites have subsurface residual radioactivity, however, MARSSIM is just for surface soils. So, there was an initiative to develop, I think it was called MARSAS, which is the subsurface equivalent to MARSSIM, a while back.

And that would have been in conjunction

with the other federal agencies working on the MARSSIM and other documents.

But the other guidance documents took precedence over MARSAS, and so the initiative fell by the wayside. And there's also this perception that it was going to be very difficult to do for all the different types of sites the federal agencies look at.

So, the other problem is that subsurface soils are harder to access. So, survey design optimization can become a very complex problem.

Now, we did have lessons learned though, from surveys of subsurface soils at materials and reactor sites that we had recently reviewed, so we did update our guidance in Appendix G and J on surveys of open excavations and soils planned for reuse.

Appendix J has some exposure scenarios for buried radioactivity, including reactor basement substructures. That guidance is really focused on surveys and dose modeling for, again, an open surface where you can apply MARSSIM to. So, it was a little bit easier to provide guidance in that area.

We're still looking at those particular

issues and making sure those methods make sense, or see if there's another method that we could use to handle open excavations as well.

But the larger problem that we have is, when you don't have an exposed surface, how do you go about trying to optimize a survey design for what could be very large volumes of soil? You can't scan the soils unless you dig them up.

And so, it became a very difficult problem. And it's a problem I think at a lot of sites. Not only NRC licensees, but other sites. And internationally, I think people are looking for a MARSSIM-type document for the subsurface.

Now, we can't address all of that, but we did think that we could focus on the types of sites that we decommission, including reactor sites, and come up with something that would be doable.

And there are international and domestic examples of how to do this. So, we contracted out with SC&A, and PNNL is also looking at further improvements to Visual Sample Plan.

But this is about methodologies that could be used to address this particular problem and optimize the survey process, as well as tools to

determine if remediation is necessary, or determine remedial volumes, and even to demonstrate compliance.

And this would draw on a lot of prior information, Bayesian approaches, as well as geostatistical approaches, and just use all the expertise that experts have to offer to optimize these sampling designs and make better decisions based on this approach.

And so, we hope to issue some draft guidance, this technical report, very soon. This month we're going to be issuing a draft technical report from SC&A, our contractor, PNNL's coming in with a scoping report for Visual Sample Plan for code improvements, to implement those methodologies as well, and talk about those at our May 11th workshop.

And so, I would just remind you we have decommissioning website where you can stay abreast of all the activities related to those initiatives. And hopefully, that answers your question.

MS. ROBERTS: All right, thank you, Cynthia. The next question comes to us from Spain, for Bruce Watson. Bruce, plans for the rigorous security program during operation, that includes carrying out routine security drills, can you

describe how requirements typically change during the years the plant is undergoing decommissioning?

MR. WATSON: Sure. At a high level, nothing really changes when he plant shuts down. The security plans and drills and training all continue. The focus is on protecting on the spent fuel. And so, during the first year or so, nothing really changes.

With the fuel being transferred to the dry storage, with the completion of that and with all the fuel in the dry fuel storage, it has its own security plan and requirements for drills, training and maintaining a proficient security workforce.

But the remainder of the site maintains what I'll call an industrial security force. They continue to be armed and to protect the property, and they also have training and drills commensurate with the work that they do to protect the site. I think that's about it.

MS. ROBERTS: Thank you, Bruce. Okay, the next question, I think we'll start -- Bruce Montgomery, you're going to start, and then Bruce Watson, you might have something to add here as well.

In order to share lessons learned,

licensees need to share information. Most decommissioning companies confer their processes trade secrets, which are proprietary, and refuse to share with competitors as a result.

Can you elaborate on what is being done by NEI or the NRC to share this information and capture lessons learned?

MR. MONTGOMERY: Sure. Thanks, Ashley. I think I'll start by maybe framing the problem a little bit, because I came from the operating side of the fleet into this decommissioning business.

And one of the things I noticed right away was the stark difference in the degree to which information was being shared between the companies that were the asset purchase model, or the license stewardship model, where you had decommissioning specialty companies running the operation.

Whereas in the operating fleet, we were used to seeing the free and open exchange of information, from problems to successes, and how to solve the issues that are arising, to the point where decommissioning, there's just -- there was very little of that.

And not only because of trade secrets or

proprietary information, but just there was no framework around which to work with each other. And there's no operating experience database for decommissioning companies, or a venue with which to exchange.

But we are working to change this and improve this situation somewhat. I mentioned the EPRI decommissioning hub, the rather significant -- you can call it a vast library of decommissioning experience that resides at EPRI and was, up to this point, only available to EPRI members. It's now being made available to all folks involved in decommissioning. And we're advertising that availability, the first can use it.

And it's going to set up a two-way exchange of information where people can not only draw from the database, but also deposit information at EPRI that others can use.

But aside from that, we do want to steer clear of exchanging proprietary information that folks have built their companies around. That's not what we talked here. And there's an awful lot of information above the level of proprietary information and trade secrets that we can share to

improve our performance across the industry.

There are things like -- gee whiz, there's even things we can learn in decommissioning from the operating fleet, like how to maintain water clarity in the reactor while we're doing a major activity such as the segmentation of reactor internals.

But there's an awful lot -- I mean, an awful lot -- that we can learn from each other, in terms of, for instance, being successful in this whole new area of license termination processes.

How to do surveys, so that we can get them done very efficiently and quickly, and provide the quality information the NRC needs to make a conclusion on the state of the site.

How to write reports that submit information to the NRC, so that they're not flooded with thousands and thousands of pages of dose readings and data that they would have to pour through and try to come to some conclusion on.

We need to be much more efficient on how we collect and package and submit information to the NRC. And this is all free and open territory for us to improve our performance and share information

across the fleet.

MS. ROBERTS: Bruce, thanks for that. I appreciate your comments and your focus on how you all can communicate across, and how you're driving that improvement in quality will help us be more effective in our reviews.

I know that that's certainly a focus for our division, and for Bruce's branch specifically. So, Bruce, did you have anything you want to add there? I know you mentioned some of that in your remarks as well.

MR. WATSON: I was just going to add that the licensees can request that information be considered proprietary information, and that it not be disclosed to the public.

We really respect that information request, especially when it comes to financial information. But the bottom line here is we, as the NRC, want to make sure those regulations are followed very closely. So, we do agree that information can be withheld if it is proprietary.

So, we do our best to make sure that we do keep information that is proprietary, proprietary. I want to applaud the previous efforts by EPRI and

NEI in the industry to share previous lessons learned.

I think we've seen some of the dismantling processes evolve, at like Connecticut Yankee, they used a grit blasting for dismantling the reactor internal. Some of the technologies have improved significantly, and I think that's business information that competitors can find competitively good to get and find out what the best processes are.

I guess the big things are when -- and then in operating space, operating reactors, if someone does things that are not exactly done well, they generally advertise that so others don't make the same mistakes.

So, I'm not necessarily -- I think there was more freedom when there were utilities to advertise for the whole industry to improve. I'm not so sure we'll see that with the competitiveness of the companies doing the decommissionings. Thanks.

MS. ROBERTS: Okay, the next question we have is for Dan. Dan, you indicated that you are seeking, and the NRC is seeking, input on state and local government involvement on decommissioning as part of the ruling. Besides those comments

submitted on one or more of the draft reg guides, are there any other options that state or local governments or others would have to provide more direct feedback as part of our preference?

MR. DOYLE: Thank you. So, as part of the rulemaking process, the best way to provide input is by submitting written comments. So, we do have the instructions for how to do that in the proposed rule. So, my short answer is to provide comments on the proposed rule if there's a specific change that you would request or recommend for something that's within the rule.

In response to the question, we have that in Section 5, specific requests for comments, so you could submit a comment that's in response to that question.

You could also provide comments on the guidance, as I said, and also participation at the public meetings. So, commenting on the rule, commenting on the guidance, participating in the meetings.

MS. ROBERTS: Thanks, Dan. I think the next question, Dan, is for you and Bruce. Maybe we'll start with Bruce Watson and you might want to

add something as it relates to the decommissioning rulemaking as well.

Bruce Watson, have you found that community, state and stakeholder interaction increases during decommissioning?

That's part one of the question. And part two, how will the rulemaking address ongoing stakeholder interaction during active decommissioning and after the PSDAR meetings?

Bruce, I'll let you start and if you want to turn it over to Dan?

MR. WATSON: I think during operations there's always a public interaction with the utility that operates the plant. Those are normally done through the public affairs officers for the company.

But I do think they do shift to a slightly higher level, not higher level, with decommissioning. I think the community wants to hear more information on what's going to happen at the plant.

When the plant was constructed, it was all clean material. When it's being decommissioned, you're removing all the radioactivity and so people are concerned about that having an impact on the community.

So, I think there is an increased interest in the decommissioning. You couple that with the loss of economic income, taxes, revenues to the local government, and that brings out a lot more concerns by the local community.

We continue to want or request that the utilities or the decommissioning companies continue to have community advisory boards to get information to the community, provide information exchange, and allow them to be more informed on the decommissioning activities that are planned.

I don't know if I --

MS. ROBERTS: The second part of the question, I think we'll let Dan start, is how will the rulemaking address ongoing stakeholder interaction during active decommissioning and after the PSDAR meeting?

Dan, did you want to start with that one?

MR. DOYLE: Sure, there's no specific change as part of the rule regarding interaction outside of the standard process if there was a license amendment request that would -- I'm not an expert in the license amendment process, but I believe there's an opportunity for stakeholder involvement in those

just generically.

But we're not making a change to that as part of the rulemaking.

MS. ROBERTS: So, yes, there's opportunity for public engagement so thanks for that. I will go to our next question here, Bruce Watson, you touched on this a little bit in your previous response about impact as plants are decommissioning.

And so this question is related to that. Does the NRC have initiatives underway to help communities and address socioeconomic issues where operating power reactors are shut down and converted back to rebuilds?

MR. WATSON: That's a very difficult situation. The NRC is an independent safety regulator, we're not a promoter of nuclear power or anything associated with it.

So, we don't get involved in the economics or in the business decisions with the plant operating or not continuing to operate.

So, with the loss of tax revenues, as I've mentioned, jobs and other things are a big impact to the community and we would encourage the local communities to negotiate with the licensees on any

commitments they may have to support the local community to ensure those continue, at least in the short term.

So, unfortunately we don't have any regulatory authority that was given to us by the Congress to do anything with the economic issues.

MS. ROBERTS: Thanks, Bruce, I'll just add a little bit on that.

We do have an environmental justice initiative going on in response to the Commission direction where NRC Staff is conducting a systematic review of how environmental justice is addressed in NRC's programs and policies.

And so we're committed to openness with the local community and that openness is absolutely a core value for the NRC. That's something we're committed to.

So, Bruce, just to add to the statements that you made about continuing our communications and openness with local communities, it's certainly a focus for us as well.

Thanks for that, Bruce, I'm just looking at the next question here. Bruce, this one is for you. The normal pace of decommissioning has surveys

being done well before the licensed termination plan is approved by the NRC.

Since the approved LTP formed the basis for the final status surveys, how can a licensee and the NRC ensure that such surveys performed prior to the LTP approval roll out for NRC acceptance?

MR. WATSON: That's actually a really easy answer. Our inspection program continues, our inspectors will be looking at and observing surveys that are performed prior to the LTP being approved.

We make it clear to the licensees that since we don't have established release limits, or DCGLs as we would call them, that they are at risk.

But we can also supplement the inspectors with our independent contractor and have independent verification surveys performed to make sure that we think they are going to meet the criteria that will be in the LTP.

We've done this on numerous occasions, we mentioned Humboldt Bay earlier in this program.

We did a number of surveys for them well before the LTP was approved and a lot of these were conducted with the demolition of their two fossil units that were also adjacent to the nuclear plant.

And so there's lots of ways we can ensure that the sites are cleaned up well before the LTP is submitted for approval.

MS. ROBERTS: Thanks. Even with that, Bruce, when the LTP comes in for approval, we would still be reviewing actions and plans associated with LTP to ensure they are carried out in accordance with the LTP once approved.

So, just because something is done before, once the LTP is approved, we're still going to be following anything that's approved in the process, just to underscore your comments there.

MR. WATSON: Absolutely, we're going to continue to inspect, we're going to perform independent confirmatory surveys with our independent contractor and do our due diligence to make sure that the site is cleaned up and meets all the requirements.

MS. ROBERTS: Thanks, Bruce. The next question I think, Dan Doyle, is for you. We've gotten a few questions on the status update of decommissioning the GEIS.

Do you want to touch on that for us, please?

MR. DOYLE: The generic environmental

impact statement for decommissioning that the NRC will update, that is not part of the decommissioning rulemaking project that I'm talking about so it's not in parallel with that but it will be updated separately.

I don't have a timeline or additional information that I can provide right now about that but I am aware that's something the staff is going to update.

It was in the staff requirements memorandum but it's being handled separately so the NRC would put out more information about that in the near future.

MS. ROBERTS: Thanks, Dan. All right. The next question I have is for Cynthia, if you want to get us started, and Bruce Montgomery, you can add NEI's perspectives on this as well.

How do you expect the guidance update, Cynthia, that you discussed will improve the effectiveness of the decommissioning process?

MS. BARR: Thanks, that's a very good question. So, I'm just going to tackle that from some of the guidance updates that we do have in several areas.

And I think these are all really good improvements to our guidance that are really going to help increase the transparency of our guidance and provide a good roadmap to our licensees on how to accomplish decommissioning.

So, one area is the DRP guidance, discrete radioactive particles ro hot particles. We've seen comments on both MARSSIM and NUREG-1757 Volume 2 on the need for guidance on DRPs, so it's definitely an area I think that our licensees can benefit from additional information.

I think some form of DRP guidance is needed but whether that's just the consolidation of the existing record, which may or may not be complete, or new guidance drawing on the historical record with additional details not fully developed is what we're currently evaluating.

Are there any gaps in the current record? And we're reaching out to contractors to assess survey methods and dose modeling methods and we're looking at different codes to perform the dose calculations.

And there's a lot of domestic and international references as well, so we're taking a

really hard look at this. But I think what we end up with is going to be really valuable in the end to industry and to our stakeholders.

So, I'm looking forward to continuing to work with our stakeholders on developing that guidance or communications. Composite sampling is another area that we added to our NUREG-1757, that's in Appendix O. So, composite sampling can be useful for radionuclides when a cost associated with taking a large number of samples can become cost prohibitive.

So, being able to combine samples and reduce analytical costs so you can get a better estimate of the mean, I think, is going to be very helpful in a lot of situations, and the licensees are probably going to want to take advantage of that.

And so having better estimates of the mean, better data, and these approaches that are beneficial to the industry will just lead to more stable decisions, I think.

And if we're worried about elevated areas, we also have the modified investigation level where you could go back assess if there's a potential for elevated areas as well.

So, we're not really compromising the survey approach but we're ensuring protection of public health and safety in a way that may be perhaps a little bit more efficient.

We've already talked about subsurface survey design optimization. We're also investing in computational tools. It doesn't really help to have a methodology that nobody can implement or they don't know how to do it.

So, we're really investing in both the methodologies and the computational tools to increase effectiveness of decision-making by taking a more formal approach to this problem.

It may not be MARSSIM exactly, but it's drawn upon a lot of parallels that MARSSIM uses in making sure that you make better decisions and limit decision errors.

And so I think using all the information that's readily available, historical site assessment, expert judgment, contaminant transport modeling, geostatistical tools that look at spatial correlations of the data that you have, we're really taking this data-driven, decision-making approach and optimizing the sampling design, which will make the

whole process more efficient and decisions better hopefully.

My final example is Scenario B. We did emphasize in both MARSSIM and NUREG-1757 the Scenario B method, which has an alternative null hypothesis that the site is clean until proven dirty, and that can be very useful when the DCGL is low or close to 0 or it's low relative to background variability.

And so this provides a method so that you're not cleaning up below background. And so we don't want a situation where we're asking the licensee to clean up below background.

So, hopefully we'll have more examples and more applications of that particular null hypothesis when it is appropriate and that will be helpful as well. Those are some of my top four thoughts at the moment.

Thanks for the question.

MS. ROBERTS: Thanks, Cynthia. Bruce Montgomery, is there anything you wanted add from NEI's perspective?

MR. MONTGOMERY: I just wanted to react to that by saying that all the work that Cynthia is heading up at the NRC with the contractors is

absolutely critical to getting to the point where we understand what would be acceptable to the NRC in putting together all the license termination plan with the final survey status plan within it, and then execute it in a way that NRC can accept the results in an efficient review process.

The only caution I would have is that I see an awful a lot science coming at the NRC from the contractors and these tools that are being developed, but what we really need in the end is going to be a process to how is it going to be expected that we can apply those tools in a statistical science that goes behind it and so forth so that we can come up with actual methodology in the field to conduct surveys and submit reports to the NRC that satisfies the need. So, I think that's key.

I think also there was recognition of the fact, in one of the questions that was asked, that these surveys are starting well before a license termination plan is submitted to the NRC.

Some of these surveys are done during operation and are credited during license termination planning and execution.

So, there's going to be a need, and this

underscores I think the importance of this guideline that we're putting together, that will make the process more efficient and more timely and less costly for both us and the NRC.

And we'll directly address some of these resource challenges that we have because we really just need to have a better understanding of what the expectation is given a situation at a particular site and how we're going to go about proving that we're up to the appropriate standard of 420.

So, a lot of work is being done, I appreciate what Cynthia is heading up and I think it's going to be beneficial going forward. I think we just need to keep our eye on the real target, which is going to be practicable methodologies that we can put in the field.

MS. ROBERTS: Thanks for that, Bruce.

The next question we have is for me so I'll read the question for myself here. Given the limited resources for LTP reviews outlined by both NRC and mentioned by NEI during their presentation, what is being done to address this resource issue and how might future LTP reviews be affected if resources remain limited?

That's a good question and for those of you who were able to listen to our EDO, Dan Dorman, speak earlier today, you heard Dan talk about the focus that we have on recruiting and retaining a highly skilled workforce and making sure we have the right people to do the work that we need.

And of course, as you heard Bruce and Bruce talk about, the organizational capacity to be able to support these reviews is certainly a focus for us right now.

So, a couple things for those of you who didn't hear Dan's remarks, I encourage you to listen to those, he talked a little bit about this as well. But we do have an effort right now in partnership with our Office of the Chief Human Capital Officer focused on enhancing our external hiring, filling out gaps across the program.

Those gaps are identified through our strategic workforce planning and so we are really bolstering those efforts right now.

While we're working on that, you heard Bruce mention we're cross-qualifying and leveraging inspectors across the program so we're prioritizing and focusing on work throughout the program based on

our priorities.

And some of the things you've heard about today is also how we're managing the work we have in front of us now. We expect that we would enhance our effectiveness with some of the results of what comes out of the decommissioning rulemaking that Dan talked about.

This question just came after you heard Cynthia and Bruce Montgomery talking a little bit about some of the effectiveness of process-enhanced improvements from the guidance documents that we're working on.

And again, as mentioned when Bruce Montgomery was talking some of what NEI is working on in terms of focusing on their quality of their reviews, which will in turn improve the review process here in the NRC.

In addition to that, and we talked a little bit about this for those of you who didn't get the opportunity to listen at our Commission meeting not that long ago for the decommissioning on low-level waste business line., During that Commission meeting there was an overview, that is available also on our public website, of our systematic approach to

workload planning.

And there we are really looking at our lessons learned, from what it is taking us to complete these reviews, especially under the new business models and the time that's taking us and what's required so we can have more fidelity in our resource estimates.

Which is then again the starting point for everything you just heard me discuss and how we're focused on recruiting and getting the right people here at the right time and retaining those individuals, which is a huge focus for our culture and focus for us as well.

So, that's a wide overview of the things we're doing and I think you heard some other panelists in other sessions talk about that as I mentioned as well. With that, I will go to the next question.

Bruce Watson, this one is for you. Could you please elaborate on the restricted release options for decommissioning? Are any licensees pursuing this option and is there any related guidance development underway?

MR. WATSON: There's a really simple answer to this --

MS. ROBERTS: Bruce, you have an echo. If you mute the second one I think that will take care of that.

MR. WATSON: I'm sorry, I didn't hear you.

MS. ROBERTS: You have an echo. There you go, I think you fixed it. Yes, you're better, go ahead.

MR. WATSON: Thank you. There's a very simple answer for this question. The regulations in 10 CFR 20 have very explicit requirements for restricted release and in NUREG-1757 Volume 2, there's a large section on restricted release.

The good news is no one's really requested it. We had one site, a materials site, that was investigating it a number of decades ago and they decided not to pursue their restricted release.

So, all of our sites that have been terminated to date have been terminated for unrestricted use. So, they're available for whatever purpose the licensee wants to use it for into the future.

I hope that answers the questions.

MS. ROBERTS: Thanks, Bruce. I have one

other one, Bruce, and this is somewhat related to -- you had made some comments about the surveys prior to LTP approval and Bruce Montgomery made some additional comments on this, as well.

But as a follow-up question related to inspections and surveys prior to LTP approval, could this approach apply to licensees of operating reactors in support of future partial site release?

In other words, involving other non-nuclear facilities or structures similar to what was described for Humboldt Bay?

MR. WATSON: Absolutely. In 10 CFR 50.83, there are regulations for partial site releases and so the licensees could look at those particular requirements. We have done these at other operating facilities. We're talking with one licensee right now at an operating facility who wants to use some of the land for a solar farm adjacent to the reactor.

And so it's part of the licensed property so we've asked them if they want to pursue a partial site release to release that area from the NRC license. So, it's a very viable option for not only the reactors but for material sites.

MS. ROBERTS: Thanks, Bruce, we're down to the last couple minutes here so I think I'll take this additional question and Bruce Watson, if you want to start? I know, Cynthia, you may have some things to add as well.

Bruce, the question is can you provide some examples of risk-informed elements in the decommissioning program in general and the license termination process specifically?

MR. WATSON: I think I can address a few of those. In risk-informing the decommissioning process, including the licensee termination process, it's really to look at what's the really important things to make sure they are completed and to the right level of completion.

We've looked at the program, especially recently, the inspection program and have the inspectors focusing on the most important parts.

So, in the license termination area, obviously the performance of the surveys and getting quality results, no matter how you get there, but making sure the techniques and the measurements and the approach are appropriate, and that the results are repeatable is the key to license termination and

the one area where we risk-inform our review.

MS. ROBERTS: Thanks for that, Bruce, I'm glad you mentioned updating our inspection guidance. As you said, we did make some updates to codify and standardize that risk-informed approach to our oversight and strengthen the effectiveness of our program.

That allows the inspectors the flexibility to select the reviews that have the most safety-significant consequences. But as we've riskinformed those procedures in the decommissioning reactor program, the number of overall inspection hours didn't change as a result but we're sure to riskinform the areas. So, I think that's a great example and I'm glad you highlighted that.

With that, we are down to the end of our time here. I want to thank all of the panelists, Bruce and Dan and Cynthia and Bruce, for joining us this afternoon.

It was a great panel. I joked there wouldn't be a panel if there weren't two Bruces, so I had to get the last names in there. But thank you both very much and thank all of you for your presentations this afternoon.

And also I would be remiss to not thank Kim Conway and Annie Ramirez who are helping field questions for us.

Thank you very much and everyone have a great afternoon.

(Whereupon, the above-entitled matter went off the record.)