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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS

DIVISION OF SPENT FUEL MANAGEMENT

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DSFM REGULATORY CONFERENCE 2019

(REG CON)

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WEDNESDAY

SEPTEMBER 18, 2019

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The conference met in the Crowne Plaza Philadelphia-King of Prussia, 260 Mall Boulevard, King of Prussia, Pennsylvania, 19406, Freedom II Conference Room, at 9:00 a.m., Daniel Mussatti, facilitator, presiding.

PRESENT

DANIEL MUSSATTI, Facilitator

MICHAEL LAYTON,

Director, Division of Spent Fuel Management

CHRIS REGAN,

Deputy Director, DSFM

RAY LORSON,

Regional Deputy Administrator, Region I

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Session IV:

VERONICA WILSON, DSFM

BRUCE MONTGOMERY, Nuclear Energy Institute

JEREMY SMITH, DSFM

JEREMY TAPP, DSFM

JOHN McKIRGAN, DSFM

MARK RICHTER, Nuclear Energy Institute

ALSO PRESENT

HAILE LINDSAY, NRC Staff

TOMEKA TERRY, NRC Staff

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

9:03 a.m.

MR. MUSSATTI: Welcome back. I hope everyone had a great day yesterday. Before I turn the meeting over to Chris, what I'd like to do is take a moment to just go over again what our house rules are.

That's make sure your phones are off or on mute so that we don't have any distractions. One person at a time talking. Be respectful of others. Stay on topic as much as possible. Keep your questions and answers short so we can get as many people in as possible.

Our job here is to make sure that the information is accurately recorded so that we can make sure we have a good, clean transcript of this, so what we're doing is we're using a court reporter.

He needs you to state your name very carefully into the microphone and your affiliation before you start speaking. Speak slowly and directly into the microphone instead of off to the side where it makes it harder for him to hear what's going on.

And then for the people on the phones, we have an operator today, and I don't think we have anybody on the phones except for me. Is that correct?

THE OPERATOR: We do have a few

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participants on the line.

MR. MUSSATTI: Oh, good, they're starting to fill up. We had to announce through Skype what the new phone number was for them, so the people are taking a moment to get online, but if you could take a moment and explain to the people that are on the telephones how it is that they alert you that they need to be in the queue, I would appreciate that.

THE OPERATOR: Sure, for the duration of the call, all lines will be placed on listen only until the question and answer session. At that time, if you would like to ask a question, you would press star one and record your first and last name. If you need to withdraw your question, you would press star two.

MR. MUSSATTI: Okay, and we're going to have a handful of presentations, and then we're going to have a question and answer period, and occasionally I will be going back to our operator and I'll be asking her if there's anyone on the phone, so please be patient and please be polite when you're on the phone calling in or in the audience, either one.

And with that, I'd like to turn this over to Chris so we can get the day going.

MR. REGAN: Good morning.

I'm glad to see some of you came back, and

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we have some new folks participating today. I very much appreciate you showing up. We had some very good sessions yesterday.

We covered three of the principal areas that the NRC focuses on, oversight and licensing being two of the key ones. And we also had a session yesterday on, I guess it would be called external engagements, and these three core areas really speak to what our mission is.

And when we think about spent fuel storage and transportation, there were two basically key themes that I believe I heard yesterday.

I have been around the NRC for quite a while, and about two decades ago, I started with some time in spent fuel as a technical reviewer, so for me, this was a little bit of going down memory lane.

We had a focus on storage. It was all about spent fuel storage. We were starting to license new designs for storage casks. Transporting fuel was so far out on the horizon, we really didn't think about it. It was primarily just about storage.

So here we fast forward about 15 years from when I first started in spent fuel storage and we're beginning to look at things like aging, license renewals, transportation of spent fuel somewhere. It

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was a little bit of a paradigm shift for me mentally from what I recall spent fuel used to be like to what it is today.

So the discussions yesterday were very interesting with respect to what can we do with a framework that was established 20, 30 years ago to make it a more efficient and effective process?

We heard some good presentations. Let's see, we talked about NDE, and repair techniques, and Jeremy, great presentation from EPRI. We talked about renewals and aging management from John Wise.

Katherine gave a superb presentation on what we are trying to do to transform our inspection process. If you think about the early days of inspection, all the ISFSIs were co-located at an operating reactor or a reactor that was in decommissioning.

They had the resources and the depth of expertise from the operating reactor staff, to where we are today where there are quite a few ISFSIs that are orphan sites. They're away from reactors. They're at sites that are decommissioning that don't necessarily have that nexus with an operating reactor.

So looking at our inspection program from the ground up, basically trying to be transformative,

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to look at the most areas that are most risk significant or safety significant really was taking a step back and looking at how we really fundamentally do business.

So I thought that was a really good presentation and kind of reflective of where we are looking at the whole storage environment that we have.

The second area, which is what really intrigued me when I was invited to come back to spent fuel, is there's so many things that are different. Transportation now seems to be one of the key aspects that's generating a lot of interest and discussion.

Consolidated interim storage. That wasn't even on my radar when I was here 15 years ago.

We had PFS and there was, you know, MRS is actually in the regulations, but the actual reality of something like that happening was very, very far-fetched. It's very real now.

We are in a technical review process that we can see the light at the end of the tunnel with respect to licensing these things, so that's a very big change and we heard some good information. Jose gave a presentation yesterday on the status of those two reviews.

You heard Bruce Watson talk about the state

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of decommissioning activities in the U.S. When it comes to spent fuel storage, they almost kind of go hand in hand. You can't talk about decommissioning without talking about waste.

And let's see, what else? And then of course I mentioned the transportation aspect. Jeremy gave a presentation yesterday on how we are going to provide regulatory, what the regulatory framework for transportation is going to look like, oversight for transportation, the relationships between DOE, DOT, NRC, and any of the other stakeholders in this activity.

So it was a whole bunch of really, really interesting topics, both from a historical perspective, at least through my eyes, to what we are looking forward to in the near and somewhat distant future.

So today we have some really good stuff.

We are going to talk about future enhancements, which is what I was alluding to earlier.

We will have another session this afternoon after lunch that will talk about technical issues, some of the key technical areas. Included in there are one of the things that's near and dear to my heart and to Mike's heart, which is the graded approach.

We really want to encourage you to ask lots of questions. We had some good questions yesterday.

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One of the key premises of having our workshop or our REG CON here is to engage a public or engage a new audience that we typically may not have been able to reach had we held the meeting in Washington.

So this morning and this afternoon, please feel free to speak up. The microphones are live. We want to hear your feedback. Ask lots of questions, and without further ado, I'm just going to jump right into introducing the first topic.

So Veronica Wilson and Bruce Montgomery are going to talk about future enhancements, and thank you for your time. I think we're going to transition here for a few minutes, so, all right.

(Pause.)

MS. WILSON: Good morning. My name is Veronica Wilson. I am a shielding and criticality reviewer in the Criticality, Shielding, and Risk Assessment Branch in the Division of Spent Fuel Management at the NRC, and I have the distinguished pleasure of introducing our speakers for the next session along with Bruce Montgomery from NEI.

This is our session on future enhancements.

We've got some really good talks and we've got some really good speakers.

I think every single one of these

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presentations was touched on in some way in the presentations that you heard yesterday, so I think there's going to be a lot of good interest and a lot of good information that's given.

We do have one change. Marilyn Diaz-Maldonado will not be presenting on the advanced fuels, so in her place, you will get to hear from John McKirgan.

I also have the pleasure of introducing the third Jeremy to complete the Jeremy trifecta, and I do want to thank Brian Gutherman for opening the floor for the Jeremy jokes, as I told both Jeremys that I'm happy to indulge in all things Jeremy for this morning's presentation.

So without further ado, I would like to introduce Jeremy Smith who will be giving a talk on the graded approach which has a lot of interest, and he is currently a senior nuclear engineer in the best branch in the NRC, which is the Criticality, Shielding, and Risk Assessment Branch in the Division of Spent Fuel Management.

Prior to joining this branch in 2002, he worked in NMSS, Fuel Cycle Safety and Safeguards Division in both the Fuel Cycle Licensing Branch and the Special Projects Branch as a project manager and

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criticality safety reviewer.

Before joining the NRC in 1998, Mr. Smith worked for several years in the nuclear industry as a senior nuclear engineer for Lockheed Martin at the Portsmouth Gaseous Diffusion Plant as a systems engineer for Commonwealth Edison at the LaSalle County Nuclear Station and as an engineer at the D.C. Cook Nuclear Power Plant.

Mr. Smith received his BS in nuclear engineering from the University of Michigan and an MS in environmental management from the University of Findlay. Please join me in welcoming Jeremy Smith.

(Applause.)

MR. SMITH: Well, good morning, everybody.

I am the third Jeremy. I think this is how nicknames start, unfortunately. So I want to thank you all for the opportunity to present to you this morning, and I'll be discussing the graded approach.

So the purpose of my presentation today is to provide the NRC's perspective of the graded approach project and the agency's next steps to apply the lessons learned in the consideration of future activities to risk inform spent fuel storage.

We characterize the graded approach to mean a process to apply risk insights and staff expert

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knowledge, which is decades of experience with the licensing of spent fuel storage designs, in order to streamline Certificates of Compliance and technical specifications, and to make for a more efficient licensing review process. In essence, an approach that is consistent with our effort to achieve a reasonable assurance of adequate protection.

The graded approach also has the effect of enabling increased flexibility for CoC holders and licensees to implement changes without the need for prior NRC approval, which stakeholders have indicated is one aspect of a reduced regulatory burden.

I will briefly revisit the background of the graded approach, including a discussion of the goals and a summary of the pilot review. I will also provide an overview of the actions we plan to take based on this graded approach initiative to better apply risk information in regulating spent fuel storage.

Both the NRC and industry recognize that there is a need to improve the efficiency of the licensing process for dry storage of spent nuclear fuel under 10 CFR Part 72.

Our experience has revealed that the level of detail in the CoC and tech specs has grown significantly over time. We've heard from

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stakeholders there is too much information in the CoC and that this extra information detracts from what is most important.

Currently, the licensing process continues to consume a large portion of both NRC and industry resources, and the NRC realized that it had the opportunity to do better. Innovation and better risk informing our processes is now the name of the game.

As you all likely know, back in October of 2016, an agreement was established to follow the guidance of NEI's Regulatory Issue Resolution Protocol to move forward in identifying, evaluating, and implementing changes.

This RIRP provided a process and framework for collaboration between NRC and industry on issues such as this, that is, the development of more risk appropriate dry storage licenses and CoCs, AKA, a graded approach.

As part of this process, TN Americas has agreed to submit a pilot CoC project for review by NRC using the proposed new review criteria. This application was submitted as Amendment 16 to CoC 1004 and is currently in the final stages of the review process.

So what are we all seeking to achieve

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through the implementation of the graded approach? We know that the risks involved in the dry storage of spent fuel are very low. The level of regulatory review can be made more consistent with the level of risk if more licensing changes are opened up to be reviewed by the 72.48 change process, which the other Jeremy will cover in more detail in his presentation.

The goals are as they appear on the slide.

We want to improve the licensing efficiency, encourage a more risk-informed approach, and reduce the number of future licensing changes in the amendment process.

So what have we learned so far from the pilot? During the pilot review, the Staff found significant changes to the CoCs and tech specs occurred in prior amendments to incorporate new designs or design changes in complex loading schemes to the storage systems.

As amendments added new models, the CoCs and tech specs grew. New models are routinely added to cover a broader variety of canisters and over packs, and additional loading schemes for fuel are added to support the increasing variety of spent fuel.

For instance, in the initial TN Americas CoC, they had 10 different models of canisters. The original CoC also did not include a fuel qualification

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table. This was added at a later amendment. Subsequent amendments relied on the fuel qualification table for defining spent fuel cooling time.

These types of changes complicate the Staff's ability to understand the bases behind the Staff's prior approvals when applying the evaluation criteria of the graded approach.

One of the main outcomes of the pilot was an agreement to remove, reword, or relocate review items. The Staff generally agreed with a large variety of items that can be removed from the CoCs altogether and other types of information that could be relocated from the CoCs and tech specs to the FSAR.

Nothing technical has been changed in the FSAR. Wording was cleaned up throughout to avoid redundancy and to make things more logical and clear, for example, the organization of information or the removal of duplicate information, on and on.

The Staff also completed revising the contents' definition requirement for the CoC and has resolved the issue of relocating the fuel qualification tables from the tech spec to the FSAR.

The approach that is being utilized is a bounding fuel qualification table that will be placed in the tech spec with the other fuel qualification

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tables contained within the FSAR. This is in line with providing a reasonable assurance of adequate protection.

So what are the next steps as a result of this graded approach pilot? The first step is to issue this pilot amendment. Staff is currently finalizing the integrated safety evaluation report with the goal of having it completed by the end of September, after which it will be headed over to rulemaking. That process takes an additional few months, which would have it out on the street most likely early next year.

By using the lessons learned from the pilot to better reflect what technical specifications are needed, a revision to NUREG 17.45 will be undertaken to bring it into alignment with the graded approach.

Once these actions are completed, the SRP for dry storage will be revised to reflect all of the changes as a result of the graded approach methodology.

Realizing that revising these guidance documents will likely take some time, the Staff is engaged with NEI in developing a guidance document, which Rod referred to in his presentation yesterday and I believe is going to be touched on in the last session today, and this guidance document would need to be reviewed and endorsed by the Staff based on the

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final graded approach.

This would allow for implementation of risk insights in to dry storage activities while the NRC works to update our own review guidance documents.

The Staff has also recharged our efforts to implement risk insights into our activities. These are ideas that we are pursuing as possibilities as a result of the graded approach effort.

We are piloting a process to apply risk insights in the conduct of 72.48 inspections. This process involves considering risk insights in the evaluation of 72.48 summary reports to determine the most risk significant inspection areas.

We are developing a way to look at 72.48 inspection criteria in a risk-informed way and have an addendum to the inspection module in draft now. The other Jeremy plans to cover this in more detail in his presentation, so I'm not going to go into it here.

We've also engaged with our Office of Nuclear Regulatory Research regarding development of a risk evaluation process or methodology for dry storage, and we envision the development of a risk metric as a possibility.

The NRC realizes that using risk insights

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can help to prioritize the use of resources to focus reviewer and inspector's resources on those items of higher risk significance.

Support from research will be used to develop processes and tools to risk inform dry cask storage, transportation package licensing, and oversight regulatory activities. These tools would consider previous probabilistic risk analyses, studies, and requirements to incorporate into the use of risk insights.

This work is envisioned to consist of three separate tasks, the first of which is to develop a process or tool to incorporate risk insights into our process for determining and prioritizing the review of license amendment changes related to storage applications.

Subsequent tasks would include expanding the process to include transportation package licensing reviews and finally, to cover other regulatory applications.

In summary, I want to note that it's the NRC's objective to seek, identify, and implement means to be a more efficient and effective regulator. Applying a graded approach is one example, but it should be just the starting point.

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Implementing and practicing risk-informed decision making, applying the principles of reasonable assurance of adequate protection, and leveraging our extensive knowledge and experience in what is essentially a mature spent fuel storage industry needs to be the guiding light of how we operate in the future as a regulator. Thank you.

(Applause.)

MS. WILSON: Some people say that all things come full circle, as do the Jeremys because we are returned to Jeremy number one, and I would like to say that this Jeremy needs no introduction because he gave a great presentation yesterday on transportation inspections.

But just to refresh your memory, he joined the NRC in 2004 as a reactor engineer in NRR performing technical reviews related to BWR reactor systems, which we were in that branch together at that time, so it's kind of fun that we're here now together talking about spent fuel.

So he transferred to Region III in 2006, then he spent the next eight years performing operating reactor, decommissioning reactor, and ISFSI inspections before coming back to headquarters in our division now in 2014.

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Currently, he performs inspections of dry cask storage and transportation packing vendors, and performs reviews of quality assurance programs.

He holds a bachelor's degree in nuclear engineering from the University of Illinois at Urbana-Champaign. Please welcome, again, Jeremy Tapp.

(Applause.)

MR. TAPP: Good morning.

Thanks, so I'm back, like it or not. So I want to start off today by giving credit to the individual, my colleague, Marlone Davis, who put this presentation together.

Unfortunately, he wasn't able to come to the meeting today. He's actually off on inspection this week. It got shifted, so things changed, but I want to give credit to him for this and I'm going to do my best to fill in for him today.

I believe the transition from the other Jeremy's presentation on the graded approach to this is a really nice transition, and there is anticipation of a lot of things, you know, moving from technical specifications to the FSAR.

So this could really, I think, potentially reduce the number of license amendments that will have to be taken, but perhaps increase the number of 72.48

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evaluations that would be performed from FSAR changes, so I think that's really where we're going to be going into here today and to discuss those 72.48 program enhancements based on this anticipation.

Okay, so just a quick introduction on the content of the presentation, we're going to go into describing the purpose and then success, I think, for this presentation, the background on the document being revised and other program enhancements. But the main part of the presentation is going to be the overview and status update of the program changes under 72.48, then a summary, and then we'll save the questions for last.

So Marlone always likes to start with this slide, so I'm not going to change things up on him, and he always likes to define success for presentations, so I'm going to do my best to do the same, and so what is the purpose and what is a success for this presentation, and that's to provide an overview of NRC's future program enhancements regarding the 72.48.

So first, background on the program document changes and updates, so here on the screen you can see a listing of some of the documents that will be changed or updated, or at least the current ones that we have, and then, you know, so we want to

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hear -- stick with the theme of our bringing the spent fuel program management to you. We want to just kind of put this all out there, and so we're going to go right into those documents and the associated changes.

So currently, we have implementation requirements for 72.48 which include the associated evaluations necessary, and these are guidance documents for that. Of course we have in place NEI 96-07, Appendix B, which is endorsed by the NRC with Reg Guide 3.72, Revision 0, so I'm not going to talk about anything about that. I just want to kind of give the current status of where we're at.

Looking forward, NEI 12-04, Revision 2 was submitted to the NRC in September 2018 and is planned to supersede NEI 96-07, Appendix B, so therefore, the NRC plans to perform an endorsement via a revision to Reg Guide 3.72, which then in turn would be Revision 1 to that document.

This draft regulatory guide is expected to be publicly available this fall for comments, which is part of the routine regulatory guide concurrence and issuance process.

You might have noticed this little space craft or flying saucer here in the bottom of the screen.

Marlone really likes to add little tidbits and things

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to his presentations to kind of mix things up, so he put this in here as kind of a pointer that these are the things that are looking forward into the future, so you might see them scattered about throughout the presentation.

So I think what most folks here might be interested in is really what has changed between 96-07 and the new 12-04, and what is planned to be endorsed by Reg Guide 3.72, Revision 1? And really the major change is regarding the method of evaluation for the position.

The current guidance on method of evaluation or MOE needed improvements, clarifications, and simplifications to make the guidance document more useful to 10 CFR 72 licensees and certificate holders, and to the NRC staff as well.

This position change will allow the licensees or the certificate holders as the design authority to apply other MOEs used in establishing the design bases or in the FSAR as update to other CoC amendments.

The NRC's change in position regarding MOEs will allow for better alignment and consistency with other regulatory programs, i.e., 10 CFR 50.59, and increase regulatory efficiency by potentially reducing

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the number of CoC or license submittals that arrive to the NRC for review and approval.

The basis for the NRC Staff change in position is derived from several factors. One, the NRC reviewed and approved the MOE for the intended application and documented the results in the safety evaluation report.

Two, the licensee or certificate holder is responsible for evaluating if a change constitutes a departure from a MOE requiring prior NRC approval, and three, the NRC has the opportunity through oversight to inspect the licensee or certificate holder's evaluation.

So I just mentioned the opportunity that we had for the NRC to inspect these evaluations or changes, and as part of the NRC's suite of ISFSI inspection procedures, it includes inspection procedure 60857, which is titled, Review of 10 CFR 72.48 evaluations, and it's a document that we as inspectors use to select samples and review 10 CFR 72.48 screenings and evaluations based on their risk significance.

So the process to select an inspection sample is not just really as simple as this diagram on the slide shows, but it's really meant to show that, yes, even now, the current selection of 72.48 samples

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that we do are based on risk significance and will continue to be moving forward.

So the current process, just to give you a reminder, it uses a section of IP 60857 that describes the important safety classifications, and those come from our NUREG/CR-6407, and they define the important safety categories from the highest, A, to the lowest, C, and then even defines what not important to safety would be, or not important, yeah, exactly.

So if a component is important to safety, it will either, one, maintain the functions or conditions, and those include confinement, criticality, shielding, and heat removal necessary to store the spent fuel safely. Two, they will prevent significant damage to the spent fuel container during handling or storage; or three, provide reasonable assurance that spent fuel can be received, handled, packaged, stored, and retrieved without undue risk to the public health and safety.

So really what we're doing during the inspections, we're selecting structures, systems, and components that are important to safety for the dry fuel storage system and then focusing on changes to the category A components that are the most risk significant, and really this is what we're currently

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doing.

So where are we going? That's where we're going to go. We plan to add a new appendix to IMC 2690, the ISFSI inspection program document we've been talking about yesterday and today, and then reference that in inspection procedure 60857.

So this guidance will further inform and proceduralize the process for performing 72.48 reviews during inspections so as to focus on the most risk significant changes.

And the process starts by looking at the four functional areas you see on the slide here, and those are necessary for the safe storage of spent fuel, and that, you know, was addressed by the definition I just discussed in the last slide from the inspection procedure.

And we developed our risk scheme based on the important to safety classification concept as before, as we thought, you know, why change something that already has a good base? But now with a more focused and detailed approach, we broke it down into the four safety functions here: confinement, criticality, shielding, and heat removal.

Now, before I move on to get into detail the process, I want to mention that this draft process

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was used at a recent Orano TN Americas corporate inspection this year, and to ensure that it performed as we expected, and make any improvements gained through actual use of the draft process.

So continuing with the new process, each of the safety functional areas were broken down into levels based on the potential change in risk due to a change using 72.48, and the result was that tables were developed at the NRC that rated the storage system's structures, systems, and components from levels one to three based on their potential impact on safety with level one causing the largest potential increase in risk and three, the lowest or none.

These tables were developed by a panel of experts at the NRC based on expert engineering judgment, ITS classifications from NUREG/CR-6407, risk insights, and operating experience.

So I want to go through. You can see on the top, confinement, so I really just picked a confinement example to go through with the different levels here from the four different functional areas.

So an example for C1, so C confinement level one, a design change to the canister shell itself or the lifting lugs that could increase for its direct impact to the confinement barrier. The risk could

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increase.

Let's say for C2, base metal repairs performed on the canister shell for license compliance could have a low increase on risk depending on the satisfactory completion of those repairs.

And for C3, a repair to a locally undersized area of the canister inner diameter by a slight local reduction in basket rail thickness, it could potentially have a very small or even no increase in risk due to the minor and localized nature of the issue.

So the tables are applied to focus the 72.48 inspections on those changes that could have the greatest impact on risk to each functional area.

So really I want to pull it all together here. So in the past, we did it based on judgment of ISFSI's risk using the ITS classifications, and that has been documented in IP 60857.

Currently, we're continuing to develop the standard risk-informed approach to incorporate by reference the 72.48 inspection procedure, which would be this appendix to IMC 2690, and then ahead, using this new standard guidance to further risk inform our review and screenings during inspections.

So in summary, we're both moving forward with the NEI 12-04 endorsement using Reg Guide 3.2 and

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updating the risk guidance used in 60857 for performing 72.48 reviews to make them more consistent, and in turn, hopefully more efficient reviews focusing on those changes that have the potential increase in risk.

And really this is because we only have so much resource to do the inspections, and considering the potential increase in the amount of rates that we could see, we want to make sure that we're focused and that we have enough time to look at what we really need to look at during inspections. So with that, I'm finished. Thank you.

(Applause.)

MS. WILSON: Thank you, Jeremy. Our third speaker in this morning's panel we would like to thank for taking on this presentation at the last minute is John McKirgan, who you all know from yesterday morning's panel session. He's currently the Chief of the Spent Fuel Licensing Branch in the Division of Spent Fuel Management here at the NRC.

He's held a number of responsible positions at the NRC, including previously being the Chief of the Reactor Systems Branch in the New Reactors Office and Chief of the AP1000 Licensing Branch in the New Reactors Office.

He has a bachelor's and master's degree

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in mechanical engineering from the University of Maryland College Park. Please welcome John McKirgan.

(Applause.)

MR. MCKIRGAN: Good morning. Thank you, everybody. Thanks. It's a pleasure to be here. I do -- I'll express the regrets Marilyn couldn't make it today, and so I want to thank her for a wonderful presentation.

And then one of the great things about, you know, subbing in at the last minute is you just defer all of the hard questions to Marilyn and promise that she'll get back to you, and maybe I'll use a lifeline to some of my colleagues, but --

So the talk today is about advanced fuel technologies that are coming. You know, this is an area that is, at least for me, pretty exciting. I think there is a lot of potential. Certainly there's a lot of interest and discussion behind these fuel technologies.

They introduce some interesting technical challenges. They introduce some potential for the industry in terms of efficiency, but the thing I'm most excited about is the potential for enhanced safety.

And so the agency is looking at this very seriously. We're taking a hard look and we're doing

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a lot of stuff to try to be proactive and ensure that we enable a very smooth transition to the use of this technology.

So the talk today, I just want to go through a couple of things, a background for some of you who may not be aware of what's going on with the accident tolerant fuels, and talk about some accomplishments.

Even though this is an emerging field, we do have some early successes that I want to talk about, give you a brief snapshot of our status and our plans.

I'll point you to, unfortunately, back to ADAMS on -- we've documented a lot of our plans.

I'll give you some ML numbers to make those searches easy, and talk about something near and dear to my heart as the licensing branch chief, the licensing critical path, and so I'll talk about that. I'll give you some conclusions, all good stuff.

So if I could, just for those that may not be familiar with this area, accident-tolerant fuels is an emerging area for the industry. It's gotten a lot of discussion in Congress, a lot of discussion in the industry, and basically these are new fuel technologies.

When you look over the history of nuclear

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power, the fuel has been relatively stable. There have been some minor tweaks to the fuel technology, but now industry is really starting to look at some variations to enable enhanced safety, which is our key message, and also some operational flexibility for them, and so there is a fair bit going on in this area.

One of the big thrusts for industry is to get to the point where they are batch loading full cores of these fuels by 2023, and so that's an important milestone for us and the agency.

We have engineered our program and our licensing processes to try to meet that milestone, and so that's kind of a focus for us and you'll see that throughout the planning that we've done.

So one of the things that we've developed here is a plan, right? So you've got a milestone. We need a plan. There's a ML number there for our ATF project plan, and this is actually an agency-wide plan.

We're working with our partners in the Office of Nuclear Reactor Regulation. It's an integrated plan throughout the ATF cycle from soup to nuts. It's a comprehensive plan.

There is also a fair bit going on in our new merged division. As Mike mentioned yesterday, the

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Division of Fuel Cycle is going to be merging with the Division of Spent Fuel, and one of the conveniences, one of the efficiencies there is that all of these NMSS issues associated with ATF all come under Andrea Kock, and so Andrea is going to have the joy of moving this kind of exciting area through the regulatory framework.

So let me talk about this for just a minute and talk about that kind of more comprehensive fuel cycle. Again, many of you are familiar with this, but I just want to make sure we're all talking from a common framework.

Obviously you'll have some enrichment under Part 70. There's a Part 70 license. You'll have to transport that material under Part 71. Then you've got to move to some fuel fabrication facility back under Part 70, more transportation under Part 71.

It goes into the reactor. That's one of the main features here is to burn it under Part 50, and then you've got to transport the spent fuel back under Part 71 and store it somewhere under Part 72. So you've got that life cycle.

Andrea's got most of that with the exception of that one little piece in Part 50. She's got 99 percent of the life cycle and the reactor guys get one percent, but --

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The technologies that are being discussed are pretty varied. A lot of those technologies involve proprietary information, and so the commonality of the sharing of this information has been a little challenged, and we can talk more about that in a bit, but basically you're looking at some different cladding technologies trying to get enhanced performance, and also some different enrichments of the pellets.

The traditional enrichments have been up to five percent, and so we're looking at -- some of the industry is exploring higher enrichments, and that is getting back to adding operational flexibility so that it can have longer run times between refueling outages.

And so then you've got, in a parametric space, you've got combinations and permutations of all of these things, and so it can get a little dicey to try to get your head around all of the possibilities and potentials that industry could be coming to the agency with in terms of licensing actions, and so Marilyn has listed a few of them here.

You've got different fuel in the pellets, different cladding types. We're also a little mindful of a lot of the advanced reactor stuff, and some of the advanced reactors are looking at some extremely

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novel fuels, much higher enrichments, and so we're trying to keep an eye on those things and making sure our program is tailored to be able to capture these things.

Let me talk about some early wins. Obviously you can't just jump into loading into the core on day one, a lot of work by industry, a fair bit of work by the agency in order to enable those transitions in technology. We are a conservative industry, and that's a good thing. That's right for safety.

So there have been a number of lead test assemblies. There's kind of a chicken and the egg problem here where you're looking for data to demonstrate the safety of your new system, but how do you get that data?

You need to burn some lead test assemblies in the core and then get those materials out so you can do destructive testing to get the data to then demonstrate a more comprehensive safety story for the full batch loading of those, so that's been a process.

We have, on the agency's part, been very agile. I'm really proud of the team that we have. We've been able to turn around some packages very quickly to enable industry to meet some of their very

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short turnaround for their refueling outages.

There is a fair bit happening quickly here, and so I'm very proud our RAJ II package was turned around, the traveler package, the MAP-12, MAP-13 package. These were things that hadn't really been on our radar early.

We didn't, in some cases, have a lot of lead time to know what was coming and what the details of the licensing strategy was going to be, but we were able to turn to -- because this is an important area for the agency, it is a focus for us, and we were able to turn those around very quickly.

On the fuel cycle side, of course, there are also modifications that have to be made, and so the agency has quickly done a license amendment for URENCO to allow some changes to their SARs, their licensing documents.

Moving on, so I've touched on this a little bit. Let me go through this a little bit more systematically. ATF, the industry is looking at higher assay low enriched material between the five and 20 percent range of enrichment.

This introduces some really exciting technical challenges in terms of criticality benchmarking and really revisiting your safety case for why

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you think you're safe in terms of criticality, and this is an area that may need additional data, may need additional bench marking.

The agency's perspective is demonstrate safety, and how the industry chooses to do that, there are some options. Certainly getting additional data is a good one, and that is a very reliable approach.

It is at times a little costly, and in the long run, I think this data will start to come out. You can also look at uncertainty modeling, but there, it kind of complicates the licensing review.

So this is an area that I think we're going to need a lot more engagement with the industry on as their plans continue to mature. That's an area where I'm going to phone a friend if there are questions later on that.

So the NRC has developed kind of an appendix, a special plan for this high burnup, higher enrichment aspect of the overall ATF strategy, and there's a ML document there. We had a very good public meeting not too long ago, September 12.

Additionally, we've had some good interactions with NEI. There have been some good dialogue. NEI has been assisting the industry, as they often do, to kind of coordinate some of these

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activities.

It's a competitive market out there. There is a lot of proprietary information, and so NEI has been assisting and kind of pulling together some of the common themes, some of the common issues that we can try to address somewhat generically, and so they sent some good dialogue and we've sent them a very nice letter. There's a ML and we'll talk more about that in just a moment.

The other thing I wanted to talk about was kind of the back end of the fuel cycle. It's important for the agency that this be looked at comprehensively, and so you have to talk about shipping the fresh fuel, yes, burn it in the core, but we also want to make sure we're not forgetting about trying to ship out some of the spent fuel rods from the lead test assemblies to enable the destructive testing and get those to a lab where they can be analyzed to further the data story to get the safety case established.

And so we've had some outstanding interaction with GE on their GE-2000 package, a number of very substantive, detailed preapplication meetings with them to really clearly understand what they were going to be bringing to the agency, and so I want to put in a plug for substantive, detailed preapplication

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meetings whenever we can.

So I know this is a bit of an eye chart, my apologies. I think what I'm trying to communicate here is, so the agency has taken a step back and we've looked at kind of the path through the life cycle of this fuel and what the key milestones are from our perspective in terms of achieving success for a batch loading in 2023.

And so for that to happen, we've identified some key licensing actions that would need to occur, transportation packages, fuel fabrication amendments, and we've laid that out to try to figure out what the key milestones are. This is part of our letter back to NEI to explain what our need from industry will be for them to be successful to batch load in 2023.

And so this is in ADAMS. It's in the letter, and we can share that with you so you don't have to strain your eyes trying to look at that, but this is the analysis that the staff is doing to try to make sure we are enabling success there.

So if I could turn to the fuel cycle facilities for just a minute, part of our challenge is making sure we have up-to-date information with what industry is planning. For example, right now, we're not aware of any plans to enrich above five percent.

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If that were to change, we'd want to have good preapplication discussions on that.

I think there were some mentions yesterday about UF6 transportation, and so if there were changes in industry's plans, we'd want to know that very quickly, fresh fuel transportation and spent fuel transportation.

There are a number of good technical issues that we would like to have further dialogue on with respect to cladding integrity, and criticality, I have mentioned the criticality bench marking.

Let me take another moment on that. So the licensing strategy that any particular transportation or storage package vendor takes is up to them. There is flexibility in the regulatory framework to argue for safety in any one of a number of ways.

You can rely on the integrity of the cladding. Then you need data to demonstrate that safety. You can rely on the materials remaining subcritical, and then you need data to support that safety case.

So there is flexibility in the case you build and present to the agency, but you need different data depending on what your licensing strategy is, and

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so we are very much interested in having further dialogue with industry if their licensing strategies change.

So let me just wrap up and make sure I've hit all of my key points. So we think the current regulatory framework is flexible enough for these new technologies. We have identified some key regulatory actions that would need to occur, and we need industry to submit those applications on that timeline to enable the 2023 batch load goal that they've set, and we have undertaken some actions to improve our regulatory process, streamline, and make sure we are not an impediment to enhancing the safety of the reactor fleet.

And so I think with that, I am done, and I will turn it back over to Veronica. Thank you.

(Applause.)

MR. MONTGOMERY: Good morning, I am Bruce Montgomery with the Nuclear Energy Institute, and before I get started on the next topic, I'd just like to say I really appreciate the work that's happening at the NRC Staff these days with regard to improving the efficiency of our licensing process around CoCs, improving the 72.48 process, and what's going on in accident-tolerant fuels, so thank you to Jeremy, Jeremy, and John.

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I spent two years working on policy and regulatory affairs with regard to ATF, and I would like to really extend our appreciation on the part of the industry for the fact that you're looking ahead at our strategy and then planning ahead to what you need to do to enable it, because there's an awful lot of enabling activities at the commissions as you just went through.

Now, how many folks here have gone through a refueling outage a nuclear power plant? All right, a good number of you, so imagine you're working at a site like Vogtle a few years from now when all four units are up and running at 100 percent. Right now, the way things are contemplated, those plants would be on 18-month fuel cycles.

So who has worked at a two-unit site, both units on an 18-month fuel cycle and gone into refueling outages, all right? All right, those are challenging times. It's a challenging work environment to manage those outages.

So what we're talking about here with the accident-tolerant fuels, in addition to the better performance we have in terms of safety, with minor increases in enrichments, we can get all of our PWR fleet on 24-month fuel cycles. That means a lot to our workers out there across the industry.

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So imagine you're at that Vogtle plant. You've got four units that are on 24-month fuel cycles. Quality of life is going to be significantly improved. So this is very important, not only from a nuclear safety perspective.

There are performance enhancements as well with regard to being able to vary the power levels of our plants much more quickly than we could in the past. The fuel conditioning limits will be much improved and so forth, so lots of advantages.

So we're really excited about the future of our fuels. You know, we haven't touched our fuels for many, many years, decades, and now we're doing some things that we think will really pay off.

All right, so getting to the next topic, we have a real treat for you. It's my pleasure to introduce my esteemed colleague, Dr. Mark Richter, who is going to take you through a wild ride in the area of spent nuclear fuel transportation, well, maybe not so wild, but interested at least and maybe controversial.

But Dr. Richter has an interesting background. He's a senior project manager for decommissioning used fuel at NEI. He's got over 30 years of experience in nuclear energy.

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He's currently the project manager of NEI's used fuel transportation and consolidated interim storage task force, the used fuel working group, the dry storage task force, the dry storage vendor task force, as well as handling all of the materials aging and materials quality issues that come our way at NEI, so he's a very busy gentleman. So without further ado, I'd like to introduce Dr. Mark Richter.

(Applause.)

DR. RICHTER: Well, good morning, everyone. Before we get into the presentation, I would first like to thank the NRC for providing an opportunity for NEI, really on behalf of all of our industry members and colleagues, the opportunity to tell the story about this used fuel transportation tabletop exercise.

And as Bruce alluded, it may not be a wild ride, but we certainly believe it might be a safe ride.

Certainly that's our goal, so hopefully by the time the presentation is complete and we've had some discussion, you'll all walk away from here firmly believing that to be the case.

And I want to follow up with a comment that Chris Regan made earlier. 20, 30 years ago, the discussion and dialogue at a gathering like this was far different, I think, than the ones that we're hearing

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in recent years.

Especially in the last year and into this year, things are changing a little bit in terms of what the needs are in the used fuel world, both in regulatory space and in the ability to begin to take some actions around used fuel as more plants are shutting down for purposes of decommissioning.

You know, you've got a public that's becoming a bit more energized about some of these actions. There's a lot more discussion, a lot more energy around it.

It's sort of moved from a position of being in the back waters of the industry to being in the forefront in many different ways. So with that as a backdrop, let's get into the presentation.

You'll see here on the first slide a vision statement, "Prepare the industry to transport used nuclear fuel from reactor locations to consolidate it in interim storage by 2023." So what I'd like to do is just maybe take a few steps back and share with you how we got to this point while you contemplate all that's embodied in that vision statement.

Certainly we're all aware that two organizations are in the licensing process now to develop and build consolidated interim storage

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facilities in New Mexico and Texas. We know that there's a lot of stranded used fuel at decommissioned sites and at operating reactors.

Certainly before a site is fully decommissioned and that lovely green field is returned to the general public use, that ISFSI that's sitting in the back corner of the lot needs to be addressed.

So there's a lot of energy, a lot of motivation coming from a number of different directions to take the next steps to move used fuel, but on the other hand, there's a lot of energy and discussion coming from other directions that suggests maybe doing such a thing maybe isn't safe, maybe isn't appropriate, and maybe we don't know what we're doing.

So with that, we thought, well, on behalf of industry and with industry, how can we begin a dialogue that maybe demonstrates otherwise, that we do understand what we're doing. It has been done.

Certainly there's a long history of moving used nuclear fuel. I know the government and the United States Navy have done this. It's been done at other locations around the world, and truth be told, 20, 30 years ago, some of our domestic utilities moved fuel as well.

So there is some history. It hasn't

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necessarily been brought to the forefront, although that may be changing as we begin this discussion around the transportation of used fuel.

So, you know, NEI took a look at this and we thought, well, we have consolidated interim storage facilities under construction or at least in the licensing process as the initial step towards construction. We have a variety of locations around the country where there is used fuel, so, you know, what is the missing link? The missing link is transportation.

Certainly the CIS facilities will not be successful without the ability to move the fuel there, and if the CIS facilities are not constructed, there may not be a need to transport it.

So the two kind of go hand in hand, and I think, you know, you'll see as we go forward, their shared success is inextricably linked and, you know, I think it's important to recognize that.

So, you know, with such a large undertaking in front of us, and not a great deal of integrated industry experience, we began to contemplate, well, what will it take to really understand what it takes to move the fuel?

We certainly can't have a dry run, you know,

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physically, so we thought, well, maybe we could do a tabletop. You know, most of us in the engineering and regulatory community know what a tabletop is. We've certainly heard of them. A few of us may have observed one, but most of us have never participated in one, let alone developed one and executed it.

So we started looking internally at NEI at some of our emergency preparedness, emergency management security folks who have an incredible depth of experience both designing tabletops and executing them for some guidance in terms of how you develop one, build one, write a script, develop scenarios.

There's a lot of background logistics in pulling something like this off that's not necessarily apparent to the observer or even to some of the participants. So, you know, with that initial coaching from some of our own staff, we set about building this.

And early on in this process, we did have some discussion with DOE about participating in this, you know, understanding that DOE is part of the longer range plan of moving and taking responsibility for the nation's used fuel.

And I'm not going to speak at length about DOE's engagement at this point, but I'll just leave it that in terms of, I guess, appropriations and other

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directives for spending, I was advised that they were not really able to fully engage and participate at this point, but I do understand also that there's a lot of good work going on there in preparation for transportation.

So with DOE not being able to engage as a participant in this, you know, the industry contemplated that likelihood that we're going to have to use a private shipment, use private entities to take responsibility for the fuel and transport it to consolidate it at interim storage sites, so it's this private shipment model that became the core of what this tabletop exercise was all about.

And, you know, there was a lot of, at least internally at NEI, there was some discussion about, well, do we really want to do this because this could become potentially controversial? It may bring to light some things that we don't want to talk about just yet.

Because you're going to bring together stakeholders from a number of different areas that, at the very least, are not accustomed to talking to each other, may not even know each other, and may not even hold the same views and opinions on some of the technical issues or some of the regulatory challenges,

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or just even some of the more emotional aspects around used fuel in terms of where it's stored, how it's moved.

You know, these are things that was new territory for us and really new territory for most of the participants, but we moved ahead anyway and reached out to a number of our utility members, suppliers of dry storage systems, got a lot of support from state government entities.

I know Kelly Horn, the state of Illinois was key. We were able to get support from some consultants as well. A lot of people offered to help, and that was gratifying because I think as we got into this, it became more apparent that this may become an important thing and that we were really about to embark, I think, on an industry journey and begin a discussion that needs to take place.

And certainly I think by having this conversation begin now, we get a lot of the issues out on the table that need to be resolved, and waiting until the 11th hour is never a good idea, so we undertook this exercise.

So a couple of things we wanted to demonstrate when we designed this exercise, one is we believe that there's a lot of industry knowledge and

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proficiency that's out there right now, that there's not necessarily any new technology or new engineering that needs to be undertaken.

Certainly there's a long and safe history of transporting used fuel, nuclear waste with, you know, with essentially an event-free history, and that's something that I think we can build on and certainly leverage to our advantage going forward.

We do know that there was going to be a lot of stakeholder questions, certainly from state and local governments, but also from impacted communities in the vicinity of the transport route, in the vicinity of the ISFSI, and in the vicinity of the consolidated interim storage facility, and we wanted to be able to develop a message and communicate with them and make them a part of the discussion.

Certainly there is some information that can't be shared because it's part of safeguards, but to the extent that you can engage the public, inform them and let them be a part of the process, we thought that would be important.

And given that this was a tabletop exercise and not really a physical exercise due to the magnitude of the size, expense, and the overall geographic scope of doing something like this, we really wanted to focus

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on the things that we could replicate in a room, you know, similar to this.

And the things that are really important are the communication, the communication within organizations, the communication interfaces between organizations, especially between licensees and state and local agencies, regulatory agencies, and the communities.

These are groups that don't necessarily communicate about things like this on a routine basis, so this is all new. This is new territory, and to bring these people together, I think, was an important first step in demonstrating what it would take to pull off the transportation of used fuel.

And as I mentioned, without DOE involvement, you know, we are building what we refer to as a private shipment model, because absent DOE taking ownership of the fuel, the private industry and the industry community at large is going to take this on and make sure it happens.

So as I just mentioned, this private shipment model is really a new concept, and that really hit home early on in the development of the exercise because I think a lot of the state and local entities, the emergency management, EP community, security, were

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all under the impression that there would be funding for training.

There would be, you know, a wealth of federal resources and other resources available to support their efforts locally and at a state level to make this happen. That's really not going to be the case in the private shipment model.

So that immediately got their attention because I think they had this built-in paradigm after many years of discussion and belief that at some point, DOE would make this happen, that that was sort of their working understanding and their working model, so this was sort of a paradigm shift for them as well.

So this really then brings to light the need, the absolute necessity to begin a very early planning process. Identify who the entities are that need to be in communication and put them in touch with one another to begin a dialogue and establish a relationship.

You know, you can do this two ways. You can do it the hard way or you can do it in a way that makes sense, and that's getting the right people together to pull this off.

And, you know, one of the things that we realized too, that this exercise pointed out to us at

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least that it's really not about engineering right now, and it's not about regulation. It's really about relationships.

You know, the relationships have to be established early, especially with communities, and that was really driven home with the discussions we had with the Prairie Island Indian community.

The tabletop exercise was hosted at Prairie Island Nuclear Plant by Xcel Energy, and we heard last evening from Heather Westra, who works on their behalf.

You see how closely the ISFSI there is located to tribal lands and they need to have a seat at the table too, and that is just one example of the type of engagement that I think is going to be necessary.

You want communities, whether it's a tribal community or just a local neighborhood along the way, you want them to, if not be overwhelming advocates for what you're doing, at least understand what you're trying to do and have an understanding that what you're doing is safe. You know, it's for the greater good.

At some point, the fuel has to move and it will be moved safely to a location where it can be stored, you know, for the interim until the nation determines where the best permanent storage facility

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would be.

And it was sort of gratifying. After the tabletop was concluded, there was a lot of discussion that continued. I think different groups continued to look at each other to try and find some answers to questions about what's going to be required in a private shipment model and how can we do this?

So coming out of the tabletop, the questions were put to NEI, "Well, what are we going to do next? You know, how do we continue this conversation, this dialogue that we started with the tabletop exercise?"

And one of the things that we did, we informed the task force, the used fuel transportation task force early on, you know, to begin the preparation for this, but, you know, as we moved along through that and through the exercise itself, it became even more apparent about the link between consolidated interim storage and transportation.

So within NEI's organization, we put the two task forces together, you know, understanding that there's incredible overlap, not only in just the people, but in some of the needs and issues, so it made sense for us to do that.

So that was one step, at least from an

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industry standpoint, where we can sort of focus our efforts a little bit better than having separate, you know, siloed task forces.

Immediately following the tabletop, we had a lessons learned session where we got some immediate feedback from observers and participants.

We also conducted a webinar last month to just create another opportunity for folks that were there and maybe didn't get an opportunity to get their question asked, or maybe after a several month period of separation, they were able to contemplate, you know, some other questions, so we created that opportunity.

And we also created a video which I'm going to share with you here in just a moment. It's a short three-and-a-half minute video that sort of captures the essence of what the tabletop is about, what we're trying to communicate, and it's really designed to reach a general public audience. You don't have to be an engineer or a technologist to really understand it.

But we're trying to deliver a message that shows that, yes, the industry has the equipment that it takes to do this. There's industry know-how and expertise to do this. It's happening here.

It's happened around the world and it will continue to happen, and that hopefully this will begin

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a new conversation in the public that maybe moving fuel is really an okay thing to do and something that we ought to continue to think about.

So just a quick shout-out here before we start the video, I want to give thanks to the Sandie Labs. They provided some footage that maybe you've seen before. Orano has also provided some footage for this film, and then Xcel Energy did a tremendous job recording the live exercise and splicing this all together in a very professional way.

So with that as an introduction, let's see if we can roll the tape, as they say.

Stand by. The trouble's not in your set.

(Laughter.)

DR. RICHTER: We'll continue on until we get the video teed up here. Maybe we won't continue on because that's somebody else's presentation. I think I'll just step back here and let Haile resolve the issue. I was on such a roll, too.

(Pause.)

DR. RICHTER: Well, again, as we continue to work on the video, some of the lessons learned from the table top, we'll go ahead and discuss those now.

We had some objectives, some main objectives going into the exercise. And in terms of

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our own assessment as to how we did and what the table top accomplished, we tried to measure those against the four objectives. One of the things that we wanted to do, and I think the feedback we got would support this, was being able to show the key steps needed to safely and efficiently transport the used fuel from a nuclear site consolidated -- I'm sorry, an interim site to a consolidated facility.

I think at a high level we were able to do that. Certainly there is a million and one details to be worked out, but this was a first exercise, normal conditions of transport. We wanted to just demonstrate a basic process and that there was an understanding how to show that.

One of the things that we also learned was the coordination, planning, and communication are absolutely key. If you want to do this and do it efficiently and effectively, planning and communication early, absolute must.

We also wanted to show that this process is inherently safe and that there are regulations already in place that exist that will govern how this material is handled, how it's transported, how it's put back into the storage. That framework is already in place.

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One of the things that we only touched on briefly -- and this was a follow-on presentation at the exercise -- was contingency plans and emergency plans for disruptions in transport, such as protestors, or weather conditions, or you know, the flood took out some of the track. You know, things like that, how do we as an industry respond to that? What do the states need to do? What do the organizations involved in the transport need to do? We touched on that separately.

Future exercises may include a disruption in the transport where we can kind of take this to the next step and demonstrate how we would respond to something like that.

Another future step that I want to share here for those of you that may not be aware, and this is really gratifying to us, I think there was so much interest and awareness created at the state level during our table top exercise that the Council of State Governments, the Midwest Office, is putting on their own table top exercise in November at their Indianapolis meeting.

They're going to run an exercise that models a shipment from Big Rock Point south through the state of Kansas. It's going to consist of a short heavy-haul truck and then truck to rail. Their focus

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is really going to be between when the fuel is ready for commercial transport at the gate of the ISFSI to the -- I guess to the Kansas state line when it leaves the territory or the states that are part of their Midwestern Office.

Unlike what we did in our table top with a private shipment model, they're going to run it as a DOE shipment, but they're going to have certain points in the exercise where they stop and do a comparison and say, well, if DOE was handling this shipment, we would do X, Y, and Z. And if it was a private shipment the differences are A, B, and C. So it's going to be sort of a compare and contrast, knowing that at some point we need to be prepared potentially for a private shipment or a DOE shipment.

And I think for them, their drive was trying to figure out where the states fit in all this in either model. And that's something that, you know, is very important to them, the possibility of actually moving fuel coming up here in the next few years.

And one of the things, too, that I think is important just by them taking this on and doing it themselves I think that says a lot about maintaining the momentum and a desire on the part of other stakeholders to keep this conversation going.

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So a couple conclusions that I want to reinforce here. You know, we fully believe and firmly believe with the CIS in process these fuels are going to be transported with or without DOE involvement. It's going to move. We think there are processes and a history in place that demonstrate that it can be done and it can be done safely.

A regulatory framework is in place; we heard that discussed to some degree yesterday. And through our own learnings in the table top, that became apparent to us as well.

Like I said, it's not an engineering challenge. The tools, the technology, the physical know-how, the wherewithal to do this is already in place. Trust-based relationships, absolutely critical. I know Heather spoke to that last night, especially with a community that has concerns maybe at a cultural level or a historical level above and beyond the near term safety issues that may be present in that community as well.

So being able to reach out to them early on and begin a conversation. I hate to use the word "education." We learned last night that that's not something you necessarily want to say, but it's a matter of informing maybe more than educating.

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And I really think, too, as we go through this process as an industry, we've got to look at this holistically. You know, the decommissioned end state is a green field, right? It's not a green field with an ISFSI in the corner; it's land that can be repurposed for, you know, different use, whether it be another power plant, you know, a riverside development, you know, whatever, a school. Decommissioning includes removal of the fuel.

So I think that, I think, is really driving the other activities. And at some point, you know, how you handle the used fuel and decommissioning a site, it becomes the same thing. You know, and I think we're kind of reaching that nexus point now where we've got to be able to take the last step.

So that concludes my planned remarks as we wait here patiently.

(Laughter.)

(Off-microphone comments.)

DR. RICHTER: Are there any questions specific to the table top that you might want to ask now while we're waiting?

MR. RAHIMI: Mark, during this -- Meraj Rahimi, U.S. NRC -- during the table top exercise, did you folks touch on the emergency responder

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capabilities? As you well know, I mean, you know, in 180(c), that was one of the topics.

DR. RICHTER: Right. Yeah, we didn't look at that in detail. This initial exercise was more at a high level, just getting the right entities in the room and understanding how they would need to interface with one another is the level that we went.

I mean, we recognized that these capabilities, that aspect is very important. And I imagine the second table top that the Midwest States is putting together, that's really a state focus. And I think you'll get to that next level of detail in terms of capabilities.

MR. LLOYD: Tim Lloyd with Westinghouse.

Just a thought. I heard last night and I'm hearing now that this whole relationship building and seeing a person comes out and, you know, puts in the time, maybe even year after year, makes a really big difference. I want to ask if some deliberate thought had gone into getting, you know, maybe some people from the next generation, some younger people in anticipation it might be 25 years from now that we finally act on this stuff. It might be 20 years from now.

You know, is there an effort to bring in

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some people in their 30's or something to be there throughout the whole process?

DR. RICHTER: You know, I think your question really speaks to a broader issue in the industry, and that is bringing in younger people professionally to do this. I mean, we haven't taken any specific actions in the transportation area, but to that point I think it's important that some folks step up, or we identify some people to do that.

And I know that's been an industry challenge now for a while. You know, we've recognized it. You know, we try to make, from NEI's perspective do things in terms of outreach to colleges and community colleges and so forth that, you know, paint nuclear as a good and viable career. But in terms of recruiting people specifically from the younger generation for transportation, no, we haven't done that at this point.

MR. LLOYD: Yeah. It just seems like one area where maybe getting a person out in a role of just helping to organize and coordinate initially and be there. You know, they'll be able to say someday that I've been doing this for 20 years.

DR. RICHTER: Point well taken. Thank you.

MR. MUSSATTI: Okay. We have some

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flexibility here. So we don't necessarily have to, you know, end this at the time that it shows on the agenda. We've got a little bit of wiggle room in here.

So I'd like to open this up to more than just this one last presentation here for the questions so we can move on into that.

Sir?

MR. MAGGI: Hey, Mark. Roger Maggi, Orano.

I wanted to comment on what you had suggested about developing relationships with the communities and specifically around the table top. We all, those of us that were there at the table top obviously heard a very clear message from the Prairie Island Indian Community that candid, transparent, consistent engagement is critical, and their cooperation is really needed to help Xcel with their ultimate goal of moving that fuel from Prairie Island to interim storage within the next five years to begin that process.

And we're supporting them with that with our West Texas facility. But just to let you know, we are also taking leaders from the Prairie Island Indian community, along with Tim O'Connor, the CNO, and Chris Clark, the President of Xcel, we're taking

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them to Europe next week. And I'll be with them on that trip. We've got quite an agenda laid out that will show them how safely and I guess without interrupting local communities, small communities similar to theirs that are throughout France and Europe.

We are taking them to an interim storage facility over in Zurich, Switzerland to show them how those small towns have been unaffected, and actually very supportive over the years. So that outreach is now ongoing, and it needs to start happening everywhere.

I do think this is a good first step. And I think when we come out of this, the goal is to produce new advocates. And to the other comment about bringing younger people in, in meeting with Tim last week to kind of kick off, we just signed a long-term deal with them that supports the shipping, we all talked about how do we bring that community into the process of the transportation, including bringing, you know, young members from the Indian community into the process in an economic way. You know, provide economic benefit to the community in an area where you don't have to have a nuclear engineering degree to be very productive in that process.

So I just want you to know that stuff is very important, and it is ongoing.

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DR. RICHTER: I appreciate that. And I wasn't aware of that. But it's a very good thing to know, and I'm really happy to hear that. And I think that just, again, demonstrates, you know, this conversation that has started, you know, back in May with this table top continues now in a lot of different directions. It has some momentum of its own. And we're just very gratified to see it continue. So I appreciate that feedback. Thank you.

MR. MUSSATTI: Okay. We have two more questioners at the microphones in the room. And if we don't have the video by then, we'll take a look the telephone.

So there you are, sir.

MR. PHEIL: My name is Ed Pheil from Elysium Industries speaking to pseudo-Marilyn.

(Laughter.)

MR. PHEIL: We are doing an advanced reactor that basically uses spent fuel and plutonium as our fuel, right? So that means you take that spent fuel, you split it open, and you pour it into a molten salt bath, mix it up. And you pour it into a shipping container and ship it to a reactor, melt it, and dump it into the reactor.

Are you looking at those on the licensing

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basis for advanced fuels, and for that matter for shipping in shipping containers and storage?

Even so, ours is a little bit different than others in that we do it on the front end of the cycle because we're consuming nuclear waste, but all the MSRs are going to be doing such shipping at the end of the fuel cycle.

MR. MCKIRGAN: So thank you. I appreciate -- I appreciate the question.

I would urge you -- I'm going to go back to my key message -- please come in for a pre-app discussion. Always happy to have those discussions.

I'd also be happy to point you to our folks in the Office of New Reactors. I think they might have an interest in having pre-application discussions with you as well. If you haven't already engaged with them, I can give you some contacts there.

Certainly when I look at the full spectrum of advanced reactors there are -- there is some flexibility in the regulatory framework. Your condition sounds a little unique and it might require some further dialogue so that we can more comprehensively understand the approach you're taking, what transportation and storage packages you're looking at, what vendors you might be in dialogue with on how

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to do that.

There is always the possibility for exemptions, orders. There is a fairly full suite of regulatory tools in our toolbox that we can use to enable activities that are going to enhance safety or enable new technologies. I would just encourage you to come in for a pre-application. You can find my name on the website, or I can -- we can talk offline.

MR. MUSSATTI: Sir?

MR. GUTHERMAN: Thank you. This is Brian Gutherman. I have one question for each of the Jeremys. I'll be glad to split them for shared time.

This one is for Jeremy Tapp. The industry is really looking forward to this revision to reg guide 3.72. Will there be any exceptions or clarifications in that reg guide revision?

MR. TAPP: I'll have to get back to you.
(Laughter.)

MR. TAPP: I'm sorry. I'm not aware. I'm not the one that's, you know, been working on this. So I don't know if anyone else in the room has that information, but I will definitely get back to you.

MR. GUTHERMAN: Okay. There aren't any right now. I should clarify that. The only one right now is the exception to the appendices in 97 -- 96-07.

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MR. TAPP: Yeah.

MR. GUTHERMAN: My second remark is more of a comment than a question. But in my experience looking at 72.48 inspection reports and violations, it appears to me there is a blurring of the lines between violations of 72.48 and violations of the design control process.

And I would just encourage your inspection procedure and your training to make sure that's clear when an inspector finds an issue that they distinguish properly between something that really ought to be under design control in the QA program versus a 72.48 violation. Thank you.

MR. MUSSATTI: Were you done or were you stopping because of the video?

MR. GUTHERMAN: No, I'm kind of done.

(Laughter.)

MR. MUSSATTI: You're kind of done? I didn't think you'd be done that quickly.

MR. GUTHERMAN: I have another comment, but I didn't want to be obtrusive.

MR. MUSSATTI: They're still setting up.

MR. GUTHERMAN: Okay. I'm going to go to comment number two then.

This is for Jeremy three. And I appreciate

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your forbearance here. I was really happy to hear you use the phrase "reasonable assurance of adequate protection." I think it's the first time I've heard it in two days. But that should be a mantra that transcends everything we do because there's a lot of stakeholders outside of this group in this room who expect zero.

We don't have zero. Engineers don't work to zero. There's no zero risk. There's no zero dose.

So we have to make sure we don't forget that, otherwise we start chasing zero and we'll never get there. Right?

But my true question is, updating 17 -- NUREG-1745 in the SRP, is there going to be anything in the interim, because those activities are going to take some time, that says we can use the precedent being set by the Amendment 16 to the NUHOMS certificate so other certificate holders can go use that?

MR. SMITH: Okay. Yeah, I appreciate the question. I believe that the intent is that NEI is developing a white paper right now to kind of transition before we actually get a chance to revise NUREG-1745.

Once we have a chance to look at that, and review it and endorse it, that would be the marching orders.

MR. MCKIRGAN: I'm sorry. John McKirgan.

Brian, I'm going to offer some additional

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thoughts on that point. Right?

And so, many of the things that are being done in that pilot can be done now by every vendor without revising the NUREG. The strategies that are being employed are already in some very small cases being implemented in some of the amendments that we see coming in. And so I'm very excited to see the other vendors picking some of those elements.

That's not to say that, you know, the comprehensive look through all of the tech specs that occur in the pilot is key, and that will get us the most benefit. But I do not see that the industry needs to wait for an endorsed guidance to start to implement those things that are currently authorized.

MR. GUTHERMAN: Yeah. I would add that I think what you're talking about is akin to the line item improvement process for tech specs on the Part 50 side.

MR. MCKIRGAN: Yes.

MR. GUTHERMAN: Plucking those things out and doing it properly one by one.

Thank you.

MR. MUSSATTI: Okay. We are going to go to the video now, which is a relief to me because I had just heard a moment ago that NEI was planning on

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presenting the video in interpretative dance.

(Laughter.)

MR. MUSSATTI: And I didn't think that that was going to go over very well. But here we are.

DR. RICHTER: That probably would have not gone over very well.

(Video played.)

DR. RICHTER: So hopefully you all found the video informative. And in the very near future, we'll have it available on the NEI website. It's our hope to make this broadly available to interested communities, individuals, organizations.

If you have trouble accessing it, please contact us. We'll try and make sure we can put it in a format that makes it accessible and readily available for your use. And again, we hope that this is a useful tool in continuing the dialogue that started back in May. Thank you.

MR. MUSSATTI: Thank you for that. I'd encourage you to get a copy of it to Haile so that he can put it on the NRC's website as well for folks.

All right. I promised that after the two people that spoke before the video that I would go and ask if there are any comments from the phone.

Operator, have we got any comments on the

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line?

OPERATOR: At this time I see no questions over the phone line. But if you'd like to ask a question, please press star one, and record your first and last name.

MR. MUSSATTI: Okay. Thank you. I'll check back with you in a minute.

There is somebody else here. There you go, sir.

MR. WALDROP: Keith Waldrop, EPRI. My comment is to Jeremy three. I was encouraged by your presentation. I liked hearing this. We've been talking about risk informing, risk insights for a long, long time. And I think it's well overdue.

There's a lot of things going on, and in the next panel Bob Quinn will be talking some more about it. Maybe, just maybe the time is right that we can really take this seriously and try to implement this.

And so as you look at your risk process methodology going forward, a couple of things to keep in mind.

One is as some other activities, start with a clean slate. What's important is you can look at the evolution of, in particular, ISGs. How did we get here? You know, ISG-11 on cladding property that

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ignored high burnup fuel because there wasn't a lot of information back in 2003. Well there is now, so we can better inform that.

Moderator exclusion also had some comments in there about lack of material property data. Well, that exists now. So we need to make sure to start, as we risk inform, risk inform from the context of where we are today in our current knowledge.

And the second thing, to make this the most useful I would encourage, I don't know what kind of team you've already formed, but get staff members involved. Because ultimately where the rubber meets the road is the staff members are going to have to be the ones to buy into this and to really want to use those risk insights going forward instead of doing things the same way or that we're comfortable doing it. That's going to be a tough shift, but get their involvement involved early and get some buy-in.

MR. SMITH: Thank you very much for the comments. Appreciate it.

MR. MUSSATTI: All right. I had seen somebody earlier that was standing up and getting ready to go to the mics. All right.

MR. PHEIL: Ed Pheil from Elysium Industries. On the subject of accident-tolerant fuels

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there was a comment made earlier that they could extend the refueling time period to from 18 months to 2 years.

So that's an economic cost savings to do that.

But to get there you're actually getting higher burnup, where the original design of the accident-tolerant fuel was intended to give you more coping time for it. So getting higher burnup is reducing that coping time. And the cost of the fuel is higher than the cost of existing fuel.

Is there an economic basis that we've looked at to justify the ATF fuel for doing this accident-tolerant fuel, considering that the existing fuel hasn't harmed -- hasn't killed anyone?

MR. MCKIRGAN: So thank you. John McKirgan again. That's a great question. I'm going to take a part of that question, and I might defer to my industry colleagues to take the other part. Right?

So the agency's motivation here is safety.

And we're looking for a demonstration of safety. Some of these technologies do have the potential to enhance the safety of the reactors, and that's what we're interested in.

I think you touched on a number of points.

And I will share with you my own perspective as the accident-tolerant fuel interests and initiatives have

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progressed. You may have detected rightly, there has been a bit of a shift and a modification in the industry's approach. And I will defer to the industry later on this.

The first discussions of accident-tolerant fuel were different cladding types. Copping time was certainly a key thrust there. And I believe as that work progressed and as industry gained additional insights into the cost benefit -- and again, I'm going to defer to them in a minute -- I think there was a realization that there were other, other factors that would enable this safety enhancement. And the longer time between refueling outages was a key one.

And so I'm going to pause here and let industry speak to the more comprehensive economic benefits. The agency's perspective is safety, demonstrate safety, enable through efficient licensing actions the ability of industry to get the flexibility that they need to achieve.

So let me pause there and let -- NEI's dying to jump in.

MR. MONTGOMERY: Yeah, thank you, John. Bruce Montgomery, NEI.

As John pointed out, initially when we were getting into this enterprise around accident-tolerant

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fuels, there was a lot of excitement about having coping times that were extensive hours and hours. As we got into it more deeply we found that maybe the coping times were not as great as we had hoped for. But there are still benefits on the safety side.

I mean, I grew up at a plant, had a lot of grid-to-rod fretting and fuel failures that impacted plant safety, occupational exposure, and whatnot. These cladded -- coated clads are going to help us greatly in that arena in terms of providing more robust protection against grid-to-rod fretting and fuel clad failures. We will get additional coping times. I'm sure there's going to be some extent of that.

But, as John pointed out, as we got deeper and deeper into this we started to realize the operational flexibility benefits of accident-tolerant fuel. I like to call it advanced technology fuel. But what we were seeing here, and if you talk to a guy like Danny Bost at Southern, he's very excited about getting his fleet on 24-month fuel cycles.

The quality of life impact, the impact on plant economics, it's huge in these days, if you could reduce your operating costs it helps us hedge a little bit against the market pressures that we face day in/day out.

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But there's other things that are coming to light too, and that is the ability to potentially wrap power -- ramp power levels. The fuel conditioning constraints are reduced with these new fuels. And if we can become a better partner for the renewable community, that's a great plus for us in the nuclear community because we think there's a lot of future there for us to team up with the renewable community in terms of the future grid.

So operational flexibility, better economics, and improved safety as well.

MR. PHEIL: Can I jump in real quick? Those of us, the questions along the line is I'm all for improving the economics, but the fuel is more expensive, so you have to overcome that with economics before anything else. And I'm not really interested in improving safety anymore because we haven't harmed anyone. So will this fuel be allowed to extend the safety margin to improve the economics of nuclear so we actually have nuclear to go forward?

MR. MONTGOMERY: So let me answer that because what you're -- what you're really asking is what is the market going to do? Right? So this is we're in a commercial market so when -- you can see Exelons and Southern and others putting these, these

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lead test assemblies in to check them out. Your question is, yes, it's going to be more expensive fuel.

So who's going to buy the first full batch and load? And that will be the indication, it will be the answer to your question of is this really going to be attractive enough economically to see these big buys?

I suspect it will be. The guys operating these fleets are very excited about the idea of being able to take all these P's and put them on a 24-month cycle like the B's are. There's a lot of economic benefit to doing that in addition to just how to manage your site for these multi-unit sites.

So my prediction is for at least these multi-unit sites these bigger fleets are going to see significant purchases down the road once these fuels are demonstrated as viable.

MR. CSONTOS: So this is Al Csontos from EPRI. I'm the tech lead for ATF at EPRI.

There are three reports that are tied to the economic benefits case, our economic business case for higher enrichment, higher burnup. There's one publicly available report on the ATF business space or business economic and safety benefits.

And there are two NEI reports that are tied

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that summarize that into, you know, I guess it's layman's terms. Okay.

The bottom line is is that for going to a 2-year cycle, all right, and you go to a small increase in enrichment to get the higher burnups -- you're correct on the burnups -- you're looking at \$9.4 billion of savings for the fleet over an 80 year, for the 80 year -- remaining 80-year life of a plant. Okay? It makes the case to go to subsequent licensed fuels better because your economic business case is there.

For the back end of the fuel cycle, the savings is about \$3.5 billion just only in the reduced number of canisters that you would need to have. Okay?

If you add in transportation, interim storage, transportation, disposal you can -- we did not go there because those are all too iffy, all right, in terms of getting some, you know, plans or how to break it down. But you can see how much that's going to be. Okay?

And so the mantra that we have or the communications that we have is ATF provides you the additional safety barriers and the safety, the robustness of the fuel, the cladding, to allow you to go to the higher burnups. Right now NRC limits you to 62 gigawatt-days per metric ton of uranium because

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of the issues with, you know, concerns with cladding performance and such at higher burnups.

But the coatings in particular, what we've seen in terms of testing is how much more robust they are just with a few microns of chromium on them. Okay?

And so that enables you, that gives you the greater margin to then take it to higher burnups that allows you the higher enrichments that gets you these numbers I told you.

So you can download those from EPRI's website and also NEI's website.

MR. MUSSATTI: Thank you. That same comment there was just presented to us over Skype that there are some reports that are available. I hope that's what he was referring to. They weren't cited on the Skype, but it seemed kind of timely there.

I want to go to the phones for one minute just because they, we haven't heard from them in about two complete sessions. So operator, have we got anybody that wants to speak?

OPERATOR: We do. We have one question from Donna Gilmore. Donna, your line is open.

MR. MUSSATTI: Hi, Donna.

MS. GILMORE: Hi there. On the burnups, obviously you're doing ATF for high burnups. That was

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pretty obvious from Westinghouse's advertisement on their website more than anything else.

On the uranium pellets, you're testing the cladding to see how it holds up. Are you also testing the uranium fuel to see how those higher burnups were going to increase the hydrides in there and how that's going to affect everything, or are you ignoring the hydrides -- the uranium part of the testing?

MR. MONTGOMERY: Yeah, Bruce Montgomery.

I'll take a shot at that.

Yes, there is some testing going on by virtue of the fact that some of the lead test assemblies that are currently being loaded in a couple of plants, one version is a chromium-doped uranium-oxide fuel pellet. Another is a uranium-silicide fuel pellet. So those tests are ongoing explicitly, not just to take a look at the performance of the cladding, but also the performance of the fuel pellets and the interaction between the pellets and the cladding.

MR. MUSSATTI: Do you have a follow-up?

MS. GILMORE: Yeah. What is the burnup that you're testing on those?

MR. MONTGOMERY: Well, I would imagine that once those assemblies go through their three cycles of operation that, you know, once pulled out of the

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reactor and sent to the labs for analysis that, yes, we'll have data available to us in terms of the impact of that higher burnup. But I'm not sure what --

MS. GILMORE: Then I'm confused. What would that higher burnup be in that test you're talking about?

MR. MONTGOMERY: Yeah, I'm not knowledgeable enough to really tell you what burnups we're going to achieve in these three cycles. But I don't think that they're going to be at the levels that we're contemplating in the future.

MR. McKIRGAN: If I could, John McKirgan for the NRC. I would offer a couple of areas to look at. I think if you were to track some of the licensing actions that are going on with the staff, the GE-2000 package is one that is being discussed to ship some of these spent lead test assemblies. And so Donna, you would be able to monitor the staff's actions on that review and see what the limits are that are being established in that.

That, I think we're still in pre-app there, or we just recently received that application. But we will always make portions of those SARs publicly available. You'll also be able to monitor the staff's RAIs as that goes through its licensing life.

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And, again, you can always monitor the other licensing actions that come through related to ATF. And I think that would be one way to see, at least from the agency's perspective, what the limits are that are being considered.

MS. GILMORE: Well, you know, as Al has said in previous meetings, because I've been on some of those calls, if you don't get the higher burnup the SMRs are not really viable from an economic standpoint.

I'm just concerned that you already have damaged fuel and hydrides building up in this fuel, and now we're sitting here with this waste that's more unstable and less safe for transport. And instead of solving those problems, you want to double and quadruple down on burnup. I'm very concerned that this is extremely unsafe.

MR. MUSSATTI: Okay, Donna, I've got several people in the room that would like to speak.

If you would -- if you want to say anything more, could you wait till towards the end? And I'll ask the operator one more time before we make a break.

MS. GILMORE: Yes. I'm done. I'm done, thanks.

MR. MUSSATTI: All right. Thank you very much. Sir?

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MR. WISE: Hi. This is John Wise, the NRC.
I'll keep this brief.

I had a question, but Roger Maggi kind of answered that question when he chimed in on bringing people over to Europe to see the experience of transporting fuel there. Because my initial question was to what extent are these table top exercises informed by the actions in Europe, in particular France?

And I say that because I had an opportunity to hear a presentation about France's experience with transporting spent fuel earlier this year at the IAEA Spent Fuel Conference, and even I was caught off guard about as far as really the significant number of spent fuel storage shipments that have been occurring in France for the last 40 years.

And a very nice presentation was given at that conference, which I believe is publicly available, that describes the sheer numbers of shipments and the most significant events that occurred. And I just think that I'm just going to make this a comment. I think there's an opportunity when you're engaging with the affected communities and the public for really bringing up the operating experience and lessons learned from France in particular.

DR. RICHTER: I'll just make a follow-up

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comment. And thank you for that.

Yeah, the table top exercise that we put together was really a very basic, fundamental look at process and trying to identify the organizations and the entities that needed to engage to be successful and, you know, try and pinpoint some of the key communication interfaces and so forth. That particular exercise was not necessarily informed by the European experience, although I think as we go forward, not just NEI but industry at large and what Roger spoke to I think helps move us in that direction, reaching out and gaining a greater understanding of what's going on in Europe and other places where they have considerable experience moving commercial fuel.

You probably noted in our video you saw an Ensa cask in motion. And that was traveling around Europe on a long journey, which you may have heard more about in previous conferences and different times and places. But I think as the industry moves forward, I think we're going to be relying on identifying best practices and technologies that work the best and try to replicate those and demonstrate them.

MR. MUSSATTI: Okay. Are there any more comments from the room? Okay, one more here.

MS. LEBLANG: Suzanne Leblang from

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Entergy. I also have a comment type question, I guess, for Jeremy number three.

Tech specs. So I would also encourage or ask that as you look at this effort that you also consider who is going to use or perform the action in the tech specs. An operator or someone that is going out to do the visual inspection of events should not need to know which of the six types of material the canister was made from, or the 25 options for how it was loaded. So I just encourage you to also consider when you're looking at writing those who might be using and performing that tech spec.

MR. SMITH: Thank you very much for the comment.

OPERATOR: Excuse me. There's one more question over the phone line if you care to take it.

MR. MUSSATTI: Okay. We'll go now.

OPERATOR: Thank you. The question comes from Marvin Lewis. Marvin, your line is open.

MR. LEWIS: Yes. Look, I'm an engineer with 60 years as a professional engineer, many of them in corrosion risk and related subjects. Here's my problem. And maybe this is not only my problem; maybe it's other people's problems.

Your answer always seems to be sharpening

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of pencils. In other words, you're doing the test, you're getting numbers, which has wonderful little numbers, but they are numbers. When we're talking about accident-tolerant fuel we're talking about fuel that's out there that's being handled -- that's being handled perhaps maybe not exactly as you assume in regulations. And you're looking at hydrides, the orientation of the hydrides, as Donna Gilmore was relating.

There's a lot of experience and a lot of reasons to suggest that maybe those wonderful sharpening of pencils and this wonderful analysis, and that wonder of this, that, and the other thing may not be giving the NRC the true picture, the true numbers.

And it goes on and on.

I don't want to go through any of the examples I gave you yesterday. But again, I repeat, there are examples. And the NRC seems to be very experienced at ignoring the real willow. Thank you, bye.

MR. MUSSATTI: All right. Thank you for your comment. Is there anybody else on the phones that would like to speak?

OPERATOR: At this time, I show no further comments from the phone line.

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MR. MUSSATTI: Okay. And I don't see a great horde of people running to the microphones in here either. Have we sort of reached a stopping point?

(No response.)

MR. MUSSATTI: Going once.

OPERATOR: One more question has queued. Would you take it?

MR. MUSSATTI: All right, go ahead.

OPERATOR: Thank you. From Donna Gilmore. Donna, your line is open.

MS. GILMORE: Yes. Regarding transports, I've talked to the vendors that do transport in Europe, and they always inspect the fuel and the container before the transport. And the NRC has recently approved the Holtec thick-walled cask, or transport cask which only requiring checking radiation levels and not checking the container or inspecting to see if the high burnup fuel has become damaged in dry storage.

Now, I know the NRC engineers want to do the right thing. I've seen your RAIs. But management is overruling that. And I think this is the number one problem that needs to be solved. And all I can see from these last two days of meetings is how we really don't have an NRC protecting us anymore; we have the

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nuclear industry only concerned about profits. And that's all I have to say.

MR. McKIRGAN: Ms. Gilmore, John McKirgan again. Thank you. You know, thank you for the comment. I do appreciate, you know, there are some differences in the regulatory structures between how the NRC regulates domestically and what foreign regulators do. I do always want to be mindful of the multi-pronged approach to safety that the NRC has. Certainly we do a great deal of work in licensing to ensure that the transportation packages are reviewed and certified and that the limits and conditions under which safety is assured is clearly articulated in the certificate of compliance.

I'm also very mindful of the wonderful work the NRC does in its oversight program where -- and this is a slightly different model than what's done in Europe -- but we have an oversight program. We do inspect the vendors that fabricate the packages. We look at their supply chains. We look at their quality assurance programs.

We also have a wonderful oversight program where inspectors observe loadings. Loading campaigns are looked at very carefully. And certainly we have had issues there, and we have taken action as a regulator

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to ensure that those actions are done safely and that lessons are learned and corrections are made.

So I appreciate the regulatory frameworks are a little different, but I am confident that the regulatory framework we have established domestically ensures safety.

And I'll go back to reasonable assurance of adequate protection. I know different people can certainly have a different belief and understanding of what that means, but I think the regulatory framework and the documentation that we've established is stating what the agency's position is, and our licensing and oversight programs are designed to meet that standard.

MS. GILMORE: So you're telling me a company that gouges every single canister they put in a container and almost drops the canister 18 feet twice, and also changes the basket design where pins are falling out in transport even when the darn thing is empty, you're telling me that's an example of how the NRC does its job?

I agree that is an example of how the NRC is doing its job in that example. So it isn't about views; it's about what's actually happening on the ground. Thank you.

MR. MUSSATTI: Okay. We have somebody

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that's instant messaged us from Skype. And he says it's important to note that 10 C.F.R. 71.87, routine determinations, requires that prior to shipment, A) the package is proper for the contents to be shipped, and B) the package is in unimpaired physical condition except for superficial defects such as marks or dents, among others. I think that was appropriate.

All right, any questions in the room? Well, I think we have --

OPERATOR: One more on the phone.

MR. MUSSATTI: Excuse me? One more time.

OPERATOR: One more on the phone.

MR. MUSSATTI: Okay. Caller, please.

OPERATOR: Yes. Kayleen Walker, your line is open.

MS. WALKER: Yes, thank you. I just wanted to add to the list of things that Holtec has done that the NRC has responded to by not responding.

At Diablo Canyon, over half the canisters were improperly loaded. And so once the canisters are welded shut, what were they to do except let it be and accept it as not a problem.

And so basically that's what Donna Gilmore was speaking of. It's that, yes, that problems are revealed, and the NRC has just let it slide. So we

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have half the canisters at Diablo Canyon improperly loaded, and they're still improperly loaded. And there was no way for them to unload them and load them properly.

So I think that the criticism of the NRC is valid and should be looking at how you're actually regulating the regulations, enforcing the regulations.

Thank you.

MR. MUSSATTI: Thank you.

MR. McKIRGAN: Ms. Walker, thank you. John McKirgan. I appreciate, I appreciate the comment.

I don't have those inspection reports in front of me now, but I do believe there are inspection reports available to discuss those matters.

You know, the issues that you raise resonate a little bit with me with respect to Mr. Lewis' comments about document error. I believe the regulatory framework and the oversight infrastructure that we have does acknowledge the fact that there are occasionally human errors involved. And what the agency seeks to do is ensure that the licensees assess and take corrective action.

They also have to assess these conditions.

If there is a canister that's in a degraded condition, or if there has been an issue during loading that was

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later identified, the agency through our oversight program goes back and ensures that the licensees have taken corrective action and ensured that the canisters are returned to compliance with the CoC.

I think the inspection reports try to capture those. And there are often follow-on actions that the licensees have to take in their corrective action program. And then the agency goes back again in a subsequent inspection to ensure that those corrective actions have been completed appropriately.

So I can't speak to the specifics of the item you're referring to, but I think our inspection reports are publicly available, and you could find them on the public website.

MS. WALKER: Am I still on?

MR. MUSSATTI: Yes, you are.

MS. WALKER: Thank you. Well, if you can inspect something and then, you know, you're saying the licensee, but actually we're talking about the vendor as well. And I mean, Holtec seems to have some pretty chronic problems. And the licensee is held accountable, but the vendor, there is no way that they can correct the problem of an incorrectly loaded canister. There's no way for them to inspect the fuel of a dropped canister.

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I mean there's something missing in the overall regulation and defense in depth of dry storage.

I mean, it's when you look at the whole picture, not just the inspection part of this and that, but you look at the whole picture and the NRC's supposed to be considering this from cradle to grave. And we're not even 30 years in and the problems, we don't have any path forward for dealing with canister problems.

And to assume that there are not going to be any problems with the canisters would be seriously misguided. Thank you.

MR. MCKIRGAN: Thank you. Thank you for the comment.

MR. MUSSATTI: Okay. At this time I think I'm going to nip this in the bud seeing as we're on schedule almost exactly. I'd like to point out that I'm a trained facilitator, and that's my job.

(Laughter.)

MR. MUSSATTI: You've been a great audience this morning. And as soon as we come back from lunch, you're going to be a great audience again.

So let's call this to an end and go have lunch.

(Whereupon, the above-entitled matter went off the record at 11:12 a.m.)

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