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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

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SUBCOMMITTEE ON METALLURGY AND REACTOR FUELS

+ + + + +

TUESDAY

DECEMBER 3, 2019

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ROCKVILLE, MARYLAND

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The Subcommittee met at the Nuclear Regulatory Commission, Two White Flint North, Room T2D30, 11545 Rockville Pike, at 1:00 p.m., Ronald G. Ballinger, Chair, presiding.

COMMITTEE MEMBERS:

RONALD G. BALLINGER, Chair

JOSE MARCH-LEUBA, Member

JOY L. REMPE, Member

DESIGNATED FEDERAL OFFICIAL:

CHRISTOPHER L. BROWN

1 NRC STAFF PRESENT:

2 JOSEPH F. BOROWSKY, NMSS/DFM/CTCFB

3 YOIRA K. DIAZ, NMSS/DFM/CTCFB

4 DARRELL S. DUNN, NMSS/DFM/MSB

5 ELIEZER B. GOLDFEIZ, NMSS/DFM/NARAB

6 MERAJ RAHIMI, NMSS/DFM/MSBJD

7 CHRISTOPHER M. REGAN, NMSS/DFM

8 ANTONIO B. RIGATO, NMSS/DFM/MSB\*

9 JEREMY A. SMITH, NMSS/DFM/NARAB

10 JORGE SOLIS, NMSS/DFM/CTCFBCH

11 TRAVIS L. TATE, NMSS/DFM/NARAB

12 BERNIE WHITE, NMSS/DFM/STLB

13 VERONICA M. WILSON, NMSS/DFM/NARAB

14

15 ALSO PRESENT:

16 MARK RICHTER, NEI

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18

19 \*Present via telephone

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C-O-N-T-E-N-T-S

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

(1:01 p.m.)

CHAIR BALLINGER: This meeting will come to order. This is a meeting of the Advisory Committee on Reactor Safeguards Subcommittee. I am Ron Ballinger, Chairman of the Metallurgy and Reactor Fuel Subcommittee. Members in attendance are Jose March-Leuba and Joy Rempe. Chris Brown is the designated federal official.

The purpose of today's meeting is for the subcommittee to receive a briefing on staff's development of NUREG-2216, standard review plan for spent fuel transportation and radioactive material. Today we have members of the NRC staff and Industry to brief the subcommittee.

The ACRS was established by statute and is governed by the Federal Advisory Committee Act, FACA. That means that the committee can only speak through its published letter reports. We'll hold meetings to gather information to support our deliberations. Interested parties who wish to provide comments can contact our office requesting time. That said, we set aside ten minutes for comments from members of the public attending or listening in to our meetings. Written comments are also welcome.

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1           The meeting agenda for today's meeting was  
2 published on the NRC's public meeting notice website,  
3 as well as the ACRS meeting website. On the agenda  
4 for this meeting and on the ACRS Meeting website are  
5 instructions as to how the public may participate. No  
6 requests for making a mistake to the subcommittee has  
7 been received from the public. A transcript of the  
8 meeting is being kept and will be made available on  
9 our website. Therefore we request that participants  
10 in this meeting use the microphones located throughout  
11 the meeting room when addressing the subcommittee.  
12 And when you do that, make sure the green light is on  
13 when you talk. Participants should first identify  
14 themselves and speak with sufficient clarity and  
15 volume that they can be readily heard.

16           We have a bridge line established for the  
17 public to listen in to the meeting. To minimize  
18 disturbance, the public line will be kept in a listen-  
19 only mode. To avoid disturbance, we request that  
20 attendees put their electronic devices like cell  
21 phones and other things that make noise in a noise-  
22 free mode.

23           We'll now proceed with the meeting. And  
24 I'll ask Chris Regan who's over there, Deputy Director  
25 of Spent Fuel. Any introductory remarks to make

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1 before we begin today's presentations? So Chris.

2 MR. REGAN: Good afternoon. Thank you  
3 very much for the introduction. I first want to say  
4 thank you very much to the subcommittee for your  
5 interests in our work in the Spent Fuel Program. We  
6 have been doing a lot of work to establish and  
7 basically you know, update our current regulatory  
8 framework, the guidance that we have on the books at  
9 the moment as we move forward facing a whole host of  
10 new challenges. You'll see and hear from a fair  
11 number of the Division of Fuel Management staff, each  
12 in their own specific discipline of expertise as they  
13 walk through each element or each part of the revised  
14 standard review plan.

15 I wanted to mention that the scope of this  
16 effort was largely and primarily a consolidation of  
17 existing guidance. If I go back in my time machine  
18 and look at the last time we updated the SRP, it would  
19 probably be a fair number of years ago. Given the  
20 magnitude of the effort, we took some time to come to  
21 a point where we reach critical mass. And said okay,  
22 now is the time we need to revise and update the SRP.  
23 And finally made the decision that, that's what we  
24 were going to do. And has brought us to where we are  
25 today. So it's really a consolidation of existing

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1 technical guidance we have on the books. Technically  
2 there is nothing really new here.

3 We do plan to continue our efforts to  
4 improve the staff guidance. This is just the first  
5 step in the process. I know that the subcommittee and  
6 the full committee has interest in risk informing our  
7 program. And that is definitely one thing on our  
8 radar of what we are interested in doing when it comes  
9 to our regulatory guidance. And we're continuing to  
10 look for opportunities and identify where we can use  
11 risk insights to inform our guidance.

12 We have already, I wouldn't say fully  
13 completed, but we have significant milestones achieved  
14 in a couple areas relative to where we have leveraged  
15 risk insights. One of which is the graded approach  
16 for storage certificates -- content in the certificate  
17 and the Tech Specs itself. We have an interest in  
18 incorporating the lessons learned from that into our  
19 guidance at some point in time in the near future.

20 And also recently as of November, we  
21 received a letter from NEI looking at assessing  
22 performance margins. And that will -- in and of  
23 itself, that effort as we walk through each of their  
24 recommendations in that letter, for sure include  
25 assessment and consideration of risk insights. So

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1 that's another piece of data that will inform how we  
2 move forward on improving our guidance to incorporate  
3 risk insights.

4 I didn't have any other remarks. I would  
5 like to thank the staff for their efforts pulling it  
6 together. I know it's been a long road on the SRP.  
7 And with that, I will turn it over to Jeremy Smith who  
8 will lead off our presentation. Thank you.

9 CHAIR BALLINGER: Do I understand that  
10 there's a staff person on the line?

11 MR. SMITH: That's correct.

12 CHAIR BALLINGER: Are you going to present  
13 the first slide after this?

14 MR. SMITH: After my introductory slides.

15 CHAIR BALLINGER: Okay.

16 MR. SMITH: These are the first technical  
17 --

18 CHAIR BALLINGER: Go ahead.

19 MR. SMITH: -- person that will be  
20 speaking. So thank you for having us here today at  
21 the subcommittee briefing. Like Chris had mentioned,  
22 this has been a long effort to consolidate guidance.  
23 And you know, we welcome any questions you might have  
24 on the progress that we've made to date.

25 Today I'm going to be discussing the

1 background of why we undertook this initiative. The  
2 goals, our approach, the public comments that we've  
3 received, and then a final summary slide.

4 So the Division of Fuel Management  
5 recognized that there was a need to consolidate the  
6 Transportation Standard Review Plans. The SRPs were  
7 issued in 1999/2000 timeframe. And those were NUREG-  
8 1609 and NUREG-1617. And they included supplements to  
9 them for specific topics; MOX fuel, as well as TPBARs.

10 In addition, over the last two decades,  
11 we've had many interim staff guidance documents that  
12 were issued to assist in implementing any changes to  
13 Part 71 and any emergent issues that required  
14 technical clarification. We also thought this would  
15 be a good opportunity to improve the structure of the  
16 SRP. And we are using a similar approach to NUREG-  
17 0800, which is used NRR, which essentially  
18 consolidates all of the information into modular  
19 chapters. So if there's a specific technical area, we  
20 can just make that change to the SRP.

21 CHAIR BALLINGER: Can you hear him okay?

22 MALE PARTICIPANT: Yeah.

23 CHAIR BALLINGER: Okay.

24 MEMBER MARCH-LEUBA: While you're talking  
25 about that, one of the beautiful things about NUREG-

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1 0800 is that it can be updated in ADAMS on a page by  
2 page basis without having to issue a whole addendum.  
3 Are you doing the same thing?

4 MR. SMITH: We plan to do the same thing.  
5 And the main reason was because our interim staff  
6 guidance process when it was first initiated, there  
7 was no public comment period. It was very informal.  
8 It was just hey staff, this is something you need to  
9 be aware of and we would issue it. As time  
10 progressed, those became more and more labor intensive  
11 to issue an interim staff guidance document until it  
12 was almost equivalent to issuing a little mini SRP.  
13 So by doing this separate, we hope to minimize any  
14 future use of ISGs at all. And we're going to be  
15 sunsetting the existing ISGs.

16 MEMBER MARCH-LEUBA: Right. No, the  
17 problem is typically ADAMS requires you to issue a  
18 completed new revision of the document every time you  
19 modify one column. And then they figure out a way, so  
20 you can make these updates without having to issue the  
21 whole thing.

22 MR. SMITH: That is our attempt.

23 MEMBER MARCH-LEUBA: Talk to them and make  
24 sure you do.

25 MR. SMITH: I definitely will. So our

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1 goals in undertaking this effort, as always, we want  
2 to maintain the safe and secure transportation of  
3 radioactive materials. We think there will be an  
4 increase in the efficiency reviews, primarily because  
5 all of the information that is scattered throughout  
6 numerous documents will now be consolidated into one  
7 overall document. This effort is going to minimize or  
8 eliminate the use of ISGs. Our intent is to eliminate  
9 them. It will improve the efficiency of future  
10 revisions as you stated that we should be able to do  
11 this on a modular basis. And the ultimate goal is  
12 have one SRP for all transportation package review  
13 guidance.

14 The approach that we took on this, we  
15 formed an internal NRC team consisting of staff from  
16 all the technical disciplines that would be involved  
17 in a review. And we consolidated the review guidance  
18 found in NUREG-1609 and NUREG-1617. We also  
19 incorporated the MOX and TPBAR supplements. We  
20 incorporated the ISGs and any other technical  
21 guidances being used currently on the street. And we  
22 updated figures and references to regulations related  
23 to all the specific review areas.

24 So NUREG-2216 does not introduce new staff  
25 positions on technical issues. This is the way we are

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1 currently doing reviews. It was a concerted effort to  
2 make sure we did not include things that have not been  
3 reviewed yet. It incorporated our staff review  
4 experience and practice in order to establish a  
5 consistency of review across all of our reviewers.  
6 The technical chapters were updated to consolidate all  
7 of the current transportation guidance. And as part  
8 of this effort, we created two new chapters; a  
9 materials and a quality assurance. These two chapters  
10 did not exist in NUREG-1609 or 1617, but were rather  
11 incorporated by reference in various ISGs.

12 For public comments, we received four  
13 public comment letters in response to our Federal  
14 Register Notice; NEI, ORANO, HOLTEC, and one anonymous  
15 comment.

16 MALE PARTICIPANT: So ORANO is TN?

17 MR. SMITH: Yeah, it's TN. TN is now  
18 ORANO. And one comment that we got from several  
19 sources was that NUREG-2216 and Regulatory Guide 7.9,  
20 which is our standard format content guide for Part 71  
21 applications, by issuing this SRP would become  
22 consistent. And we are aware that they would be  
23 inconsistent. That was a management decision that we  
24 will draft the SRP first. And then subsequently  
25 revise Reg Guide 7.9 in order to make them, you know,

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1 harmonize together.

2 We reviewed, you know, several formatting  
3 of the SRP or editorial type comments on it. Some of  
4 the public comments requested additional guidance, you  
5 know? However at this point in time, this is only a  
6 consolidation effort. Any need for new guidance would  
7 be looked at for a future revision to this SRP. Many  
8 of the comments were out of scope for this  
9 consolidation effort, primarily because it is only a  
10 consolidation and does not expand upon the way we do  
11 our technical reviews. And there were other changes of  
12 clarifications that were requested.

13 MEMBER MARCH-LEUBA: This request for new  
14 guidance, obviously a member of the public thought it  
15 was important and it was lacking. So have you guys  
16 any idea what that's about?

17 MR. SMITH: The additional guidance that  
18 was requested?

19 MEMBER MARCH-LEUBA: Yes.

20 MR. SMITH: A lot of them have to do with  
21 risk informing our regulations since that it is a big  
22 effort at this point in time.

23 MEMBER MARCH-LEUBA: Okay, so that's a big  
24 effort?

25 MR. SMITH: That's a big effort. And

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1 there had been discussions back when we first started  
2 this effort about you know, do we want -- you know,  
3 because these were two efforts that were going kind of  
4 parallel to each other. And the decision was made not  
5 to tie up the SRP consolidation effort with, you know,  
6 risk informing them at this point in time. So that we  
7 could at least get the SRP out on the street.

8 MEMBER MARCH-LEUBA: So in your opinion,  
9 there is no low hanging fruit where you can satisfy  
10 these members -- if it's risk informed, it's not low  
11 hanging fruit.

12 MR. SMITH: Right, right. It is not low  
13 hanging fruit. Were there any other specific ones?  
14 Do you remember, for additional guidance for the  
15 technical areas?

16 MR. WHITE: Yes. Bernie White, Division  
17 of Spent Fuel Management. We got some comments about  
18 clarify what you mean by appropriate, inappropriate,  
19 clarify, you know, comments like those as well.

20 MEMBER MARCH-LEUBA: Is there an actual  
21 schedule, however theoretical it might be for  
22 completing the risk informing process?

23 MR. SMITH: I really can't speak to that  
24 since that's a separate effort. I'm hoping somebody  
25 can --

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1 MR. REGAN: I'd like to capture more as a  
2 living process, we're in a continuum. Every  
3 opportunity we see where we can risk inform our  
4 program, we're going to look at it and take a crack at  
5 it. Case and point, you know, our Oversight Program  
6 reviews risk insights to inform proposed options and  
7 recommendations for Oversight Program for spent fuel  
8 storage installations. And will continue as I  
9 mentioned, a graded approach in the storage area on  
10 how we can use the risk insights to inform how we  
11 develop guidance for storage reviews. So it's not a  
12 holistic, we're going to do one evaluation of the  
13 whole program and incorporate risk insights and then  
14 be done. It's more of a continuum as we work through  
15 a whole host of issues that we have on the books to  
16 incorporate them where we can.

17 MALE PARTICIPANT: Did we miss the person  
18 on the line?

19 MR. SMITH: Oh no, we're coming up there.  
20 So this is -- if we can tap into the line now, Chris.  
21 We're going to start off with Chapter 2, which is our  
22 structural chapter. And the way we have the rest of  
23 the presentation laid out is we were going to cover  
24 some of the chapters that we received comments on or  
25 that had changes -- incorporation of ISGs. And we

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1 will let each technical discipline discuss those.

2 All right. Tony, are you there?

3 MR. RIGATO: Yes, I'm here.

4 MR. SMITH: Wow.

5 MEMBER MARCH-LEUBA: Yes, we can hear you.

6 MR. SMITH: We can hear you, Tony great.

7 Thank you.

8 MR. RIGATO: Sure. And so here on the  
9 presentation, I've got -- it's on Slide 9. I don't  
10 think that changed, basically the outline is still the  
11 same from this morning. And basically we've  
12 incorporated two ISGs. There's actually a third one  
13 that's not listed here. I only realized afterwards  
14 that he just didn't put it on the Table 1 of the SRP  
15 to indicate that was included. And that is ISG-12,  
16 which is the bundling of fuel.

17 But ISG-1 as it states here, it talks  
18 about the description of damaged fuel. It's something  
19 we work in tandem with the material scope and  
20 criticality. Computational modeling, that's another  
21 one that you'll also see. The thermal inspection  
22 (phonetic) is basically providing a little more  
23 guidance for a lot of these models that we receive.  
24 Because a lot of the work that we do receives in terms  
25 of amendment requests and so on are based on, you

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1 know, analytical modeling itself, rather than physical  
2 drop testing.

3 A lot of the comments were not very  
4 specific. Some were very simple corrections, maybe  
5 pointing, you know, to the right chapter. As Bernie  
6 had alluded to previously some of the comments were  
7 clarify or you know, could you expand upon. There was  
8 also a request of a little bit of new information  
9 beyond the scope of consolidation. One of the  
10 examples was how to include statistical deviation in  
11 structural characteristics and accident evaluation  
12 ranges. But for the most part, there wasn't too much  
13 to actually modify what we've already had in the SRP  
14 in terms of you know, other comments in terms of  
15 corrections or clarifications. And that's pretty much  
16 it for this.

17 The next slide is thermal, so I'll let  
18 those folks or experts take a crack at that. Thank  
19 you.

20 MR. SOLIS: On the thermal part -- Well  
21 again, according to what Jeremy mentioned, the content  
22 was reorganized to align with current practices in  
23 terms of the review areas for the contents. Also  
24 added ISG-7, which is potential generic issue  
25 concerning cask heat transfer in a transportation

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1 accident. Basically that through the effect of the  
2 fission products and gases released when the spent  
3 fuel rods break -- in the case they break. And the  
4 effect on the thermal conductivity.

5 Also, as Tony said, we added ISG-21, which  
6 is the use of computational modeling software. And  
7 the regulatory language was clarified. And when it  
8 comes to the comments really, very minor areas were  
9 necessary to address them. So really nothing big.  
10 Just the specific typos, clarifications. Added a  
11 regulation where it's needed, et cetera.

12 MR. BOROWSKY: For containment, there were  
13 no significant changes to the chapter. Table 4-1 was  
14 added. And that basically showed relevant regulations  
15 for each of the review areas. The chapter refers to  
16 NRC information Notice 2016-04, which was published  
17 many years after the previous SRP issuance states,  
18 roughly the year 2000. There were some editorial  
19 changes basically setting structure for example. And  
20 there were discussions and terminology was clarified.  
21 For example, replacing the word SAR with application.  
22 Other than that, there were very little significant  
23 changes.

24 MR. SMITH: Well, Chapter 5 is a shielding  
25 chapter. I was not the technical reviewer for that,

1 but he is currently on a fellowship to Japan for a  
2 year. So he was unable to make this meeting with us.  
3 Chapter 5 again, clarifies certain review topics  
4 throughout the SRP, especially Chapter 5. We added  
5 ISG-6, which is establishing the minimum initial  
6 enrichment for the bounding design basis fuel  
7 assemblies. ISG-21, which is kind of a common intro,  
8 just that covers the use of computational model  
9 software.

10 There were minor edits for clarifications  
11 based on the public comments. And there were some new  
12 methodologies proposed by the public, but they at this  
13 point in time, are beyond the scope of this  
14 consolidation effort.

15 MEMBER MARCH-LEUBA: Let's talk something  
16 technical, what do you mean by minimum initial  
17 enrichment? And I'm thinking of the effort -- we  
18 keep asking the same question, are we going to go  
19 above 5 percent? Is this addressed there or will it  
20 have to be revised?

21 MR. SMITH: At this point in time, I think  
22 we're still investigating the above 5 percent issue.  
23 It was not incorporated into this SRP.

24 MEMBER MARCH-LEUBA: Isn't the staff now  
25 actually finding a way to allow up to 10 percent?

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1 MR. SMITH: I know the staff is  
2 investigating --

3 MEMBER MARCH-LEUBA: Yeah.

4 MR. SMITH: -- increased enrichments based  
5 on the accident tolerant fuels.

6 MEMBER MARCH-LEUBA: Yeah.

7 MR. SMITH: And this is kind of an ongoing  
8 -- I think there's a research effort on that right now  
9 --

10 MEMBER MARCH-LEUBA: Right.

11 MR. SMITH: -- to determine how we can do  
12 that.

13 MEMBER MARCH-LEUBA: Right. This being  
14 life, you have to assume that if you can load a bundle  
15 with 6 percent enrichment, it will develop a problem  
16 and you'll have to transport it out to the plant.  
17 Right? So whatever the maximum enrichment is, that's  
18 where you have to assume at least one of the bundles  
19 in the cask has.

20 MR. SMITH: Right.

21 MEMBER MARCH-LEUBA: So but to my original  
22 question. What do you mean by minimal initial  
23 enrichment in ISG-6?

24 MR. SMITH: Can I turn this over to a  
25 shielding colleague of mine?

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1 MEMBER MARCH-LEUBA: Oh Veronica.

2 MS. WILSON: Is this on?

3 MEMBER MARCH-LEUBA: No, that one has not  
4 worked this morning. You have to walk up there. And  
5 you have to talk real close to it.

6 MS. WILSON: Really close? Okay, this is  
7 Veronica Wilson, NRC, Division of -- what are we, Fuel  
8 Management now?

9 (Off-microphone comments.)

10 MS. WILSON: Okay. Jose and I actually go  
11 way back, so this is really fun. So in this context,  
12 this is for shielding. And it's for establishing  
13 source terms of spent fuel in which case to try to do  
14 a bounding source term, they have to establish a  
15 minimum enrichment rather than a maximum like in  
16 criticality for instance. So to maximize -- because  
17 like we want to store like a bunch of spent fuel.  
18 It's like well how do you bound that? So from a  
19 shielding perspective, generally maximum burn-up,  
20 because more burn-up is more source term.

21 MEMBER MARCH-LEUBA: Wait, wait, wait.

22 MS. WILSON: Okay. And then minimum  
23 cooling time because -- Yeah, minimum cooling time  
24 because more cold is less source term. And then  
25 minimum enrichment because the higher enrichments

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1 actually give you less source term.

2 MEMBER MARCH-LEUBA: Oh, higher  
3 enrichment, you get less source term?

4 MS. WILSON: Well it's -- So if you think  
5 about if you burn a fuel assembly at the same power --  
6 So if you get a fuel assembly that reaches the same  
7 burn-up --

8 MEMBER MARCH-LEUBA: I get it. There is  
9 less --

10 (simultaneous speaking)

11 MS. WILSON: -- then now you're getting  
12 more neutron source. You're getting more --

13 MEMBER MARCH-LEUBA: I get it. You're  
14 burning the same amount of 235, but there is less 238  
15 for use --

16 MS. WILSON: Yeah. So it gives you a  
17 higher source term and you have a lower enrichment.

18 MEMBER MARCH-LEUBA: Okay.

19 MS. WILSON: So this is just clarifying  
20 that.

21 MEMBER MARCH-LEUBA: I should have known.  
22 Thank you.

23 MS. WILSON: Yes, of course.

24 MEMBER REMPE: My understanding is that at  
25 some point you do have different isotope mixtures if

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1 you do go to a higher enrichment. Right?

2 MS. WILSON: Yes. But in general, just to  
3 speak of more like what is the bounding source term?  
4 The lower enrichment will give you the lower bounding  
5 source term even if it has like a different mix of  
6 nuclides.

7 MEMBER REMPE: Okay. So there's nothing  
8 in this NUREG-- or this SRP that will need to be  
9 changed if they go to 8 percent?

10 MS. WILSON: I am not going to speak to  
11 that because I imagine that's future stuff that we  
12 haven't really delved into. But in relation to just  
13 this slide and shielding --

14 MEMBER REMPE: Okay.

15 MS. WILSON: -- for shielding stuff,  
16 higher enrichment is generally better.

17 MEMBER REMPE: Okay, that helps.

18 MS. WILSON: Because you're not, you know,  
19 not producing as much actinides and activations, and  
20 you know --

21 MEMBER REMPE: Okay.

22 MR. SMITH: Okay. So on the criticality  
23 chapter, we brought the SRP up to the current Part 71  
24 regulations. Example of this is this is the transport  
25 index was replaced with both the criticality safety

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1 index and the transport index. We added the ISG-8  
2 Revision 3, which is burn-up credit and the  
3 criticality safety analysis for spent fuel, transport  
4 and storage casks. This was a -- as you can see, this  
5 ISG has already undergone three revisions. And it's  
6 important because when these SRPs were originally  
7 fashioned, they assumed a fresh fuel load-out. And as  
8 the industry has progressed, they've requested burn-up  
9 credit because you can fit more of the fuel assemblies  
10 in any given cask.

11 We also incorporated ISG-19, which is  
12 moderator exclusion under Hypothetical Acts Conditions  
13 to meet the requirements of 10 CFR 7155(e). And we  
14 added ISG-21, the use of computational modeling  
15 software.

16 MR. DUNN: Okay for materials, we added a  
17 chapter to provide review guidance. The materials  
18 information was in various chapters -- various  
19 technical review chapters in NUREG 1609 and 1617. So  
20 there was no specific materials chapter in those SRPs.  
21 And we also had a number of interim staff guidance  
22 documents, which I have listed on the following slide,  
23 that we incorporated to produce this materials  
24 chapter.

25 We did receive a good number of very good

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1 public comments. I think about five or six comments.  
2 We took a look at those comments and in general, agree  
3 with the substance of those comments. And have made  
4 some proposed revisions to the SRP to address those.  
5 I won't go into every one of the comments, but I would  
6 like to address at least a couple of them that I think  
7 are significant with respect to the SRP.

8 We received a comment about coating  
9 qualification. We had a statement in there about, you  
10 know, coatings should be evaluated by a qualified  
11 coatings engineer. And the comment was that this is  
12 not consistent with the review guidance that existed,  
13 primarily in Chapter 2 of the NUREG 1609 and 1617.  
14 And we looked at that comment and we agree with the  
15 substance of that comment. And we have proposed to  
16 remove that from the SRP.

17 We had another comment later on in the SRP  
18 about the purity of cover gas and sampling of that.  
19 And again, that was actually provided as an example of  
20 a way to confirm that an inert environment had been  
21 maintained for the transportation of spent fuel after  
22 loading. And the comment that we got was that, that's  
23 inconsistent with the current practices. And even  
24 though we provided that information as an example,  
25 when we went back and looked at that, we thought that

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1 well this was -- this was actually guidance that was  
2 really a report that was developed primarily for  
3 storage looking at the effect of contaminants over 40  
4 years of time. So it wasn't really applicable to our  
5 good example for a transportation system.

6 And we were also reminded of some of the  
7 comments that we have received from Industry in public  
8 meetings and other public comments where we provide an  
9 example, but that example can kind of become the de  
10 facto standard. And that was not our intent of  
11 providing this as an example. So again, we're  
12 recommending deleting that particular example from the  
13 SRP.

14 And the final comment that I'd like to  
15 speak to is one that involves the guidance that was  
16 originally in ISG-11, Rev 3 on the thermal cycling  
17 during drying for spent fuel. And originally what we  
18 had in our transportation SRP that went out for public  
19 comment was that thermal cycling criteria was  
20 specifically for high burn-up fuel. And the comment  
21 that we received was that's not what ISG-11, Rev 3  
22 says. What it says is that criteria's applicable to  
23 all commercial spent fuel types and burn-ups. And we  
24 agree with the comment. That is what ISG-11, Rev 3  
25 says. So we have proposed changes to the SRP to be

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1 consistent with the information that is included in  
2 ISG-11, Rev 3.

3 If there are other comments that come up  
4 later on about some of the other comments we've  
5 addressed, we can certainly talk about those. But  
6 those were the three that I had intended to talk about  
7 here. So next slide.

8 So this slide has the interim staff  
9 guidance documents that were incorporated into the  
10 materials evaluation chapter. The one in the center  
11 there, ISG-15 is essentially the bulk of the materials  
12 evaluation chapter. We also included ISG-1, Revision  
13 2 in the chapter, as well as ISG-11, Rev 3, which I've  
14 talked to. And ISG-22 on potential rod splitting due  
15 to exposure to an oxidizing environment. And ISG-23  
16 is included in Attachment 7(a) to the materials  
17 chapter. That's all I have.

18 MR. SMITH: So the other chapter that we  
19 added was a quality assurance chapter. We added this  
20 chapter in order to provide a review guidance for  
21 package applications that have the quality assurance  
22 plan. And the content is very similar to what had  
23 applied in NUREG 2215. It provides additional  
24 guidance for applications that reference a previously  
25 approved quality assurance plan. And we did receive

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1 one comment that questioned the need for a QA chapter  
2 in the SRP. There is no need -- I believe -- Bernie,  
3 can I give this one to you? I know you know more  
4 about this than I do.

5 MR. WHITE: This is Bernie White,  
6 Division of Spent Fuel Management. One of the  
7 requirements in an application is a description -- in  
8 the application for transportation packages, is a  
9 description of the quality assurance program. So some  
10 entities like Department of Energy don't have an NRC  
11 approved QA plan. And so they provide us a  
12 description of their quality assurance program and we  
13 review that. Companies that we know have -- that we  
14 do business with routinely that we know have a quality  
15 assurance program, they just don't provide us anything  
16 or just say we have one. It's Quality Assurance  
17 Program No. XYZ.

18 MR. SMITH: So in summary, NUREG 2216 is  
19 a consolidation of our existing staff guidance. The  
20 new SRP does not introduce new positions by staff, but  
21 rather just pulls it all together and clarifies some  
22 topics that were presented in other reference  
23 documents and the comments from the public indicated  
24 areas where additional clarification may be needed.

25 CHAIR BALLINGER: That's it for you guys?

1                   MEMBER REMPE: Well since we're way ahead  
2 of schedule, go to Slide 25 and let's look at the  
3 picture --

4                   CHAIR BALLINGER: Let's do something that  
5 will get us behind schedule.

6                   MEMBER REMPE: Well let's just talk about  
7 the pictures. I was curious about them. What's the  
8 upper left picture of?

9                   MR. WHITE: It's Bernie White again,  
10 Division of Spent Fuel Management. The upper left is  
11 a pin puncture on -- I want to say it's one of the  
12 TRUPACT packages that regulates for hypothetical  
13 accident condition required of 9 meter drop test, a 1  
14 meter pin puncture test, and then a 30 minute fire.  
15 The upper left is a pin puncture. The picture on the  
16 right is a 30 foot drop test, 9 meters. And then the  
17 bottom left is a furnace fire test and a furnace on a  
18 package.

19                   MEMBER REMPE: Thank you.

20                   MR. WHITE: You're welcome.

21                   MEMBER REMPE: It was the most exciting  
22 slide.

23                   CHAIR BALLINGER: For the end reactor  
24 fuel, I actually witnessed the drop test.

25                   MEMBER REMPE: Okay.

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1 MEMBER MARCH-LEUBA: On the picture on the  
2 right, that's a full size cask? I mean it looks very  
3 small.

4 MR. WHITE: Yeah, my guess is that would  
5 be a half or quarter scale test. It's hard to judge  
6 from here. But most of -- So most of the bigger  
7 packages like spent fuel packages of that size, they  
8 do quarter half scale tests. Some of the smaller  
9 packages, the drum size packages, they'll do full  
10 scale tests.

11 MEMBER MARCH-LEUBA: So they do computer  
12 modeling or some kind of a scaling fuel?

13 MR. WHITE: Spent fuel packages, they  
14 will use that to -- I use the term "benchmark" their  
15 computer modeling.

16 (Simultaneous speaking.)

17 MR. WHITE: Right. Some of the smaller  
18 packages solely rely on drop tests. And they'll drop  
19 the package in four, five, six different orientations  
20 from 30 feet and several pin punctures as well.

21 CHAIR BALLINGER: There are a bunch of  
22 other pretty exciting ones like that F4 Phantom flying  
23 into the side of one of these things. And if you put  
24 a picture of the Navy cask up there.

25 MR. WHITE: We have one, it's large.

1 CHAIR BALLINGER: Thank you. So we need  
2 to swap out and have any I folk who is here.

3 MR. RICHTER: I do have a brief question.

4 MEMBER MARCH-LEUBA: You need to put your  
5 green light on.

6 (Off-microphone comments.)

7 MEMBER MARCH-LEUBA: No, he's not  
8 scheduled to talk.

9 MEMBER REMPE: But he's got a question.  
10 So pretend like you're at the mic and say your name.

11 (Simultaneous speaking.)

12 MR. RICHTER: This is Mark Richter, NEI.  
13 I have just one question for the staff. I noticed on  
14 some of the slides that you used the term "adding an  
15 ISG." In other places, you indicated "incorporating  
16 an ISG." You may have noted the difference or the  
17 distinction between the two and I may have missed  
18 that. But is there any difference in the processing  
19 in adding versus incorporating?

20 MR. SMITH: I don't believe that the staff  
21 intended a difference. The way we created the slide  
22 -- each technical person created their own slide. And  
23 so they used the word "incorporated" or "added."

24 MR. RICHTER: That's what I suspected. I  
25 just wanted to be sure I wasn't missing some subtlety.

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1 Thanks.

2 (Off-microphone comments.)

3 MR. RICHTER: Okay, well, good afternoon,  
4 everyone. For those of you who may not know me, I'm  
5 Mark Richter. I'm a Senior Project Manager with NEI,  
6 Nuclear Energy Institute. I work in the Used Fuel and  
7 Deconditioning Program section. I'd like to first  
8 thanks NRC and the ACRS Subcommittee for providing me  
9 with an opportunity today to provide an NEI and an  
10 Industry perspective regarding NUREG-2216. What I'm  
11 presenting today is really a collective opinion -- an  
12 assemblage of a variety of Industry inputs from  
13 licensees, suppliers, and so forth. And we believe  
14 it's really important that we have the opportunity to  
15 be here today to share those with you to inform -- you  
16 know, what you do going forward with NUREG-2216.

17 From our perspective, we think it's  
18 especially important given the fact that, you know,  
19 we're moving closer to the possibility of actually  
20 transporting spent fuel to consolidate at interim  
21 storage facilities, potentially as early as the end of  
22 2023 or sometime in 2024. Which on the one hand, a  
23 few years away is a few years away. But in our world,  
24 a few years will pass pretty quickly. So from our  
25 point of view, it's very timely and important that

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1 we're here today to talk about this.

2 And also we wanted to express our  
3 appreciation for the staff's efforts to improve the  
4 efficiency of the processes involved in reviewing the  
5 transportation-related documents. And the benefits  
6 hopefully that we'll achieve as an Industry from  
7 consolidating the Standard Review Plan into one single  
8 document. Much of which you've already heard  
9 addressed by Jeremy and others earlier.

10 Okay, and I mentioned that this is  
11 important to the Industry and I know the staff in  
12 their presentation just a few minutes ago, you know,  
13 focused on a lot of, you know, desired benefits and  
14 anticipated benefits of the consolidation and  
15 incorporation of a lot of the requirements into a  
16 single document. But would like to reiterate from our  
17 standpoint, the importance of that as well. You know,  
18 we see this as an opportunity to consolidate much of  
19 the guidance and improved regulatory efficiency in a  
20 way that at least we hope, and I'm sure it's NRCs  
21 intent as well, in a way that's consistent with NRCs  
22 broader vision of transformational, you know,  
23 transforming the way the NRC does business and you  
24 know, transforming regulatory framework to make it  
25 more efficient.

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1           And you know, from our perspective, you  
2 know, a uniformed review basis that is clear and is  
3 not subject or pruned to subjectivity and  
4 interpretation of different reviewers is really  
5 essential if we're going to achieve our shared goal of  
6 improved regulatory efficiency. And I'd also like to  
7 note too that, you know, coming into the meeting  
8 today, I was really pleased to hear that a lot of the  
9 work has already begun on addressing some of the  
10 public comments, especially those related to  
11 clarification and reduction of some of the  
12 ambiguities. So I take that as a very positive sign  
13 that some of those actions are already underway.

14           CHAIR BALLINGER: Do I read Bullet 2 to  
15 mean that there in past times has been subjectivity to  
16 interpretation?

17           MR. RICHTER: That may be subject to  
18 interpretation. Well I think you know, without  
19 pointing to any -- all kidding aside, without pointing  
20 to any past history, you know we're just stating in an  
21 affirmative way the importance of clear and  
22 unambiguous communication is, you know, it's first and  
23 foremost in being able to be effective and efficient  
24 without any -- you know, it's not meant to be a  
25 comment on previous documents or interpretation

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1       thereof. We are just looking forward with this. And  
2       want to make sure it's as clear and as tight as  
3       possible.

4               Okay and the way that we undertook the  
5       review is a little bit different than what the staff  
6       provided in their presentation. They basically went  
7       chapter by chapter and provided a summary of some of  
8       the comments and some of the early actions or  
9       anticipated actions. Our approach, as you know, the  
10      document is pretty lengthy. It's, I guess, close to  
11      500 pages if you count each page front to back.

12             And you know when Industry reviews a  
13      document like this, we tend to do it as a team and NEI  
14      collects a lot of different inputs from a lot of  
15      different sources. So from our perspective, we tried  
16      to provide comments, you know, by category or type,  
17      rather than by chapter or by section. And as you can  
18      see on the slide here, we've captured those in four  
19      general areas.

20             One being integration of ISGs and other  
21      documents. From our standpoint, you know, clearly  
22      identifying the areas of the NUREG to tie to each of  
23      those references is important again for improving  
24      efficiency and review. We identified a number of  
25      areas where there were some undefined or nonspecific

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1 terms. And also some general comments that may be you  
2 know, somewhat open to interpretation. So our  
3 recommendation there was to kind of tighten that up  
4 and get a look at some of those areas. You know,  
5 consider maybe some different words or word choices to  
6 improve the clarity.

7 Technical considerations, we found a  
8 number of different areas where there may have been --  
9 you know, we raised some flags or some of our  
10 reviewers raised some flags relative to what was being  
11 expected or required. And whether or not that was  
12 above and beyond what might be needed to demonstrate,  
13 you know, the reasonable assurance of public health  
14 and safety.

15 And then also too, we were looking for  
16 anything that resembled new requirements. And if we  
17 saw anything that looked like a new requirement, at  
18 least from our perspective, to flag that and suggest  
19 that a basis -- a technical basis for justification be  
20 provided along with that.

21 MEMBER MARCH-LEUBA: And Mark, what is the  
22 status of your recommendations? Are you satisfied  
23 with the way the staff handled your recommendations?  
24 Or just thank you very much and come back in?

25 MR. RICHTER: Right. Well you know, as

1 indicated by really all of the staff that presented  
2 today, that we're just in the beginning of a process.  
3 I'm encouraged by the fact that, you know, coming in  
4 here today, I'm already hearing that, you know, some  
5 of the -- I guess some of the low hanging fruit has  
6 already been picked up. I think there's more  
7 substantial things that probably will take more work,  
8 maybe greater collaboration with Industry to develop  
9 an understanding of what some of our perspectives are.  
10 But I think in terms of your question, the status,  
11 it's early in the process. But I think some of the  
12 work, you know, it's evident it's already underway.

13 MEMBER MARCH-LEUBA: So you see a path  
14 forward for --

15 MR. RICHTER: I see movement in the right  
16 direction. The path I think will be better defined as  
17 we go further along and maybe dig into some of the  
18 more --

19 MEMBER MARCH-LEUBA: I see some of those  
20 like reasonable assurance is in the eye of the  
21 beholder.

22 MR. RICHTER: Sure. Yeah.

23 MEMBER MARCH-LEUBA: Those are not low  
24 hanging fruit like --

25 MR. RICHTER: Yeah, some of those will be

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1 more difficult to resolve. Others, you know, maybe  
2 address more simply.

3 MEMBER MARCH-LEUBA: But you're at least  
4 not completely unhappy.

5 MR. RICHTER: No, not at all as of today.  
6 I see, you know --

7 MEMBER MARCH-LEUBA: Thank you.

8 MR. RICHTER: -- that those comments have  
9 been taken to heart and they're working on addressing  
10 them, so that's all good.

11 CHAIR BALLINGER: In looking at -- We may  
12 be getting ahead of ourselves a little bit, at least  
13 I may, but in looking at your slides, I've read -- you  
14 know, I see what you're getting at. But I didn't see  
15 a slide that said here are the key points of  
16 difference that need to be resolved. In other words,  
17 the real -- if there are any real substantive issues  
18 where there's a difference that we really need to talk  
19 to each other more carefully about.

20 MR. RICHTER: Yeah. What I plan to do at  
21 the end when I close our portion of the presentation  
22 is really speak a little bit to the white paper that  
23 we've heard mentioned here a couple times. Not so  
24 much to contrast that or present it in a way that it  
25 shows differences. But more in a way where it shows

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1 opportunity to improve the regulatory framework and  
2 increase efficiency in the review. Better use of  
3 resources across the whole Agency, not just in this  
4 particular area.

5 SO you know, if you look at the comments  
6 we have preceding that, I don't know that I can sit  
7 here and say one is potentially more important or more  
8 impactful than another because even a simple  
9 interpretation of a word or a phrase, while on the  
10 surface, looks insignificant, could lead to a pretty  
11 impactful conclusion. So to your point, I don't have  
12 a listing that sort of ranks by priority; most  
13 important, somewhat important, and --

14 CHAIR BALLINGER: But you're operating  
15 under the previous NUREGs anyway.

16 MR. RICHTER: Yes. Yes. Okay, let's see.  
17 Where am I? The slides caught up with my paper. As  
18 I mentioned earlier, you know, in each of the four  
19 areas or categories of comment, we tried to provide  
20 some examples. Certainly not meant to be an  
21 exhaustive or an exclusive list, but merely examples  
22 of the types of things that were identified. And has  
23 been mentioned, you know, in the previous  
24 presentation, some of those have been addressed or are  
25 in the process of being addressed. But if you look at

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1 NUREG 2216, it in many ways is an integration of other  
2 documents into a single document.

3 And again, this integration presents an  
4 opportunity to improve review efficiency. But there's  
5 some things that couldn't be done structurally with  
6 the document and how it's organized to facilitate the  
7 review and some of those are listed here. One is a  
8 list of the supporting Reg guides and NUREGs. That's  
9 been provided in Section 2, but it seemed to be absent  
10 in the other sections. And I know this was created in  
11 a modular fashion. But you know, I think there's an  
12 opportunity there to replicate the good practices from  
13 one chapter to the next in terms of, you know, how the  
14 supporting information is detailed. We think that not  
15 only will help the reviewers, but it will also help  
16 licensees in preparation of any documents that they  
17 submit. It will be a handy reference to put some of  
18 those things together.

19 MEMBER REMPE: On the first bullet, you  
20 kind of skipped over it.

21 MR. RICHTER: Oh, I'm sorry.

22 MEMBER REMPE: I was going to ask why on  
23 earth -- what difference does it make? You have a Reg  
24 Guide 7.9. They reference it throughout the SRP. Why  
25 does it -- you know, they said they're going to be

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1 updating it. Why is it so important to have it as an  
2 appendix in this document? And if they do what Jose  
3 is suggesting, they could update it in a modular  
4 fashion. But it's guidance.

5 MR. RICHTER: Right.

6 MEMBER REMPE: It's not part of the SRP.  
7 Why was that so important?

8 MR. RICHTER: Well again, it's identified  
9 as an example of the type of thing that could be  
10 addressed in organization. You know, certainly we  
11 don't lay this out as a mandate for the staff that you  
12 must do this. You know, this represents some of the  
13 comments that we received. Some of our members felt  
14 was important --

15 MEMBER REMPE: But why was it important is  
16 what I'm asking? I don't see why it's important to  
17 have it as part of this.

18 MR. RICHTER: You know, I think -- and I'm  
19 now speaking on behalf of others clearly, but I think  
20 it's really for sake of continuity and completeness.  
21 Others that may be new to the business will read this.  
22 It may help their understanding of how you got to  
23 Point B from Point A historically. It's a matter of  
24 reference.

25 MEMBER REMPE: Well it is sited in the

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1 document.

2 MR. RICHTER: Is it in a technically  
3 important sense? Probably not to your point. But  
4 from sort of a comprehensive approach, some people  
5 thought it would be important to have that. Are we  
6 good? Next slide.

7 Okay, there were a number of examples  
8 throughout the NUREG where there were some undefined  
9 or nonspecific terms. For example, words like  
10 accurately or correctly appear. You know, from our  
11 perspective, they have the potential to be subjective  
12 and to lend themselves to different interpretation by  
13 different people. You know, what does accurately  
14 mean? What does correctly mean? So that's something  
15 that we wanted to bring attention to.

16 Then also too, in particular a number of  
17 our members flagged the interpretation of the word  
18 "reasonable" at least in the context of cladding  
19 degradation and high burn-up fuel. So you know, we  
20 see there's an opportunity for NRC and the National  
21 Labs maybe to work collaboratively to help put better  
22 definition on that. That's kind of a suggestion  
23 maybe, more for future work than for the editing and  
24 revising of the draft. But I wanted to put that out  
25 there also as another example of an opportunity to

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1 improve clarity.

2 CHAIR BALLINGER: Well you used the word  
3 "vastly". What does vastly mean? You know, like a --  
4 When you say "vastly", different interpretations. To  
5 me that means a very, very large difference between  
6 one person's opinion and another. I thought there was  
7 an actual number of the fraction of fuel that could be  
8 breached or something like that. There was actually  
9 some number of inches or something like that. That  
10 there was actually a number. Is Darrel here?

11 MR. RICHTER: Oh, in terms of the --

12 CHAIR BALLINGER: Am I reading something  
13 very different?

14 MR. RICHTER: Is that the 1 square  
15 millimeter that you're referring to?

16 CHAIR BALLINGER: There were some numbers  
17 associated with that. So I don't know how that can be  
18 interpreted as different.

19 MR. DUNN: So there is guidance. It's in  
20 ISG-1 --

21 CHAIR BALLINGER: Yeah.

22 MR. DUNN: -- Revision 2.

23 CHAIR BALLINGER: Yeah.

24 MR. DUNN: It talks about what is and what  
25 is not damaged cladding.

1 CHAIR BALLINGER: Yeah.

2 MR. DUNN: And so cladding that has a pin  
3 hole or a hairline crack can be considered intact. If  
4 it's greater than a pin hole or a hairline crack, it's  
5 considered damaged. And that's the definition that's  
6 in ISG-1, Revision 2.

7 CHAIR BALLINGER: Okay.

8 MR. DUNN: And I think that would be the  
9 basis for --

10 CHAIR BALLINGER: So really after you got  
11 the damaged, right, cladding degradation -- Okay, I  
12 thought there was ten inches or something like that.  
13 I thought I read a number somewhere. Maybe I'm just  
14 -- if you don't know --

15 MR. DUNN: I think that -- I'm pretty sure  
16 that -- isn't that for -- I think it's not for the  
17 definition. I think that's for a different analysis.

18 CHAIR BALLINGER: Okay, all right. I'm  
19 just mistaken then.

20 MEMBER MARCH-LEUBA: Just for the record,  
21 you need to tell the court reporter your name.

22 MR. DUNN: Okay, this is Darrell Dun from  
23 NRC.

24 CHAIR BALLINGER: I mean I look at -- you  
25 know, I look at that bullet and I say now there's a

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1 difference. But if the cask is leak tight, does it  
2 matter? Does it change the source term? Does it  
3 change anything?

4 MR. RICHTER: Well, you know -- and I  
5 think some of the questions that you pose sort of get  
6 at the heart of some of the questions, we've from the  
7 Industry, think about as well. You know, at what  
8 level do these things matter? Or at what point do  
9 they matter rather? And at what point do they not?  
10 So these are the kinds of things that we're hoping to  
11 address going forward. And also again with the white  
12 paper which has probably been mentioned now 37 times  
13 today. And we'll hear a few more times before we're  
14 done, I think.

15 Okay, next slide. Okay. Yeah,  
16 utilization of general comments. You know, one of the  
17 things that we've identified is statements along the  
18 lines of reviewers should verify. And that term is  
19 typically used in a context of calculations that have  
20 been made within an NRC-approved QA program. And by  
21 definition really shouldn't have any mistakes or  
22 errors.

23 And we're concerned that -- at least we  
24 have the impression at times that reviewers spend a  
25 lot of time and resources seeking what appears to be

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1 independent verification of model results that have  
2 been generated by models within an approved QA  
3 program. And that, you know, diverts resources and  
4 time away from other activities or other areas. And  
5 again, we really think that the focus needs to be on  
6 doing what needs to be done to provide reasonable  
7 assurance. And to do anything beyond that is not  
8 necessarily in keeping with principles of good  
9 regulation.

10 MEMBER REMPE: So I agree with you that  
11 the staff should focus on risk important issues. But  
12 I think it's a bit naive to say just because someone  
13 has an NRC approved QA program, there shouldn't be any  
14 errors.

15 I keep thinking about the AP when -- well,  
16 another design center which had an established, I'm  
17 sure, NRC approved QA program. But people make  
18 mistakes and somebody made a change in one part of the  
19 design and didn't tell someone in a different part of  
20 the design with the NRC approved QA program. And  
21 perhaps the Control Room didn't have enough shielding.  
22 Okay? So maybe that comment should be interpreted as  
23 they should focus on risk important issues, instead of  
24 saying just because you have an approved QA program,  
25 there shouldn't be errors. It just seems naive to --

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1 MR. RICHTER: Well, again, this is an  
2 example, not meant, you know, to exclude other  
3 examples or identified as the only one. But this is  
4 an area that we can point to that -- you know that we  
5 would say to your point, focus on what's, you know,  
6 important of being risk-informed as opposed to other  
7 things.

8 MEMBER REMPE: Right. Yeah, it's just  
9 maybe talk to whoever provided the comment that they  
10 ought to think about what they're saying.

11 MR. RICHTER: Well, I'm sure -- I  
12 understand what they're saying. And you know, I don't  
13 want to misquote them or mischaracterize their intent.  
14 But you know, from their perspective, I believe, you  
15 know, they had basis for making that -- expressing  
16 that kind of concern. So we wanted to use that as an  
17 example. Again, it's not to be treated as "the  
18 example", just an example.

19 MEMBER REMPE: Okay.

20 CHAIR BALLINGER: The second bullet, I  
21 just have a problem with there being a conflict. I  
22 mean you've got a reviewer that's reviewing an  
23 application. His or her job is to ensure that there's  
24 an expectation of reasonable assurance. Beyond that  
25 is too far. But that person's job is to check things

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1 out. So I just don't see a conflict.

2 MR. RICHTER: Well --

3 CHAIR BALLINGER: Maybe I'm just  
4 misreading something.

5 MR. RICHTER: No, I follow your question.  
6 And I appreciate where you're coming from with that.  
7 I think from the Industry perspective, it's -- you  
8 know, at what point do you continue to invest  
9 resources in evaluating differences -- maybe  
10 differences in models, differences between models, and  
11 measured results. Where in the differences are still  
12 well within the margins of a particular measurement  
13 that you're looking at.

14 CHAIR BALLINGER: Well that's not  
15 inconsistent. I mean that's different from the second  
16 bullet, is it not?

17 MR. RICHTER: In what way? I think I lost  
18 your question.

19 CHAIR BALLINGER: Well the reviewer is  
20 simply trying to verify that what the applicant says  
21 is correct. And now I agree -- I would agree  
22 personally that pushing it to an absurd level is not  
23 the right thing to do --

24 MR. RICHTER: Right.

25 CHAIR BALLINGER: -- because that's not

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1 reasonable assurance.

2 MR. RICHTER: Correct.

3 CHAIR BALLINGER: Okay.

4 MR. RICHTER: And that may be a better way  
5 to state the point that we're trying to make that,  
6 that's -- I think you're hitting it pretty closely.

7 CHAIR BALLINGER: Okay.

8 MEMBER MARCH-LEUBA: Again, this is a  
9 subcommittee meeting and this is not the ACRS  
10 position's, but members opinions. But I think you're  
11 not making yourself a favor with these examples. When  
12 I'm reading that the reviewer should not be encouraged  
13 to verify the analysis in search of errors, I cannot  
14 possibly agree with that statement. The reviewer  
15 should be encouraged categorically to review it for  
16 errors. And that's what their job is. So maybe  
17 you're using the wrong language and you mean something  
18 else. But if you keep sending those comments to the  
19 staff, you're not going to go anywhere. And you  
20 shouldn't go anywhere.

21 MR. RICHTER: No, I appreciate the  
22 comment. I think --

23 MEMBER MARCH-LEUBA: I think it means  
24 something else.

25 MR. RICHTER: Well I think Ron hit it a

1 little more closely with the way he characterized it.  
2 So I'll take that advise and we'll --

3 MEMBER MARCH-LEUBA: Okay. You're --  
4 (Simultaneous speaking.)

5 MR. RICHTER: -- address a little  
6 differently than --

7 MEMBER MARCH-LEUBA: I mean, the staff is  
8 not going to take you seriously when you say something  
9 like that. I mean I don't take you seriously.

10 MR. RICHTER: Okay. Well, I appreciate  
11 the feedback. Thanks. All right.

12 Okay, a couple of technical examples that  
13 we flagged. One, dealing with high burn-up fuel. You  
14 know, by our read collectively, you know, we thought  
15 that there's an implication that high burn-up fuel is  
16 somehow different than other spent fuel. And as such,  
17 requires special treatment. So you know, with that in  
18 mind, there's a couple of questions that we've  
19 identified that we think need to be answered if that  
20 is indeed the case.

21 You know? Is it more susceptible to  
22 breaking and shifting of low burn-up fuel? If not,  
23 then is there a distinction that's really necessary?  
24 Is the 45,000 megawatt-day per metric ton cut off  
25 required? You know, these are things that were raised

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1 in terms of if there was a distinction, what is the  
2 basis for some of the distinctions that are made?

3 MEMBER MARCH-LEUBA: Does the Industry  
4 have any basis for saying it's not?

5 MR. RICHTER: I'm sorry?

6 MEMBER MARCH-LEUBA: Do you have any basis  
7 for saying HBU -- high burn-up units of fuel -- is not  
8 more susceptible to breakage than low burn-up fuel?  
9 If you have such data, then you can provide it to the  
10 staff.

11 MR. RICHTER: Right.

12 MEMBER REMPE: Like why are you doing the  
13 high burn-up demo if you have such data? I mean --

14 MR. RICHTER: I understand the point, but  
15 I think what the Industry folks were suggesting was  
16 that -- if we're going to hang our hat on a  
17 distinction, then there should be some basis for  
18 saying that in the document.

19 MEMBER MARCH-LEUBA: Well the basis is --  
20 I have the suspicion as a regulator that hey,  
21 something that has been for 12 years inside a reactor  
22 is probably more brittle than something that is new.  
23 If I have the suspicion and I don't have any data to  
24 prove either way, I have to go with the worst  
25 assumption because I'm a regulator. I have to protect

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1 the safety of the public. So unless you have data  
2 that says it is not, I don't see a path forward.

3 MR. RICHTER: Okay.

4 MEMBER MARCH-LEUBA: But you probably are  
5 right that those fuel limits are gas -- I mean they're  
6 10 percent less strong than the other ones. And  
7 that's 10 percent is not verified. But unless we have  
8 data, we cannot do it.

9 MEMBER REMPE: Maybe after the high burn-  
10 up demo is done and if they ever get to examine the  
11 fuel out of it, they'll have a reason to revise it.

12 MR. RICHTER: Yeah. So your counterpart  
13 really is just as valid. I mean we're asking for the  
14 basis for distinction. And the challenge is, while we  
15 are in a position to provide that distinction as well  
16 for the same basis that we're asking for.

17 MEMBER MARCH-LEUBA: Yeah, but your point  
18 is valid. It points towards the research area or DOE  
19 to --

20 MR. RICHTER: Right. Yeah, questions that  
21 are unanswered basically is I guess maybe the best way  
22 to characterize that. Questions that remain to be  
23 answered.

24 CHAIR BALLINGER: I think the 45,000 is  
25 arbitrary.

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1 MEMBER MARCH-LEUBA: Absolutely.

2 CHAIR BALLINGER: I mean that is  
3 arbitrary.

4 MR. RICHTER: Right. Okay, then another  
5 example that would fall into the technical category by  
6 our categorization has to do with credit for soluble  
7 boron. You know, our readers thought that was a  
8 restriction on where credit may be taken for soluble  
9 boron in the proposed document. While the ISG that  
10 was pointed to in creation of the NUREG doesn't appear  
11 to contain any such restriction. So you know, if  
12 we've missed the point --

13 MEMBER MARCH-LEUBA: So let me ask the  
14 staff, are you guys familiar with ISG-8? Because if  
15 ISG-8, Rev 3 did not contain a restriction for soluble  
16 boron, my personal opinion is it should have. So  
17 maybe it's an error. But do you guys have an opinion?

18 MR. SMITH: For the soluble boron, you  
19 know, we've been looking at when they are loading the  
20 casket to make sure that it's not a misload accident.  
21 It just kind of a check to make sure that the proper  
22 soluble boron was present in the pool when it was  
23 loaded. We will look at clarifying that language a  
24 little bit to make sure that there's no confusion on  
25 that.

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1                   MEMBER MARCH-LEUBA:  If it's during the  
2                   loading, one can take credit for operator monitoring  
3                   and ensuring that you do have the boron salt in there.  
4                   If it's during transportation where it's been out of  
5                   your eyes, then you cannot over ten years.

6                   MR. RICHTER:  That's correct.

7                   MEMBER MARCH-LEUBA:  So there might be a  
8                   distinction in my opinion.  When you have eyes on the  
9                   borated water, you may take credit for it.  But over  
10                  long term, boron plates, it operates, god knows what  
11                  happens.

12                 MR. RICHTER:  Okay, the next slide  
13                  addresses the requirements.  And I think again not  
14                  anticipating or understanding what I was going to hear  
15                  when we put this together, I think a lot of the items  
16                  that have been laid out here are in the process of  
17                  being addressed if I'm not mistaken.  So there's  
18                  really not --

19                 CHAIR BALLINGER:  Each one of them  
20                  actually.

21                 MR. RICHTER:  So there's really not --  
22                  I'm sorry, what was that?

23                 CHAIR BALLINGER:  Each one of them  
24                  actually.

25                 MR. SMITH:  Yeah, I mean we're looking at

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1 all the comments to make sure that we provide  
2 appropriate responses.

3 MR. RICHTER: So we're very pleased that  
4 the staff has been so quick to respond to some of our  
5 comments. And I won't invest really any more time  
6 talking about these at this point. So you know,  
7 revision is underway to address those.

8 So as we move towards conclusion here,  
9 there's some recommendations that sort of are  
10 overarching here that kind of capture a lot of what  
11 we've been talking about by example. One of course  
12 being identifying reference and supporting documents.  
13 Being able to point to them clearly in the text of the  
14 NUREG if it makes sense to do that. That's really  
15 just to help a licensee, as well as the reviewer be  
16 able to get to the appropriate section or the  
17 appropriate document that supports part of the review  
18 guidance. Looking to clarify any ambiguities or lack  
19 of specificity in certain terms and statements, you  
20 know, knowing that it's not a perfect world and the  
21 language itself isn't perfect. It's almost impossible  
22 to avoid all subjectivity, but you know, do what can  
23 be done to minimize that.

24 And we would continue to encourage, you  
25 know, from an Industry standpoint, to limit review

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1 requirements to only that which is necessary to  
2 demonstrate reasonable assurance. Again, if there are  
3 new requirements or something different in the way of  
4 a technical directive that's down in the body of this  
5 document, you know, we would ask that a basis or a  
6 compelling technical argument be provided to kind of  
7 support that or give the reviewer, as well as the  
8 licensee a better understanding of the what and why of  
9 a particular activity that's required.

10 And then one of the things here that  
11 again, I want to spend a little bit of time just  
12 reviewing is the white paper we submitted back on  
13 November the 8th, defining spent fuel performance  
14 margins. We think that there's a lot of potential  
15 there to inform the NUREG. Not just now, but also  
16 going forward many opportunities there. And I just  
17 wanted to pass along a few thoughts on that before I  
18 wrap up.

19 You know, right now we've talked about  
20 conducting business under the current regulatory  
21 framework. And while it may be debatable to the  
22 degree of which it's inefficient or burdensome, I  
23 think to the point that there's incentive to create  
24 NUREG-2216, clearly there's a desire on the part of  
25 staff to be more efficient in the regulatory framework

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1 and process as that reduces the burden not only to  
2 themselves, but to Industry as well. And do it in a  
3 way that is consistent with principles -- NRCs  
4 principles of good regulation.

5 Dry storage and transportation cask  
6 licensing processes are resource intensive and time  
7 consuming, especially now in light of what we believe  
8 are pretty high levels of safety and low risk  
9 significance in the activities around what are  
10 addressed in 2216. And some of the detail that's  
11 required in the licensing documents requires licensees  
12 and the cask vendors themselves to submit a large  
13 number of license amendment request for what could be  
14 relatively simple design changes. And you know, we  
15 think in many cases, these changes have negligible if  
16 any impact on safety. And the concern from our  
17 standpoint is that both Industry and NRC resources are  
18 diverted from some more safety significant activities.  
19 And your point, Joy, that's risk informing. You know,  
20 putting your resources where they matter.

21 And you know, we can put some numbers on  
22 the degree of this problem for the Certificate of  
23 Compliance holders, as well as the staff. If you look  
24 back over the last 25 years, I believe there are 15  
25 NRC approved dry storage certificates of compliance.

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1 Those have been amended 74 times. Preparation of the  
2 amendments requires between two and nine months of  
3 effort on the certificate holders part. And  
4 potentially one to three years of review at NRC staff  
5 level.

6 In a few cases, it's actually taken longer  
7 than three years. The process itself typically  
8 involves a couple of rounds of requests for additional  
9 information. Staff can also issue requests for  
10 supplemental information and request for  
11 clarification. And for most of these, usually you're  
12 looking at one to two dozen RAIs. And many of those  
13 RAIs have many subparts. And the concern there is it  
14 gets back to reasonable assurance. To what degree do  
15 some of these things need to be assessed and broken  
16 down in order to provide that level of reasonable  
17 assurance without going overboard or going over the  
18 top, you know, as we pointed to earlier.

19 So you know, with that in mind, we know  
20 the process is important. And we know it takes time.  
21 But there's a degree to which there may be some  
22 unnecessary delays that could be avoided or minimized,  
23 you know, if we take a closer look at the processes  
24 and inform them based on the actual risk which is one  
25 of the things that we hope the white paper puts some

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1 light on and actually begins a discussion. You know,  
2 it's certainly not the answer. It's the beginning of  
3 a discussion that will lead to you know, we hope  
4 better information and some answers relative to some  
5 of the margins that actually exist. And that's not  
6 only true just you know, for away from reactive  
7 storage sites, but operating plants are also impacted  
8 by this as well.

9 You know, you have operating plants that  
10 every time you make a change to the approved content  
11 section of the Certificate of Compliance, you know,  
12 for fuel type or heat loading requirements, you could  
13 find yourself in a situation where there are identical  
14 casks at the same storage facility that are loaded  
15 under different amendments. So some of our numbers  
16 indicate to us that it's not unusual for a single  
17 ISFSI, a single dry storage facility to have somewhere  
18 between two and seven distinct and different sets of  
19 licensing documentation. And site specific  
20 calculations for casks that are essentially identical  
21 in design.

22 CHAIR BALLINGER: So are you suggesting a  
23 50.59 like process?

24 MR. RICHTER: Potentially. I mean that  
25 could be a model. Yeah, and just following along the

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1 thought here about new amendments. It takes about six  
2 months to a year of utility and vendor effort to put  
3 that together. And again, it's part of a very  
4 engaging and time consuming process where the impact  
5 of safety may not be relevant because there may be no  
6 real impact for the changes that are made. And I  
7 think we gain a lot of valuable information with the  
8 Orano pilot project on the graded approach as an  
9 example of the types of things that can be done under  
10 the auspices of the licensees or certificate holders  
11 and program, you know, outside of formal NRC review.

12 MEMBER MARCH-LEUBA: Mark, for my  
13 education, describe a little bit what you mean by a  
14 license amendment. Is it any time you add a new cask  
15 or is it when you have a new type of cask or when you  
16 reach a limit of the cask that you would authorize.  
17 When do you issue an LAR? Give me an example.

18 MR. RICHTER: Yeah. No, no, I think --  
19 and I may ask the staff to help out here. But I think  
20 the three examples you provided, all of those would be  
21 possibilities for a licensed amendment.

22 MEMBER MARCH-LEUBA: If I want to add one  
23 more cask of the same type once I'm already licensed,  
24 do you do any in LAR? You need to say it to the  
25 microphone.

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1 MR. WHITE: I'm sorry. Bernie White,  
2 Division of Spent Fuel Management. For storage cask,  
3 which is what he's talking about, if you have -- if  
4 you're loading a cask that's built under Amendment 2  
5 and you order two more casks under Builder Amendment  
6 2, you do not need to send anything to NRC for a  
7 license amendment or a certificate amendment as we  
8 would call it. Because it's already approved for what  
9 you're going to load. If you have a fuel assembly or  
10 decay heat or something like that, that's outside the  
11 bounds of what we have approved in the certificate,  
12 then one would.

13 MEMBER MARCH-LEUBA: So if they're loading  
14 a different type of cask --

15 MR. WHITE: Right. Right.

16 MEMBER MARCH-LEUBA: -- that is not  
17 approved --

18 MR. WHITE: Right.

19 MEMBER MARCH-LEUBA: -- they need to do an  
20 LAR.

21 MR. WHITE: Right. And we do have a set  
22 of 50.59 equivalent in Part 72. It's 72.48. We don't  
23 have it in transport, which is what the SSRP is about.  
24 And there are reasons why we don't have it in  
25 transport.

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1 MEMBER MARCH-LEUBA: On the transport,  
2 there is something equivalent to a licensee --  
3 operating license for transport?

4 MR. WHITE: No, we have a Certificate of  
5 Compliance for the design just like we do for storage.

6 MEMBER MARCH-LEUBA: And then once they  
7 have the certificate for this cask, they can ship  
8 1,000 --

9 MR. WHITE: You can do as many of them as  
10 you want. As long as they meet the design, you can  
11 make as many shipments as you want as long as they  
12 meet the design.

13 MEMBER MARCH-LEUBA: So you just have to  
14 certify for the limiting condition --

15 MR. WHITE: Right.

16 MEMBER MARCH-LEUBA: -- and don't do it  
17 again.

18 MR. RICHTER: Yeah. The 50.59 type  
19 process that you asked about, that's really the 72.48  
20 process that is embodied in NEI's 1204 Guidance  
21 Document, which is in the process of -- the most  
22 current Revs in the process of endorsement. So  
23 Industry would have, you know, the opportunity to use  
24 that as a model for that process -- the updated  
25 revision, which I think is coming out sometime in 2020

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1 -- early 2020, I think from what we've heard recently.

2 MR. RAHIMI: Can I --

3 MR. RICHTER: Sure.

4 MR. RAHIMI: Meraj Rahimi, Division of  
5 Fuel Management at NRC. I think what Mark listed here  
6 in terms of there are 72 different amendments, you  
7 know, these are in the context of storage. I think  
8 all this talk was in the context of storage casks.  
9 Which we have already embarked on this. This is what  
10 is in the technical specification, specific heat load  
11 patterns that is approved. And any time the licensee  
12 wants to put sort of a fuel with a different heat load  
13 -- they want to change the heat load pattern, that's  
14 what he's referring to. They have to come in for an  
15 amendment.

16 MEMBER MARCH-LEUBA: You probably mean an  
17 increased heat load pattern.

18 MR. RAHIMI: No, the heat load pattern --  
19 No, given the same heat load, there's a specific heat  
20 load pattern that, you know, you put in, in you know,  
21 internal because the top peak clad temperature is  
22 calculated based on the pattern. Even the heat --

23 MEMBER MARCH-LEUBA: So the loading of the  
24 cask --

25 MR. RAHIMI: The loading pattern, that's

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1 right.

2 MEMBER MARCH-LEUBA: So you have a  
3 different radial distribution?

4 MR. RAHIMI: That's right. So I think  
5 that's what Mark is referring to.

6 MEMBER MARCH-LEUBA: Is there no way to  
7 bound that so you don't have to do it again?

8 MR. RAHIMI: That's right. I mean you  
9 could -- we also have said that the -- I mean you  
10 could come in with you know, a 2D analysis for  
11 different combination per mutation of heat load  
12 pattern. And yeah, provide that. And that's --  
13 Actually it is sort of a subject of a topical report  
14 that has been submitted by one of the vendors now,  
15 specifically a method and approach that we can review  
16 and approve --

17 MEMBER MARCH-LEUBA: In operating plants,  
18 when you load a new core, you don't necessarily issue  
19 a license amendment as long as you use approved  
20 methods.

21 MR. RAHIMI: That's right.

22 MEMBER MARCH-LEUBA: So what you're saying  
23 we're missing here is a topical report that tells you  
24 the procedure that we follow. And as long as the  
25 follow-up procedure and the criteria is satisfied, you

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1 don't have to look at it?

2 MR. RAHIMI: That's right. That is the --  
3 currently you know, a topical report that we just  
4 received -- that we haven't received yet, that they  
5 have to talk with us. But on the graded approach,  
6 it's another effort that we are doing in terms of  
7 okay, all these things that were put on Tech Spec.  
8 Anytime they're outside of Tech Spec, of course they  
9 have to come in --

10 MEMBER MARCH-LEUBA: Sure.

11 MR. RAHIMI: -- for amendment. So is  
12 there any way you know, to come up with a bounding way  
13 that the -- not to tie them down?

14 MEMBER MARCH-LEUBA: Yeah, but there are  
15 two ways. Either you do a bounding calculation where  
16 you demonstrate that your new cask has a better power  
17 distribution than the old one -- than the bounding one  
18 or you have an approved methodology that he has to  
19 follow.

20 MR. RAHIMI: Right.

21 MEMBER MARCH-LEUBA: And approved criteria  
22 that he's satisfied and he's within that, yes, that's  
23 when I load fuel in my plan -- operating plan. I  
24 don't have to contact you.

25 MR. RAHIMI: That's right.

1 MEMBER MARCH-LEUBA: I just inform you  
2 what I'm doing.

3 MR. RAHIMI: Yeah. I mean this -- I mean  
4 the applicant, they're free, you know, to do that --  
5 come up with a bounding analysis, not specific to the  
6 you know, heat load pattern.

7 MEMBER MARCH-LEUBA: Yeah, it doesn't mean  
8 to be bounding. What I'm saying is in operating  
9 plants, I have approved topical reports that tell me  
10 how I analyze a LOCA.

11 MR. RAHIMI: Yeah.

12 MEMBER MARCH-LEUBA: And as long as I  
13 follow the methodology and my temperature is below  
14 2200 Fahrenheit, I'm okay.

15 MR. RAHIMI: Yeah.

16 MEMBER MARCH-LEUBA: I don't have to  
17 change the license. Is this not what happening here?  
18 Is this a case by case basis?

19 MR. RAHIMI: Yeah. I mean most of the  
20 time, I mean they look at, you know, their customers  
21 -- the cask vendors for this specific site. They say  
22 okay, this is the sort of total decay heat. You know,  
23 they have 45 kilowatts. So they sort of set the  
24 design based on total kilowatt and the kilowatt per,  
25 you know, cell. And they do the analysis. They say

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1       okay, this is the loading pattern and also the dose --  
2       the dose calculation comes into play with that, you  
3       know, loading pattern.  And that's when they analyze  
4       for.  But yes, I mean they can similarly you know,  
5       come in -- I mean look at the you know, different  
6       combination, not specific to the specific pattern as  
7       long as, you know, they demonstrate they meet the dose  
8       limit.  They meet the peak clad temperature limit,  
9       they're fine.

10                   MEMBER MARCH-LEUBA:  Yeah, but do they  
11       need to send you the calculations and you need to  
12       review them and sign them on the SAR?

13                   MR. RAHIMI:  No, if they haven't done  
14       that, right.  If it's the original -- if it was  
15       approved for a specific heat load, yes, you know, they  
16       have to come in.  But what I'm saying is that they  
17       don't -- I mean they have the freedom of you know,  
18       doing all different combination and do the analysis.  
19       And that's how the Tech Spec can be written.  And they  
20       don't have to come in.

21                   MEMBER MARCH-LEUBA:  I guess I'm a little  
22       confused then.  I mean, I see room for improvement.

23                   MR. RAHIMI:  Yes, certainly.  I mean we'll  
24       discuss that with the Industry.

25                   MR. RICHTER:  Right.  And you know, I

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1 think the bounding calculation on the one hand sounds  
2 appealing because you can do a -- create a large  
3 boundary that includes a lot of different combinations  
4 within that. But then you start infringing upon some  
5 of the -- some of the efficiencies that you hope to  
6 gain by being able to make some of these decisions on  
7 your own without having to come back in with a formal  
8 process. You know, there are some things that you  
9 know, we believe we should be able to change without  
10 seeking some approval or concurrence to do that. And  
11 you know, that gives the licensee flexibility in  
12 equipment they can load, what they load, how they load  
13 it. It gives them some latitude. And if the bounding  
14 captures everything, then you start giving up some of  
15 the flexibility that you hope to seek by achieving  
16 some independence, you know, using risk informed  
17 approaches like we're talking about here.

18 MEMBER MARCH-LEUBA: Yeah.

19 MR. RICHTER: I mean there's probably 100  
20 different examples you could name, but --

21 MR. RAHIMI: I mean you're right. I mean  
22 you start losing the efficiency because generally the  
23 cask vendors, they try to maximize the pay load --  
24 optimize the pay load.

25 MEMBER MARCH-LEUBA: The thing I hear from

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1 you and I'm certainly no expert or not familiar with  
2 this topic, all I hear is we'll hit the limits. We'll  
3 hit the limits. We'll hit the limits. I mean if the  
4 limit is 400 degrees or 300 degrees, we're getting at  
5 298 all the time. Because you want to load as many as  
6 you can.

7 MR. RAHIMI: That's right. You want to  
8 load as many as -- especially on the decommissioning.  
9 I mean they're loading two year cooled fuel.

10 MEMBER MARCH-LEUBA: Well I see the room  
11 for improvement is follow the line that we use -- the  
12 staff uses for breaking reactors where you license a  
13 process that they must follow with -- I mean you have  
14 to use the codes this way. You have to calculate this  
15 criteria. And this is how you do the calculation.  
16 And as long as you're below the criteria, you just  
17 send me the results and I don't need to sign. I mean  
18 that's how operating plans work.

19 MR. RAHIMI: Right.

20 MEMBER MARCH-LEUBA: They have their  
21 methods in Tech Specs that follow them. They don't  
22 have to call for an LAR error.

23 MR. RAHIMI: I agree. I agree. Yeah,  
24 that's --

25 CHAIR BALLINGER: You folks are arguing

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1 for a 72.48 process for transportation. Is that what  
2 you're arguing for back and forth here?

3 MR. RAHIMI: No.

4 CHAIR BALLINGER: No?

5 MR. RAHIMI: No, this was the most  
6 comments was in the context of Part 72 of the  
7 efficiency -- I think he's talking about it with  
8 respects to Part 72.

9 MR. RICHTER: Right.

10 CHAIR BALLINGER: Well I can tell you that  
11 there are at least nine revisions to the CoC for the  
12 HOLTECH-Hi-STORM 100. And I can tell you that there  
13 are at least 14, I think I remember it right, for the  
14 UMAX. So the CoC amendments, there's a lot of them.

15 MR. RICHTER: Right. Yeah and maybe I  
16 didn't set this up as well as I could have. But you  
17 know, a lot of the examples I had -- what we're  
18 talking about here, the 74 different amendment  
19 requests and so forth, that's true. It's all in the  
20 context of Part 72. But to that point and the white  
21 paper helps to address this. There are a lot of  
22 opportunities to look at some of those conservatisms  
23 that have been identified and to the degree that we  
24 can look at that and apply it to what we're doing in  
25 transportation, we want to be able to have that

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1 conversation.

2 I'm not saying it's a one for one mapping  
3 of 72 into 71. But there's a lot of opportunity that  
4 we've identified looking at storage that you may be  
5 able to leverage. It may be the seed of the next good  
6 idea, you know, for Part 71 or for transportation. So  
7 you know, I don't want to maybe oversell, you know,  
8 what we have in the white paper. Oversell what we've  
9 learned from looking at a 72 perspective. But only to  
10 suggest that we believe that there's probably a lot of  
11 opportunity there as well for transportation, just  
12 like we've found in storage. And you know, there's  
13 details, you know, to be developed. But you know, I'm  
14 hoping we're at the very front end of a long dialogue  
15 here to sort this out with staff and Industry.

16 MR. RICHTER: I think I'll conclude there  
17 because I think we've really talked around this final  
18 slide and what this is really all about. So to sit  
19 here and regurgitate four bullet points probably isn't  
20 going to add any value. But I think the discussion  
21 was good. And I think it kind of gets to what we're  
22 trying to do, which is improve efficiency and identify  
23 opportunities to do that based on margin.

24 MEMBER REMPE: Well since we're way ahead  
25 of schedule and while we're just opining on this white

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1 paper -- I actually pulled it up. I had not seen it  
2 before this meeting. It wasn't provided to us. What  
3 is the next step? Are you going to try and have a  
4 pilot project? I mean it's going to take -- if you  
5 did this, it will take a while for the staff to find  
6 a way to implement it --

7 MR. RICHTER: Yes.

8 MEMBER REMPE: -- and it will cost money  
9 for the staff, as well as the Industry. With the 74  
10 LARs, they've got a path forward. So you know,  
11 they've got a system that works. And to change it,  
12 yeah, it ought to be changed. Everybody agrees to  
13 this. But is it going to be cost-effective? And how  
14 do you -- What's the next step? And again, this is  
15 way beyond the discussion today. But I'm just  
16 curious. It's good to throw rocks.

17 MR. RICHTER: It's interesting you asked  
18 the question because I got an email this morning  
19 before I came up here for this meeting from someone  
20 from Andrew Cook's staff trying to schedule and set up  
21 an initial workshop between staff and Industry to have  
22 that exact discussion. You know, how do we take  
23 action? You know, how do we begin to approach some of  
24 the recommendations? You know, what can we take care  
25 of quickly? What's going to take, you know, more time

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1 and resources? So early next year, we're going to  
2 have that initial meeting. You may have more detail  
3 on that than I do, Meraj, so if can add to that.

4 MR. RAHIMI: Yeah, we did receive the  
5 white paper. And we're responding with the letters by  
6 December 20th to NEI, what the next step would be.  
7 And I think what NEI -- they presented the white paper  
8 at the public meeting that we had about a week ago as  
9 part of the Part 72 rule making. And a series of the  
10 workshop is being discussed at this point because that  
11 was the NEI's suggestion. You know, we agreed in term  
12 of the -- as he's listed, there are four specific  
13 technical areas that these recommendations touch on;  
14 source term, criticality, you know, safety, fuel  
15 qualification. And what NEI has specifically sited,  
16 the margin, you know, basically they say there is too  
17 much margin in there. For example, boron credit in  
18 BORAL. Why are you limiting us to 75 percent credits?  
19 You know, why not 90 percent? Why not 100 percent?

20 I mean there has been, you know,  
21 historical data based on that because of non-uniformed  
22 distribution of the ten for criticality safety. So we  
23 have to go back. I mean there is, you know,  
24 supporting data from 20 years ago. You know, why does  
25 staff, you know, have that position? So we agreed to

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1 really discuss and touch on these specific areas where  
2 we see what was reasonable or is too conservative, we  
3 can reconsider these positions. And that is what --  
4 that's what paper is really focused on. And also the  
5 bigger picture in terms of the -- how you could take  
6 the pilot -- we're about to finish these risk  
7 informing the Tech Spec. Taking a lot of stuff from  
8 the Tech Spec that really doesn't have that safety  
9 significance, putting in the FSAR. And that's another  
10 area of discussion in terms of how you can apply that  
11 approach to other designs.

12           So as Mark mentioned, there's 16  
13 recommendations in this white paper. And there are  
14 about four of them -- this is what Industry -- they  
15 believe they can do now on their own. There are three  
16 specific recommendations that the NRC, which is  
17 regarding risk informing. And there are 16 other --  
18 there are nine other recommendations -- seven or nine  
19 other recommendations more long-term like the peak  
20 clad temperature, why 400? What is the basis? And  
21 then what happens if you go, you know, beyond 400? So  
22 those specific areas. And we agree, we can -- I think  
23 that's basically what the response is going to be.

24           MR. RICHTER: Right. And I think  
25 everyone, at least between Industry and staff

1 recognize that a lot of the requirements that exist  
2 now in current regulation were based on as much a lack  
3 of specific knowledge 30 years ago as what we're  
4 trying to do now based on new and current knowledge  
5 that's going to inform, you know, a new regulatory  
6 framework. You know, because absent knowledge -- what  
7 do you do to be safe? You just add more margin just  
8 to be sure. Right?

9           So now, you know, with the benefit of  
10 history and better analysis over the last several  
11 decades, you know, Industry thinks it's time to maybe  
12 look again. And see if we can do something that  
13 aligns with the staff's need to provide the reasonable  
14 assurance and the Industry's desire to be more  
15 efficient. And somewhere those trajectories ought to  
16 cross.

17           MEMBER REMPE: There were some interesting  
18 recommendations in there. But I just am wondering how  
19 -- maybe you can get the low hanging fruit first and  
20 do something that increases efficiency for everyone.  
21 And then try and deal with some of the others.

22           MR. RICHTER: I think we're on the very  
23 front end of that process, trying to --

24           MS. DIAZ: This is Yoira Diaz from  
25 Division of Fuel Management. I just want to amplify

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1 what Meraj said with regards to this white paper. The  
2 question that you, Joy, asked about what is the cost  
3 benefit of going through all these recommendations.  
4 And what is the level of effort we're going to put in  
5 getting things done is the same question that we asked  
6 NEI to explain to us what is the cost benefit of doing  
7 any of these recommendations.

8 As you said, there are things in there  
9 that are low hanging fruits that we can implement  
10 tomorrow if we want to -- or the Industry can  
11 implement tomorrow if they want to. But we're more  
12 concerned about the long-term ones is how much we're  
13 going to get in terms of efficiencies from the long-  
14 term recommendations that NEI has submitted to us.  
15 And that's a question that we will have to discuss  
16 with the NEI in these workshops that we're going to  
17 plan to have early next year.

18 MEMBER REMPE: Okay, it will be  
19 interesting. Thank you.

20 MEMBER MARCH-LEUBA: But without doing the  
21 exercise, my guess is if they went into the trouble of  
22 writing those recommendations in the white paper, it's  
23 because they think it's worth it to them. They've  
24 already run the cost benefit in their mind. So of  
25 course it would be maybe other than in cost of

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1 implementing, this is the benefit you get. Now not  
2 the cost to you to transport it. But can we do it in  
3 six months unless it takes six years? And I'm going  
4 to start with the six month one. And I'm just  
5 targeting something.

6 MR. RICHTER: Yeah. And to your point,  
7 the cost benefit I think has been intuitively  
8 addressed, you know, by the suppliers and some of the  
9 licensees. You know, maybe they haven't put numbers  
10 on it. But intuitively they know, you know, we're  
11 doing this and it takes this much time. It costs this  
12 much money. But if we make these changes, we know it  
13 will take less time, cost less money, we'd be more  
14 efficient, et cetera, et cetera. The next step is you  
15 quantify it and try to put some numbers on it to  
16 demonstrate it.

17 MEMBER MARCH-LEUBA: My point is the cost  
18 you considered -- was this cost of shipping this cask  
19 from here to Nevada. NRC needs to consider is the  
20 cost it will take to get that modification in place.  
21 So even if you can save that much on Recommendation  
22 No. 13, but if it can be done in a week, that's the  
23 one I would vote for. So there are two costs. The  
24 cost you would save when you transport it and the cost  
25 it's going to take for the staff to get on board and

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1 be able to agree with you. And that second course, I  
2 don't think you have considered. So during the  
3 workshop, you should consider that cost.

4 MR. RICHTER: Good point. Thank you.

5 CHAIR BALLINGER: Well it's been  
6 constructive. And I mean that specifically, I think  
7 it's been constructive. Are there any other -- Are  
8 you all finished?

9 MR. RICHTER: I would just like to maybe  
10 follow up to your comment about this being  
11 constructive. I'm not sure that my portion of the  
12 presentation ended the way I anticipated that it  
13 would.

14 CHAIR BALLINGER: I'm being subjective.

15 MR. RICHTER: I understand. I am too.  
16 But I think it went in a direction that I think was  
17 positive. You know, it allowed us -- gave us a forum  
18 to discuss some of these other things. And kind of  
19 get them out a little bit more in the open. And you  
20 know kind of put some detail on it for those that are  
21 maybe a little bit newer to some of the issues. And  
22 I only see good coming from it. I've taken some notes  
23 here that I'm going to carry back in terms of how we  
24 characterized certain things. I'm sure staff has  
25 taken notes as well maybe with you know, help inform

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1 their understanding of our perspective on things. So  
2 I think, you know, as we heard into January, we both  
3 will come in a little better off than we were prior to  
4 today because we had this discussion. So for that, I  
5 appreciate the opportunity.

6 CHAIR BALLINGER: I think we now need to  
7 get public comments. If there's anybody in the room  
8 now that would like to make a comment. It looks a  
9 little sparse. Is the public line open? Is there  
10 anybody -- members of the public out there that would  
11 like to make a comment? Not hearing any static, I'm  
12 afraid that it's a dead line. Either that or we're  
13 just too good for a change.

14 MEMBER MARCH-LEUBA: We're in a different  
15 room. This one seems to work.

16 CHAIR BALLINGER: Oh, okay. Okay, not  
17 hearing any, by way of information, the staff is not  
18 interested in a letter. This was for information  
19 only. And we have not scheduled a full committee  
20 meeting. But that is not my call. That's the call of  
21 the members of this subcommittee. And I'm a little  
22 bit embarrassed -- actually a lot embarrassed that  
23 there's only three of us here. So what do you think?

24 MEMBER REMPE: I assume in you're asking  
25 what I think is whether do we need to have a letter on

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1 this --

2 CHAIR BALLINGER: Yes. No, no, they don't  
3 want a letter --

4 (Simultaneous speaking.)

5 MEMBER REMPE: -- is that what you're  
6 asking?

7 CHAIR BALLINGER: -- but it's up to us.

8 MEMBER REMPE: Yeah. I don't have any  
9 burning comments that would make it worthwhile to have  
10 a letter. So that's fine with me. I am interested in  
11 how this white paper moves forward with the staff.  
12 And so I hope when the staff has a good feeling about  
13 what they think they're going to do or not do, they'll  
14 come back and let us know. I think that the issue of  
15 spent fuel in the U.S. is an important issue that  
16 needs to be addressed in the area of Nuclear. And the  
17 U.S. has not been making much progress over the years.  
18 So I would like to hear back from you all.

19 CHAIR BALLINGER: We'll just keep getting  
20 informed.

21 MEMBER REMPE: Yeah.

22 CHAIR BALLINGER: Jose?

23 MEMBER MARCH-LEUBA: I'll second Joy's  
24 opinion. If the staff does not need a letter, I don't  
25 see writing a positive letter will make anything

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1 positive. So we will only write one if we have  
2 something negative to say. And I don't have anything  
3 negative to say. So I recommend not to write it.

4 MEMBER REMPE: However, we don't make  
5 decisions on our own. So you'll need to discuss this  
6 at P&P.

7 MEMBER MARCH-LEUBA: Right. I think we  
8 do. Typically we recommend the thing of the  
9 subcommittee.

10 MEMBER REMPE: Ron can come at P&P and say  
11 hey, we had this subcommittee meeting and the  
12 subcommittee members did not think a letter was  
13 necessary. And then we vote.

14 MEMBER MARCH-LEUBA: Yeah.

15 MEMBER REMPE: Because again, we aren't  
16 empowered on our own.

17 MEMBER MARCH-LEUBA: Yeah, you're more  
18 familiar with our bylaws than I am.

19 MEMBER REMPE: I'm getting more and more  
20 familiar with them than I thought I would ever have to  
21 be.

22 MEMBER MARCH-LEUBA: Typically we ask this  
23 question of our subcommittee and everybody says yes,  
24 we should have a letter because they're asking for  
25 one. This is the first time I've had this question

**NEAL R. GROSS**

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1 asked whether we don't need a letter.

2 CHAIR BALLINGER: We could push this out  
3 to 5:00 if we really want to.

4 MEMBER REMPE: I don't think so.

5 CHAIR BALLINGER: Bring in pizza or  
6 something like that. But absent of burning desire to  
7 continue, we are adjourned. Thank you.

8 (Whereupon, the above-entitled matter was  
9 concluded at 2:41 p.m.)

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# **ACRS Subcommittee Briefing on Draft NUREG-2216 the Standard Review Plan for Transportation Packages for Spent Fuel and Radioactive Material**

SRP Team  
Division of Fuel Management  
Office of Nuclear Material Safety and Safeguards  
U.S. Nuclear Regulatory Commission  
December 3, 2019

# Outline

- Background
- Goals
- Approach
- Public comments
- Summary



# Background

- Recognized the need to consolidate the Transportation Standard Review Plans (SRPs)
- Transportation SRPs issued in 1999/2000
  - NUREG-1609, "Standard Review Plan for Transportation Packages for Radioactive Material"
    - Supplement 1, "Standard Review Plan for Transportation Packages for MOX-Radioactive Material"
    - Supplement 2, "Standard Review Plan for Transportation Packages for Irradiated Tritium-Producing Burnable Absorber Rods (TPBARs)"
  - NUREG-1617, "Standard Review Plan for Transportation Packages for Spent Nuclear Fuel"
    - Supplement 1, "Standard Review Plan for Transportation Packages for MOX-Spent Nuclear Fuel"

# Background - continued

- Interim Staff Guidance (ISGs) documents were issued to assist in implementing changes to Part 71 and emergent issues
- Improved the structure for the SRP
  - Similar to NUREG-0800 structure
  - Modular chapters

# Goals

- Maintain the safe and secure transportation of radioactive materials
- Increase efficiency of reviews
- Minimize/eliminate the use of ISGs
- Improve efficiency of future revisions
- One SRP for all transportation package review guidance



# Approach

- Formed an internal NRC team consisting of staff from all technical disciplines
- Consolidated the review guidance found in NUREG-1609 and NUREG-1617
- Incorporated the MOX and TPBAR Supplements
- Incorporated ISGs and other technical guidance
- Updated figures and references to regulations related to review areas

# Technical Staff Updates

- NUREG-2216 does not introduce new staff positions on technical issues
- Incorporates staff review experience and practice for consistency of review
- Technical chapters were updated to consolidate all current transportation guidance
- Added two new chapters
  - Materials
  - Quality Assurance

# Public Comments

- Four public comment letters were received
  - NEI
  - ORANO
  - HOLTEC
  - Anonymous
- NUREG-2216 and Regulatory Guide 7.9, “Standard Format and Content of Part 71 Applications for Approval of Packages for Radioactive Material” need to be made consistent
- Formatting of the SRP or editorial comments
- Some public comments requested additional guidance; a need for new guidance would be considered in future revisions
- Many out of scope for this consolidation effort
- Other changes and clarifications

# Chapter 2: Structural

- Added ISG-1, Rev. 2, “Damaged Fuel”
- Added ISG-21, “Use of Computational Modeling Software”
- Public comments were varied in scope
  - Simple corrections
  - Clarifications
  - New information beyond scope of consolidation
- An example was to include statistical deviation in structural characteristics and accident evaluation ranges

# Chapter 3: Thermal

- Content was reorganized to align with current review practices
- Added ISG-7, "Potential Generic Issue Concerning Cask Heat Transfer in a Transportation Accident"
- Added ISG-21, "Use of Computational Modeling Software"
- Regulatory language was clarified
- Very minor edits were necessary to address public comments

# Chapter 4: Containment

- Added Table 4-1 showing the relevant regulations for each review area
- Added NRC Information Notice 2016-04, "ANSI N14.5-2014 Revision and Leakage Rate Testing Considerations"
- Changes of editorial nature
- Clarified terminology and discussions

# Chapter 5: Shielding

- Clarifies certain review topics throughout SRP
- Added ISG-6. "Establishing Minimum Initial Enrichment for the Bounding Design Basis Fuel Assembly(s)
- Added ISG-21, "Use of Computational Modeling Software"
- Minor edits or clarifications based on public comments
- Some new methodologies proposed by public, but were beyond the scope of this consolidation

# Chapter 6: Criticality

- Brought the SRP up to the current Part 71 regulations
  - Transport Index (TI) is replaced with
    - Criticality Safety Index (CSI) and
    - Transport Index
- Added ISG-8, Rev. 3, “Burnup Credit in the Criticality Safety Analyses of PWR Spent Fuel in Transport and Storage Casks”
- Incorporated ISG-19, “Moderator Exclusion Under Hypothetical Accident Conditions and Demonstrating Subcriticality of Spent Fuel Under the Requirements of 10 CFR 71.55(e)”
- Added ISG-21, “Use of Computational Modeling Software”

# Chapter 7: Materials

- Added chapter to provide review guidance
  - NUREG-1609 and NUREG-1617 did not have a materials chapter
  - Integrated guidance from ISGs
- Minor edits or clarifications based on public comments

# Chapter 7: Materials - continued

Materials Evaluation chapter incorporates information from the following interim staff guidance (ISG) documents:

- ISG-1 Revision 2: Classifying the Condition of Spent Nuclear Fuel for Interim Storage and Transportation Based on Function
- ISG-11 Revision 3: Cladding Considerations for the Transportation and Storage of Spent Fuel
- ISG-15: Materials Evaluation
- ISG-22: Potential Rod Splitting due to Exposure to an Oxidizing Atmosphere During Short-Term Cask Loading Operations in LWR or Other Uranium Oxide Based Fuel
- ISG-23: Application of ASTM Standard Practice C1671-07 when performing technical reviews of spent fuel storage and transportation packaging licensing actions

# Chapter 10: Quality Assurance

- Added chapter to:
  - Provide review guidance for package applications that contain a QAPD
- Content is similar to NUREG-2215
- Provides additional guidance for applications that reference a previously approved QAPD
- One comment questioning need for QA Chapter in SRP

# Summary

- NUREG-2216 is a consolidation of existing staff guidance
- The new SRP does not introduce new positions by staff
- Comments from the public indicated areas where additional clarification may be needed

# Backup Slides

# Interim Staff Guidance

- SFST-ISG-1, Revision 2 Damaged Fuel
- SFST-ISG-2, Revision 2 Fuel Retrievability
- SFST-ISG-3 Post Accident Recovery and Compliance with 10 CFR 72.122(l)
- SFST-ISG-4, Revision 1 Cask Closure Weld Inspections
- SFST-ISG-5, Revision 1 Confinement Evaluation
- SFST-ISG-6, Establishing Minimum Initial Enrichment for the Bounding Design Basis Fuel Assembly(s)
- SFST-ISG-7, Potential Generic Issue Concerning Cask Heat Transfer in a Transportation Accident
- SFST-ISG-8, Revision 3 Burnup Credit in the Criticality Safety Analyses of PWR Spent Fuel in Transport and Storage Casks
- SFST-ISG-9, Revision 1 Storage of Components Associated with Fuel Assemblies
- SFST-ISG-10, Revision 1 Alternatives to the ASME Code
- SFST-ISG-11, Revision 3 Cladding Considerations for the Transportation and Storage of Spent Fuel
- SFST-ISG-12, Revision 1 Buckling of Irradiated Fuel Under Bottom End Drop Conditions
- SFST-ISG-13, Real Individual
- SFST-ISG-14, Supplemental Shielding
- SFST-ISG-15, Materials Evaluation
- SFST-ISG-16, Emergency Planning

# Interim Staff Guidance

- SFST-ISG-17, Interim Storage of Greater Than Class C Waste
- SFST-ISG-18, Revision 1 The Design and Testing of Lid Welds on Austenitic Stainless Steel Canisters as the Confinement Boundary for Spent Fuel Storage
- SFST-ISG-19, Moderator Exclusion Under Hypothetical Accident Conditions and Demonstrating Subcriticality of Spent Fuel Under the Requirements of 10 CFR 71.55(e)
- SFST-ISG-20, Transportation Package Design Changes Authorized Under 10 CFR Part 71 Without Prior NRC Approval
- SFST-ISG-21, Use of Computational Modeling Software
- SFST-ISG-22, Potential Rod Splitting Due to Exposure to an Oxidizing Atmosphere During Short-Term Cask Loading Operations in LWR or Other Uranium Oxide Based Fuel
- SFST-ISG-23, Application of ASTM Standard Practice C1671-07 When Performing Technical Reviews Of Spent Fuel Storage And Transportation Packaging Licensing Actions
- SFST-ISG-24, The Use of a Demonstration Program as a Surveillance Tool for Confirmation of Integrity for Continued Storage of High Burnup Fuel Beyond 20 Years
- SFST-ISG-25, Revision 0 Pressure Test and Helium Leakage Test of the Confinement Boundary for Spent Fuel Storage Canister

# Part 71 Background

- DOT regulates
  - carriers (road, rail, air, etc)
  - Import and export of radioactive material
  - packages for small quantities of radioactive material – Type A Packages
- NRC
  - Regulates Domestic Type B and Type A Fissile Packages
  - Technical Review & Recommendation to DOT on Revalidation of Foreign Packages
  - Lead agency for inspection of NRC holders of Certificates of Compliance, fabricators, licensee shippers and carriers

# Part 71 Background (2)

## Part 71 Table A-1— $A_1$ and $A_2$ Values for Radionuclides

Symbol of Radionuclides	$A_1$ (TBq)	$A_1$ (Ci)	$A_2$ (TBq)	$A_2$ (Ci)
Co-60	$4.0 \times 10^{-1}$	$1.1 \times 10^1$	$4.0 \times 10^{-1}$	$1.1 \times 10^1$
Cs-137 (a)	2.0	$5.4 \times 10^1$	$6.0 \times 10^{-1}$	$1.6 \times 10^1$
Sr-90 (a)	$3.0 \times 10^{-1}$	8.1	$3.0 \times 10^{-1}$	8.1
U (enriched to 20% or less) (g)	Unlimited	Unlimited	Unlimited	Unlimited

- <sup>a</sup>  $A_1$  and/or  $A_2$  values include contributions from daughter nuclides with half-lives less than 10 days.
- <sup>g</sup> These values apply to unirradiated uranium only.

# Part 71 Background (3)

- NRC Approves Package Designs - **Primary safety is in package**
- Part 71 contains package approval standards (performance-based regulation)
  - Any licensee can use NRC-approved package
  - Agreement state licensee, DOE, and international shippers also use NRC-approved packages
- Approve packages via certificate of compliance for use with General License provisions
- General licensees must use the package in the manner in which it was approved

# Part 71 Background (4)

- Three safety functions
  - Shielding
  - Containment
  - Subcriticality
- Margins for safety functions after tests for
  - Normal conditions of transport and
  - Hypothetical accident conditions
- NRC approves the package design that was evaluated
- QA Inspection for package fabrication

# Part 71 Background (5)

