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NUCLEAR REGULATORY COMMISSION

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PUBLIC MEETING TO DISCUSS THE PART 53 RISK-INFORMED, TECHNOLOGY-INCLUSIVE REGULATORY FRAMEWORK FOR ADVANCED REACTORS RULEMAKING - SUBPART E RULE LANGUAGE AND REVISED PRELIMINARY RULE LANGUAGE

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THURSDAY

APRIL 8, 2021

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The meeting was held via Videoconference, at 10:00 a.m. EST, Bob Beall, Rulemaking Project Manager, Office of Nuclear Material Safety and Safeguards, presiding.

PRESENT

BOB BEALL, Rulemaking Project Manager, Office of Nuclear Material Safety and Safeguards (NMSS)

FRANK AKSTULEWICZ, Director, Division of New Reactor Licensing, Office of New Reactors (NRO)

DAVID DESAULNIERS, Senior Technical Advisor for Human Factors and Human Performance Evaluation, NRC

BRIAN GREEN, PhD, Human Factors Team Lead,
Office of Nuclear Reactor Regulation (NRR)
ROBERT LEWIS, Deputy Office Director, NMSS
BILL RECKLEY, Technical Lead, NMSS
JOHN SEGALA, Chief, Advanced Reactor Policy
Branch, Division of Advanced Reactors and
Non-power Production and Utilization
Facilities (DANU), NRR
JESSE SEYMOUR, Human Factors Engineer and
Operator Licensing Examiner, Division of
Reactor Oversight, NRR
MOHAMED SHAMS, Director, DANU, NRR
JUAN URIBE, Project Manager, Advanced Reactor
Policy Branch, NRR
NANETTE VALLIERE, Technical Lead, NMSS
ANDREA VEIL, Office Director, NRR

ALSO PRESENT

AMIR AFZALI, Southern Nuclear

ROBERT BUDNITZ

CYRIL DRAFFIN, U.S. Nuclear Industry Council

DENNIS HENNEKE, GE-Hitachi

PRASAD KADAMBI, PhD, Kadambi Engineering Consultants

MIKE KELLER, Hybrid Power Technologies

STEVEN KRAFT

EDWIN LYMAN, PhD, Union of Concerned Scientists

NIKO McMURRAY, ClearPath

JEFFREY MERRIFIELD, U.S. Nuclear Industry Council

ROSS MOORE, Oklo Inc.

MARTIN O'NEILL, Nuclear Energy Institute

EMMA REDFOOT, Oklo Inc.

FRANK SCHAAF

STEVE SCHILTHELM, BWX Technologies, Inc.

DOUG TRUE, Nuclear Energy Institute

KALENE WALKER

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

10:00 a.m.

MR. BEALL: All right. Good morning, everyone. I'd like to welcome everybody and thank you for participating in today's public meeting to discuss the Risk-Informed Technology-Inclusive Regulatory Framework for Advanced Reactors, or the Part 53 rulemaking. My name is Bob Beall and I'm from the NRC's Office of Nuclear Material Safety and Safeguards. I'm the Project Manager for the Part 53 rulemaking and will be serving as the facilitator for today's meeting. My role is to help ensure that today's meeting is informative and productive.

This is a comment-gathering public meeting to encourage active participation and information exchange with the public to help facilitate the development of the Part 53 rulemaking. The feedback that the NRC receives today is not considered a formal comment, so there will be no formal response to any of today's discussions.

Once again, we are using Microsoft Teams to support the public meeting on the Part 53 rulemaking. We hope the use of Microsoft Teams will allow stakeholders to participate more freely during this meeting.

Slide 2, please. The agenda for today includes staff and external stakeholder discussions on five topics related to the Part 53 rulemaking. Topic number 1 will be a discussion of a staff white paper titled, "Risk-Informed and Performance-Based Human Systems Considerations for Advanced Reactors." Topic 2 and 3 will be discussing changes to previously-released preliminary rule language and Subparts B and C. Topic 4 will be related to the preliminary rule language for subpart E, ''Construction and Manufacturing.'' The last topic will be discussion about the development of key Part 53 supporting guidance.

We will also have a 45-minute lunch break around 12:15 and at least one 15-minute break during the meeting. Please note that due to the number of topics and the expected discussion on these topics, the start times for topics 2 through 5 may need to be adjusted during the meeting.

Slide 3, please. I would now like to introduce Andrea Veil. Andrea is the Director of the Office of Nuclear Reactor Regulation. Andrea will be giving the opening remarks for today's meeting. Andrea?

MS. VEIL: Thank you so much, Bob, and

good morning, everyone. And thanks for participating in this very important series of meetings. First and foremost, the staff is committed to a number of items with regard to Part 53 rulemaking. For example, developing a technology-inclusive risk-informed regulatory framework; implementing a novel approach of releasing preliminary rule language to facilitate discussion such as we're doing today -- we recognize that this requires an iterative dialogue as language is refined and updated -- developing a framework that achieves the goals of the Commission's Advanced Reactor Policy Statement and NRC's principles of good regulation; building a transformative rule that considers stakeholder feedback and provides appropriate flexibilities commensurate with a demonstrated safety and security of the advanced reactor design; ensuring that we collect input from numerous stakeholders including industry, trade groups, non-governmental organizations, the public, and ACRS as we evaluate changes to the preliminary language.

We also recognize the importance of developing a regulatory framework that provides predictability and stability while accommodating various technologies.

And finally, the rule language will remain open for discussion as the staff works toward providing the Commission a draft proposed rule. Thank you, and I'll turn it back over to you, Bob.

MR. BEALl: Thank you, Andrea. Also, Jeff Merrifield from the U.S. Nuclear Industry Council would also like to make an opening remark. Jeff?

MR. MERRIFIELD: Yes. Thank you very much for recognizing me, and I'd like to thank Andrea for her opening comments, which I think are very helpful. I'm not going to repeat. We have prepared (inaudible) over the context of the meeting today regarding Subparts B and C and other elements of the proposal, so I'm not going to repeat all of that.

I do want to say a couple of things. First, we appreciate the very hard work that has been undertaken by the NRC staff and recognize that this is not easy. There's a very -- you know, we've got a set timeline of 2024 the Commission has set out to try to achieve this rule. As an organization with our industry counterparts, we're committed to try to work toward that. There are, obviously, a lot of balances in this effort. Some of it is providing a rule that is flexible but also providing more predictability, and that's sometimes a tough challenge to meet, and we

certainly understand and are also working through trying to meet those goals.

I want to say I very much, on behalf of NIC and others in the industry, very much appreciate Andrea's comments about the rule remaining open until we've seen what the totality of that looks like and can work on what makes sense for the Agency to meet its mission of protecting public safety and the environment through a rulemaking that would meet the adequate protection standard. And we certainly want to continue to work on that.

We will have comments later on today about the rewrites of Subparts B and C. We have questions. We have areas we very much appreciate the staff changes, and we'll certainly recognize those. There are others that will need to do some more work on our part, and we'll collaborate with other stakeholders to try to be productive in that regard.

As a general matter, I think -- I know there's an effort to try to get many elements involved in Part 53. We certainly would further encourage making that a bit more streamlined and not necessarily bringing in elements where they can be referenced in other parts, in just an agency rule such as Part 20.

In the end, I think we all should have the

same goal, and that is a rulemaking in Part 53 that is useful and will be sued and will meet the Agency's requirements for protection of public health and safety. That's a goal that we have. That's a goal we will continue to work on, and we look forward to working with all stakeholders to achieving that goal in the timeline the Agency has set out.

And with that, thank you very much. I look forward to a productive meeting today.

MR. BEALl: Okay. Thank you, Jeff. If there is anybody else who would like to make an opening remark, please raise your hands in the Teams header. Okay. Seeing none, I would now like to introduce the NRC staff who will be leading the discussions for today's topics -- myself, as the rulemaking project manager and the meeting facilitator and also Nan Valliere and Bill Reckley from NRR. Bill and Nan are the Part 53 technical leads for this rulemaking.

In addition, we will have members from the public who have requested time to discuss one or more of the topics from the Nuclear Energy Institute, the U.S. Nuclear Industry Council, and the Union of Concerned Scientists.

If you're not using Microsoft Teams to

attend this meeting and you would like to view the presentation slides, they are located in the NRC ADAMS document database and on regulations.gov. The accession number for today's slides is ML21088A279.

Slide 4, please. The purpose of today's meeting is to exchange information, answer questions, and discuss the Part 53 rulemaking. This is the third in a series of monthly public meetings where the NRC staff will discuss various topics related to the Part 53 rulemaking. Today's meeting will focus on the staff's white paper on staffing, training, and related human factors for advanced reactors and the second iteration of the Part 53 Subparts B and C proposed rule language.

In addition, we will be discussing the preliminary proposed rule language Subpart E and the development of supporting guidance for Part 53.

This is a comment-gathering public meeting, which means that public participation is actively sought as we discuss the regulatory issues. Because of the number of attendees, we may need to limit the time for an individual question or discussion on a topic to make sure everyone has a chance to participate. After everyone has a chance to ask us questions, we will circle back and allow people

to ask additional questions if we have time.

As I mentioned before, we are using Microsoft Teams for this public meeting. Today's meeting is using a workshop format so the number of formal presentations and the corresponding number of slides have been reduced to allot more time for open discussions on the various topics. This will also allow all of us to continuously ensure that we all -- this will also require all of us to continuously ensure that we have our phones muted and we are not speaking and do our best not to over -- do our best to not speak over each other.

To help facilitate the discussion during the meeting, we request that you utilize the raised hand feature in Teams so we can identify who would like to speak next. The staff will call on the individual to ask their question. The raised hand button, which is shaped like a small hand, is along the top row of the Team's display area. You can also use the chat window to alert us if you have a question.

Please do not use the chat window to ask or address any technical issue about the Part 53 rule. The chat window is not part of the official meeting record and is reserved to identify when someone has a

question and for handing any meeting logistical issues.

To minimize interruptions, the staff will call on participants who have used the raised hand feature or the chat window to identify that they have a question or comment.

If you joined the meeting using Microsoft Teams bridge line, you may not have access to these features. If you would like to ask a question or provide a comment, you will need to press the star 6 button to unmute your phone.

The staff will pause at the end of each topic to ensure all participants have had an opportunity to ask a question before moving on to the next topic.

After your comment has been discussed, your phone line will be muted again. If you would like to ask additional questions on a future topic, you have to press the star 6 to unmute your phone.

If there is a particular topic you would like to discuss, please send me an email after the meeting, and we'll try to include it in a future meeting.

This meeting is being transcribed so in order to get a clean transcription and to minimize

distractions during the meeting, we ask everybody to please mute their phones when they're not speaking and to identify themselves and the company or group they may be affiliated with. A summary and the transcript of today's meeting will be publicly available on or before May 1, 2021.

Finally, this meeting is not designed nor intended to solicit or receive comments on topics other than this rulemaking activity. Also, no regulatory decisions will be made at today's meeting.

Please note that towards the end of the presentation, there are two slides containing acronyms and abbreviations that may be used during this meeting and a set of backup slides that contain additional information about the Part 53 rulemaking.

And with that, I'd like to turn the meeting over to Bill Reckley to start the discussion on the Part 53 rulemaking. Bill?

MR. RECKLEY: Okay. Thanks, Bob. If we can go to slide 5? So as Bob mentioned, the discussions today are going to focus on the second iteration language that we released on Subparts B and C related to the higher level safety objectives and the design and analysis of Subparts. We released likewise language on Subpart E for construction and

manufacturing, and we look forward to that discussion especially in the area of manufacturing, just so we can get a better feel for what stakeholders might envision for using a manufacturing license and as a possible tool in the deployment.

I think we can go to the next slide. This shows the schedule and we've used this slide throughout. And as you can see, we're in April and our objective is to have a framework developed in two or three months from now so that's going to remain a challenge, as Andrea said. These are iterative processes as we develop the different subparts and put them together, but we just like to show this slide to reinforce the challenge that's before us.

One of the things you can see is that we're beginning to introduce the operations area, which is a key area for us to begin the discussions on, because they're wide-reaching and will entail trying to put the puzzle together and demonstrate the flexibilities that can be afforded in the operational phase from some of the things we've already been talking about in terms of the safe(inaudible)criteria and design.

And one of the topics that is key to operations is staffing, and that is going to be the

subject of the next presentation by Juan Uribe and Jesse Seymour. So with that, if we can go to the next slide, and Juan, you're up.

MR. URIBE: Yes, Bill. Thank you. Can you hear me? Just a quick --

MS. VEIL: Yes.

MR. URIBE: -- sound check. Perfect. All right. So good morning, everybody. I hope this meeting today finds everybody well during these difficult times. My name is Juan Uribe. I'm a Project Manager in the Advanced Reactor Policy Branch, which is part of the Division of Advanced Reactors and Non-Power Production and Utilization Facilities. I'm the Project Manager for the development of this paper and in conjunction with Jesse Seymour, who is a Reactor Operations Engineer in the Division of Reactor Oversight, and he's the lead technical reviewer and main author of the paper. We will be discussing an overview of the contents described in the draft white paper titled, "Risk-Informed and Performance-Based Human System Operation Considerations for Advanced Reactors."

And -- but before we move on, I also want to acknowledge the contributions from the rest of the working group members for the development of this

first draft. With that, next slide, please?

Okay. So to accomplish the briefing or the presentation today, we'll first start with a quick background. We'll then cover the nexus of this white paper which will eventually become final guidance to 10 CFR Part 53. Jesse will spend the bulk of the presentation going over an overview of the paper, and we'll wrap up with some next steps and future activities for the paper and also address some questions and comments.

Because we do have a fairly significant amount of information that we want to make sure to cover, perhaps for this presentation, what I'd like to ask is that to the extent possible, we hold off on questions until after the presentation has concluded just to make sure that we're respectful of time and that we are able to cover the material. We have a lot of the -- a generous amount of time for questions at the end of the presentation so that we can ensure that we hear your feedback and your comments. So with that, let's get started.

Next slide, please.

Okay. So for anything 10 CFR Part 53 and associated activities, it's always prudent to start with NEIMA as sort of the background and what it

required NRC to accomplish. So NEIMA, as you are all aware, was signed into law January of 2019 and requires the NRC to complete a rulemaking to establish a technology-inclusive regulatory framework for optional use for commercial advanced nuclear reactors no later than December of 2027. However, the NRC Commission approved the staff's proposed rulemaking and accelerated the completion timeline to October of 2024. And these are the activities that you'll hear more about today regarding 10 CFR Part 53.

While we recognize that the final rule will set the requirements in some areas, we also recognize that in some cases, it's the guidance in support of the proposed rule that may be the driving factor to meet the technology-inclusive performance-based criteria that will define a modern risk-informed graded approach.

So the white paper to be discussed today provides background and initial considerations on key areas of advanced reactor operations, and they're really meant to solicit feedback from external stakeholders and begin the dialogue. And the topic of operations in general, I should say, and how different advanced reactors may operate from the more traditional large light water reactors is not new.

It's been around for some time and just for the benefit of providing some quick examples, you know, on November of 2019, NEI submitted a white paper related to micro-reactor policy issues with a dedicated appendix to operator requirements. On March of 2010, we issued a SECY paper related to policy and licensing considerations for SMRs. On October of 2020, NRC issued SECY-20-0093 which also discussed policy and licensing considerations for micro-reactors, and there were specific sections in there with regards to staffing, training, and qualification requirements and also the subjects of autonomous and remote operations.

And so we felt it was a prudent time to use that lens to -- the Part 53 lens to revisit these topics, and so the development of this key guidance was developed under that premise. And as Bob alluded to, key guidance is a subject for today's presentation. I think it's the last topic in the agenda, and Bob and Bill Reckley and Nan will go over that in more detail later on.

Next slide, please.

Okay. So again, the purpose of today is to go over the white paper titled, "Risk-Informed and Performance-Based Human System Operation Considerations for Advanced Reactors." The paper was

released March 25th. The ML Number is located down in the lower part of the slide. And the slide on the -- the box on the right has been regularly presented by the Part 53 working group, and it gives you a high-level overview of the different subparts that make up the rule. The purpose of having that slide here is so that you can start to get an idea how the pieces fit together and where we see this guidance supporting the rule.

So if you look at the box highlighted in red under Subpart F, it discusses the staffing and programs. So we see this white paper and its evolution into final guidance supporting this specific Subpart. Again, it has been identified by key guidance in support of the rule. We've also conveyed or communicated this to the ACRS in our March 17th presentations. And what this means is that, you know, based on the limited resources and availability that the NRC has, this is guidance that we would prioritize such that it is completed or close to final upon completion of the rule.

Diving a little bit deeper into the paper, again, the topics address the verse and novel operational characteristics for operations including automation, staffing, and qualification of operator

personnel, evolution of control concepts, and the application of human factors engineering. And Jesse will do a much better job than I will and we'll dive into these topics shortly.

I just want to give you one more slide -- next slide, please -- so that, again, you leave with a sense of how this fits into the Part 53 rule, which is a question that we get a lot. And so this slide here is just another way of presenting to you how the pieces fit together. So once again, this slide attempts to dissect Part 53 into the different Subparts. And if you look at the right-hand side, there's a pop-out coming from Subpart F. And what is shown below is a proposed table of contents. Please recognize that that may change but as you see in the individual table of contents, in the staffing an operations, this is where this guidance would fit in.

I believe in prior meetings for Subpart F, the facility safety program was already discussed, and language related to staffing and operations should be released in the coming weeks or months.

And last thought I'll leave before turning it over to Jesse is this -- the guidance in this white paper and how it will become in its final form has the primary purpose of informing and supporting Part 53

rulemaking by supporting Subpart F. But the secondary goal is also to facilitate the consistent treatment of advanced reactor applications that are received or may be received prior to Part 53 being finalized.

As a concluding thought before turning it over, once again, the goal is to have guidance that is flexible, that is technology-inclusive, and that provides for a performance-based scaled review that just can measure it with the technology and the risk hazards. So with that, I'll turn it over to Jesse to dive deeper into the paper. Jesse?

MR. SEYMOUR: Thank you, Juan. If we could just move on to the next slide, please? Thank you.

My name is Jesse Seymour and I'm a human factors engineer and operator licensing examiner in NRR. I'm one of the people who worked on the paper that we'll be discussing, and I'm going to present an overview of the recent draft white paper that was issued. My presentation will follow along with the paper's general structure and content, so there shouldn't be anything that I cover here that isn't already covered in the paper already. Also, the paper goes into much more depth on many of these topics and for the sake of time, I'll just be summarizing many of

the key points now.

The paper covers a lot of ground, so to keep things moving, as Juan mentioned, we'll try to hold questions and discussion until the end. The general approach taken in the white paper was to provide a background discussion on important considerations and the existing regulatory framework followed by articulating objectives for the Part 53 rule to address those considerations and then to propose some potential approaches and options for addressing specific aspects of those objectives.

Some key drivers behind this white paper are recognition that the regulatory framework for advanced reactors should be capable of addressing novel operational concepts for a wide variety of advanced reactor technologies; also that some advanced reactor designs may present very little radiological risk and that the requirements in the current regulatory framework for large light water reactors might be unnecessary for a reasonable assurance of safety. Lastly, also that the development of a risk-informed, performance-based and technology-inclusive framework that appropriately considers the role of humans and human system integration is warranted for advanced reactors.

Next slide, please.

The preceding decades, I have witnessed some evolutionary changes in areas like passive safety and modular construction. The wide range of technologies that are under various stages of developments include small modular reactors, non-light water reactors, and also fusion-based technologies are on the horizon as well. Technologies such as those warrant careful consideration of design attributes that represent departures from the large light water reactor designs that we're accustomed to. Consistent with this, the NRC recognizes the desirability of attributed such as simplified safety features, a passive or inherent nature, reduction in required human actions, incorporation of defense-in-depth, and minimization of the risks associated with severe accidents in advanced reactor designs.

Next slide, please.

Advanced reactors could vary in size from very large to very small. Variations such as those are expected to have implications for both the source terms sizes and also for accident consequences. So how does that influence our thinking regarding operations? First, accident source terms can serve as a measure of the efficacy of mitigation features.

Secondly, advanced reactor designs may present low potential accident consequences. Considerations like those are informative because limiting the hazard posed by a reactor facility reduces the potential for accident consequences and is the most reliable means of ensuring safety.

Next slide, please.

Passive safety features and inherent safety characteristics have considerable potential to influence the role of personnel at advanced reactor facilities. As an example, passive safety features tend to shift humans into more of a defense-in-depth role. Passive safety features can still fail under certain conditions, though.

By comparison, though, inherent safety characteristics can be considered to be absolutely reliable. The incorporation of various inherent safety characteristics, passive safety features, and automated safety systems into a design are expected to influence the concept of operations for a proposed facility which, by extension, would be anticipated to affect the degree the degree of emphasis placed on the human factor engineering aspects of an application review.

Next slide, please.

Since autonomous operation is a major point of consideration for advanced reactors, let's take a moment to touch upon some of the key points regarding automation. As an overview, automation is implemented in levels that span from manual operations at the lowest level up to fully autonomous operation at the highest level. Autonomous operation, which is full automation, has the potential at its maximum extent to support potentially unattended reactor operations.

However, even in an autonomous design, there may still exist the need for humans to implement manual operations under certain circumstances such as for defense-in-depth. Another factor to keep in mind is that under less than fully autonomous settings, while automation generally enhances operational performance, there still remain other operational effects that must be considered as well. A prominent example of that is the potential for operators to potentially lose the proficiency with taking manual control of processes when needed.

Next slide, please.

Advanced reactor designers may desire to incorporate load-following capabilities into their designs. Load-following where a grid control center

can directly adjust plant output is not currently practiced by commercial nuclear facilities in the U.S. on account of being precluded by existing regulations. However, that is not the case internationally, as an example, France. This provides us with a body of international operating experience that we can draw upon on this subject.

As an example of how we can draw upon that operating experience, a key takeaway from international practice about the particular form of load-following is that a nuclear power plant needs to be able to refuse load-following requests when complying with those requests would violate technical specifications or result in other unsafe conditions.

Next slide, please.

Now let's transition to a discussion to considering the implications of defense-in-depth (inaudible) operations. The NRC has had a longstanding policy of ensuring that defense-in-depth is incorporated into the design and operation of nuclear power plants. While there are a number of important aspects of defense-in-depth, there are two key philosophical principles that I wish to emphasize here. With the context of our present discussion, it should be recognized that defense-in-depth approaches

should not rely solely upon a single operational feature and should neither rely excessively upon human actions.

Next slide, please.

With regard to staffing, in the past, the NRC staff recognized the limitations of the prescriptive requirements of 10 CFR 50.54(m) and in response, developed NUREG-1791 in order to allow for increased flexibility by providing guidance for assessing exemptions to the regulations in 10 CFR 50.54(m). With that being said, we recognize that licensing future advanced reactors by means of having to rely upon exemptions from prescriptive staffing requirements may not be an efficient or practical long-term regulatory framework. Thus, we recognize that an alternative means that is not reliant upon NUREG-1791 may be beneficial, especially if such a means were to rely upon analysis that could be scaled with a risk of the facility.

Next slide, please.

Now let's turn from staffing to the specific topic of operator licensing. Operator licensing has a long history in the U.S. with the first regulations governing it dating back to around 1956. Operator licensing has a basis in statute with

the Atomic Energy Act of 1954 requiring the NRC to prescribe uniform operator licensing conditions. Today all license exams are approved and administered by the NRC staff.

However, again, we realize that advanced reactor operational concepts may not align well with the existing power reactor operator licensing framework that we've established for power reactors. Some examples of changes that might be appropriate for advanced reactors could include things like making allowances for varying the licensing examination scope on a facility-specific basis and modifying simulator requirements. Keep in mind that these are just some high-level examples. The bottom line is that we believe that a revised approach to operator licensing should be able to flexibly and efficiently address a wide variety of advanced reactor designs.

Next slide, please.

Staffing of power reactors also includes the shift technical advisor or STA position. Unlike licensed operators, STA requirements are primarily routed in Commission policy and not regulation or statute.

Our current STA policy interpretation is that on each shift, there should be at least one

person on duty who has a degree in physical science, engineering, engineering technology, or a professional engineering license. The function of this person is to provide independent engineering expertise, accident assessment, and technical advice to the main control room operators.

For now, the key takeaway here is that the elimination of the STA position at a power reactor facility would be a departure from existing Commission policy as well as from longstanding agency and industry practice.

Next slide, please.

Training is another important area for us to consider here as well. The Nuclear Waste Policy Act of 1982 directs the NRC to establish regulations for the training and qualifications of nuclear power plant operators, supervisors, technicians, and other operating personnel. This Act also directs the NRC to establish requirements for simulator training, re-qualification examinations, operating tests, and instructional requirements. What's so important about this? Simply that certain aspects of nuclear training are spelled out in statute and thus are areas which any approach that we take must adhere to.

While we're on the subject of training,

let's also take a moment to touch upon the systematic or systems approach to training. SAT currently plays a central role in current nuclear training and qualifications programs. Why is it that we emphasize the SAT process here? Because the SAT process is generic in nature and can be adapted to any reactor technology including those associated with essentially foreseeable advanced reactor designs.

Next slide, please.

Another central focus that our present effort involves human factors engineering. At present, applying human factors engineering in the design of a nuclear power plant control room is required under existing post Three Mile Island regulations. Our current human factors engineering reviews typically focus on the human system interfaces that are located within control rooms.

Moving forward, though, should include examining how human factors will be used and implemented most effectively for advanced reactors. To that end, new approaches such as transitioning to an efficient, scalable, human factors engineering review process and even thinking beyond the confines of traditional control rooms should be considered. As a step towards achieving this, we believe that a

concept of operations can be a valuable tool in helping us gain the design understanding necessary to conduct appropriate human factors engineering reviews for advanced reactors.

Next slide, please.

While our existing human factors engineering focus is on control rooms, we recognize that some advanced reactor facilities may not opt to utilize traditional control rooms in their designs. Because of this, requirements addressing matters associated with control rooms will need to be revisited in Part 53 with an understanding that the functions involved may become decentralized in an advanced reactor facility. One potential implication of this is that human factors engineering requirements will essentially need to be able to follow important functions if they are relocated outside of a traditional control room. Beyond this, it may also be necessary to account for the potential emergency of functions that have no precedent within traditional control rooms as well.

Next slide, please

Let's think back to our earlier discussion on automation. What are the implications of removing all of the licensed operators from a facility? Well,

for such a fully autonomous advanced reactor facility, it should be noted that the existing regulatory framework also assigns certain responsibilities of licensee organizations to their licensed operators. A key example of this are the requirements of 10 CFR 50.54(x) and (y) for departures from license conditions, under emergency situations I should add. Beyond this, there are numerous other licensed operator administrative responsibilities that are both important to safety and derive from regulatory requirements. Such responsibilities will need to be addressed as well. These include compliance with technical specifications, operability determinations, NRC notifications, emergency declarations, and compliance with radiological release limits.

Next slide, please.

Now we covered a broad range of background considerations in getting to this point. At this stage, we're going to shift gears and consider some objectives for our Part 53 rulemaking that can help us to address the areas that we've covered so far.

First, the rule should recognize that staffing, training, operator licensing, and human factors are interrelated areas. Diverse advanced reactor technologies will necessitate integrating

review of these areas under a flexible approach. The rule should also account for varying accident consequences.

Additionally, the rule should require a human factors engineering program that is adequate to ensure that personnel can understand plant status, take action to ensure safety, and perform other important technical and administrative functions with safety implications. Regarding that last point, the human roles associated with the management and availability of plant-specific safety functions should be taken into account when considering human factors engineering requirements.

Next slide, please.

Continuing on, the rule should account for designs that do not utilize traditional control rooms. Additionally, the rule should ensure that the operator licensing process can accomplish the following items; first, compliance with applicable statutory requirements, specifically, the Atomic Energy Act and the Nuclear Waste Policy Act; second, conformance with accepted testing standards; third, facilitation of consistent and reliable licensing decisions by the NRC; fourth, the efficient use of NRC and facility licensee resources; and finally, provision of

reasonable assurance that operators will be able to manage plant-specific safety functions.

Next slide, please.

The rule should allow for consideration of innovative features intended to make new designs safer while also accounting for uncertainties associated with new approaches. The rule should, in a non-prescriptive manner, require staffing levels needed to support safe operation and allow for the possibility of demonstrating that no human presence is necessary. That said, the rule should also prescribe minimal requirements that must be met to not use licensed operators at all. Furthermore, the rule should ensure that advanced reactor defense-in-depth approaches do not rely exclusively upon single operational features or rely excessively upon human actions.

Next slide, please?

The only objectives discussed thus far, the rule should account for the possibility of load-following where the load changes themselves are controlled externally from a grid control center. Separately, the rule should also require that sufficient information be submitted to facilitate reviews as outlined within these goals. Examples of this type of information may include the following;

the concept of operations for the design. Another example would be functional requirements analyses that can describe the features, systems, and human actions relied upon for safety. Another example would a staffing plan with the supporting HFE-based analyses to back it up. And a final example would be a SAT-based training program for the relevant staff at the facility.

Next slide, please.

Now that we've discussed objectives of the Part 53 rule, let's turn to the last segment of the presentation in which we'll discuss some potential solutions that might help us to put those objectives into action. As we go through these, please keep in mind that some aspects of what we're talking about would potentially end up being incorporated into rule language while other aspects would be developed into regulatory guidance documents. For simplicity, we'll just focus on the main ideas here.

We'll start by talking about scalable human factors engineering reviews. We've initiated work under contract with Brookhaven National Laboratory to develop a method for scaling the scope and depth of human factors engineering reviews for advanced reactors. The objective of this effort is to

enable the staff to readily adjust the focus and level of staff human factors engineering review efforts based on factors such as risk insights and the unique characteristics of the design or facility's operation.

In the interim, though, the NRC staff also still have the ability to adjust the scope of our traditional NUREG-0711, human factors engineering reviews, on a case-by-case basis should a given license application warrant a reduction in scope of a human factors engineering review technical review.

Next slide, please.

Next, let's discuss potential criteria that could justify not using licensed operators at an advanced reactor facility. To justify not using licensed operators, it must be demonstrated that adequate protection of the public health and safety will exist in the absence of any operator action for preventing or mitigating accidents. The following are examples of criteria that could potentially be used for assessing the acceptability of an advanced reactor design operating without using any licensed operators. One, the accident analysis for the design should demonstrate that radiological consequence criteria will be met without reliance on human options for event mitigation, defense-in-depth, or safe shutdown.

Next slide, please.

Two, safety of the design should rely upon inherent safety characteristics. Absent an operator presence, the absolute reliability of inherent safety characteristics would be key.

Three, if not fully autonomous, then the design should have a sufficient level of autonomy to support safety without human action. If human action is needed for startup, though -- so in this case, we're talking about a, you know, design that would be autonomous except for initially starting up -- so if human action is needed for startup, it may be appropriate to have a licensed operator conduct the reactor startup or alternatively demonstrate that safety analyses bound all postulated errors by a non-licensed operator conducting the reactor startup. Our perspective is that that would be warranted because a non-licensed operator's abilities would not provide us with the same degree of assurance as those of a licensed operator.

Next slide, please.

Fourth, license conditions should be established for the facility by which those administrator responsibilities with safety implications, for example, complying with technical

specifications, that would otherwise have been allocated to licensed operators are reassigned appropriately. And for example, that could be to a designated facility manager position.

Lastly, although not necessarily a licensed operator, for the STA position, the staff would need to engage with the commission on a proposed departure from policy should an applicant propose a staffing plan that does not include on-shift engineering expertise. A key consideration would likely be the applicant's ability to demonstrate that the results of a staffing-related analysis remain adequate in the absence of the on-shift engineering expertise provided by an STA.

Next slide, please.

Now let's talk about how we can take a flexible and efficient approach to operator licensing. A flexible process that advanced reactor vendors and licensees could use to develop an operator licensing exam program for their science might consist of the following: job task analyses used to identify knowledge, skills, and abilities related to the facility's operator role would be determined as the first step of the process.

Next, training and evaluation methods

would be selected using a systems approach to training process, and that would also include determining for that facility what the exam composition would look like. Next, the vendor or licensee would pilot the proposed examination. The subsequent step would involve the exams themselves being reviewed and administered by the Nuclear Regulatory Commission staff. However, one potential option or variation on that last point would be for vendors or licensees to administer their own license examinations.

Again, it's important to note that the NRC would still that the NRC would still retain the final licensing authority in any case.

Next slide, please.

Recall that earlier I mentioned the value of the concept of operations and helping us to understand a new design. There is currently no regulation requiring applicants to provide a concept of operations as part of their applications. However, new designs will likely conceive of radically different concepts of operations for which we, as the NRC staff, may have little or no prior understanding. Again, keep in mind that we're used to reviewing actions that are associated with large light water reactors for the most part. Therefore, there may be a

need to explicitly make the concept of operations a part of the content of applications under the proposed Part 53 rule.

The description of the concept of operations would help the NRC staff to avoid confusion, understand and confirm to what extent a design relies on the humans for safe operation, and determine the appropriate scope of the staff review as well as reducing the potential need for requests for additional information as part of the review process.

Next slide, please.

Turning back to the subject of staffing, in lieu of taking a prescriptive approach to staffing in Part 53, it may be appropriate for applicants to propose their own alternative staffing models. At a minimum, an HFE, so the human factors engineering-based staffing analysis of sufficient scope and depth to allow the NRC staff to adequately assess the acceptability of the proposed staffing levels would be needed in order to do that.

Alternative staffing models for advanced reactor applicants could be informed using the existing process of NUREG-1791. It may also be appropriate for the Part 53 rule to provide a prescriptive staffing model as an option for

applicants that prefer not to conduct the staffing analyses needed to support an alternative flexible staffing model.

Next slide, please.

Finally, how does human factors engineering fit into the picture for advanced reactors? Applications are likely to need to contain specific information that is expected to be of a human factors engineering programmatic nature. For example, designs of control room human system interfaces or proposals for alternative staffing models would be expected to apply human factors engineering principles. We believe that Part 53 will likely need to require advanced reactor applications to address the incorporation of state-of-the-art human factors engineering principles more comprehensively than existing regulations require at present.

An advanced reactor human factors engineering program should be adequate to ensure that humans can perform a full range of tasks necessary to ensure the continued availability of plant-specific safety functions. This may also extend to maintenance and testing activities related to those plant-specific safety functions.

With that being said, now I'd like to go

ahead and turn the discussion back over to Juan Uribe for some additional final thoughts. Next slide, please.

MR. URIBE: Thank you, Jesse. And so before we begin with the allotted time for questions, I'd like to finalize with some thoughts. Again, the concepts -- the draft concepts that Jesse alluded to in the white paper are meant to solicit feedback on key areas of advanced reactor operation and begin the stakeholder discussions. The final scope of this paper and what the guidance would look like is evolving and will be determined in the coming months.

We do want to emphasize again that well-defined and unambiguous criteria is critical for a performance-based graded approach related to operations. So also in the coming months, we'll look to ways to incorporate and leverage the results of existing methodologies that you might have heard in other meetings such as the LMP process, maximum hypothetical accident, the deterministic insights, PRA insights, etcetera, all of those will be explored so that we can leverage analyses that are already being addressed and discussed in other meetings for the benefit of defining criteria in this paper.

Last thought is that the white paper, the

concepts in the white paper are intended for future 10 CFR Part 53 applicants. However, we -- as Jesse alluded to, we may use the concepts described in this paper to inform proposed exemptions from Part 52 requirements for near-term applicants in order to ensure consistency.

I do want to also make note that the subject of remote operations, which is different than autonomous operations, is not being considered for inclusion in this paper. Based on initial outreach during the development of the paper with other federal agencies and our international partners, we were not able to identify any near-term applications that are considering remote operations as part of the business strategy.

In addition, given the wide array of technical issues already included in the paper that Jesse discussed plus the unique set of issues that need to be considered and addressed for remote operations, we felt that this was the right approach.

There is, however, a longer term future-focused research initiative being led by the NRR Division of Risk Assessment that has already started looking at what would be the policy and licensing considerations for remote operations. That effort is

not tied to Part 53. And we do anticipate that the final guidance or this white paper, as it evolves, will be used to inform the remote operations activity.

Next slide, please.

So with this slide, I just want to perhaps share some next steps and future activities related to this paper. We're obviously continuing to socialize the white paper. We'll have additional public stakeholder interactions and ACRS interactions in the coming weeks and months.

As I mentioned, the NRC is evaluating the resource and the schedule in support of the rule to identify what areas of the guidance to prioritize. And so in the coming weeks, we'll also be working on a more detailed timeline that provides a more detailed visualization of the components of this guidance.

And what the final form of this guidance will look like is still being evaluated but preliminarily, we're considering either a different set of ISGs or having a regulatory guide. It all depends on the timing.

And finally, you upon completion of the final guidance, we see this as an integral part or an important part to be incorporated by reference into other key guidance. And for some of those of you that

are familiar with the advanced reactor content of application project, we believe that this is also a prudent place to reference this and also inform the safety analysis report of any advanced reactor application or an area outside the SAR but also part of an application.

So just wanted to share some last thoughts. With that, we can go to the next slide. And we'll be ready to address and take any questions that you may have and the information -- my email is there in case we don't get to cover all the questions or that you identify a question or a comment later on after the meeting. I will be compiling those and passing them along to the working group member. So with that, thank you.

MR. BEALL: Okay. Thank you, Juan. Can we go to the next slide, please? So before we get into the general discussion, I'd like to see if there is anybody from NEI who would like to make some comments about the white paper. If there is, can you please raise your hand?

MR. O'NEILL: Hello. This is Marty O'Neill. I'm the Associate General Counsel with NEI and as you know, Marc Nichol, our Senior Director for New Reactors typically represents NEI in these

meetings and unfortunately, Marc is unable to attend today, so I'm just standing in for him.

I think with regard to the white paper, I just note we're still in the process of reviewing it and vetting it internally and with our members, you know, through our Part 53 task force. We really appreciate the overview today, and we'd like to reserve the opportunity to provide some comments at a future date, potentially in writing.

With that said, you know, I'd be happy to pass the mic. There's -- I know USNIC would like to provide some initial feedback. Thank you.

MR. BEALL: Okay. Thank you very much. Next slide, please? Cyril. You're online, please. Please unmute and you can start your comments on the white paper.

MR. DRAFFIN: Okay. Thank you very much. We certainly appreciate what NRC has done in terms of the staff providing information early and providing early language and this draft paper to interested stakeholders. That's a helpful process. I particularly wanted to say that this document was easy to read, a thoughtful 51-pages, helpful summary sections -- and so I think you can go onto the next slide -- that Juan Uribe and Jesse Seymour have done a

good job of providing information both in the paper and the slides today. It's helpful that you augmented it. You know, I think the slide today showed how this effort fits together the piece parts, as you say on slide 11, for the overall Part 53 process and then also talk about implementations. So in general, we thought it was a helpful dialogue to have, and the information provided in the white paper was useful.

What I'd like to do is cover a variety of points, because you did want some response, so over two slides. And I'll also give -- some of them will be just high-level and some will be specific.

On slide 43, the document appropriately refers to the need for reasonable assurance of adequate protection, and we support that. We think that's important to allow in the document. And the white paper recognizes that many of the reactor designs have low risk and, you know, passive features. There'll be modular construction. There's other activities that -- and particularly the inherent features that result in a low radiological safety rise and, therefore, you can change what's currently in the framework. And they offered some suggestions of where that would be appropriate, which we agree with.

We thought it was helpful that they looked

autonomous operations both in the Canadian experience and also in the discussions they had today regarding ideas of how the NRC would view that and allow that. And, you know, some of the efforts that are required to maintain safety but also to use the advancing technology, which is much more sophisticated than has been used, you know, 40-50 years ago.

There's a note that there are some language in Part 52, you know, that deals with some of these aspects but that, of course, could be changed in Part 53, so it doesn't require that. But thinking through the autonomous operations is appropriate. There will probably be some remote opportunities and interests in particularly out in -- you know, kind of in other locations, so that's something I think to consider as we go forward.

There's also recognition of load-following, and I think that's been required by governments or regulatory groups, basically the marketplace in the future -- in the past -- it will be required in the future. And so thinking about that is good and there obviously needs to be some constraints to limit operations that are inappropriate but recognizing what the French are doing and the international experience I think adds to it.

We would suggest that you consider industrial experience. There's some fairly sophisticated petrochemical plants and others that have operations that are autonomous or semi-autonomous, and there may be some experience there and some protocols and some procedures and some training that would be relevant for reactors that are moving from the traditional large size to ones that are autonomous. So there may be other sources of information outside the nuclear industry.

We recognize that the current staffing requirements are fairly prescriptive in nature. The paper recognizes that as well. We do have some questions regarding, you know, why it's -- what restrictive accident dose limits for a plant where licensed operators are not present is necessary; certainly want to maintain safety but it's not clear why it has to be strict environments.

I would point out that there is a number of -- you know -- to allow alternative staffing models is a good thing, and you've talked about that in the discussions today. There's a number of pages which I won't go through right now for time, but in, you know, page 27 where you're kind of thinking out of the box, I think that's good, or looking at different personnel

categories in 32 and considering the -- we would like to also consider not just using licensed operators and so thinking about -- you know, there's a number of positive things that -- and thoughtful things have been included in the paper, so that's positive.

Going on to the next and last slide on this topic, we do have some particular suggestions regarding language or maybe a few concerns. One of the factors is that the refueling outage should remove or redefine because some of the reactor manufacturers have continuous refueling. Let's say the XE-100. So as an example, the current license could -- cold license process states that the cold licensing process is only around until the first refueling outage is complete and afterwards, a hot licensing process must begin. But a refueling outage is not really a concept that some of the operations might have.

And also, there's a question of how alterations will be treated for something like, you know, actually 100 core alts or SRO or SRO limit is required to directly supervise fuel handling requirements. We need a better definition of the term core alts that suits a continuous approach to refueling, and the phrase "directly supervisor" can be a question if it's kind of a continuous operation. So

some clarification on that for refueling design and operations for a number of cases, because there's a lot of different cases. And what level requirements and licensing is required is appropriate.

Looking at the second one on the chart which is covered on page 25 of the report. The term "written" is used to describe the exam. We consider that a -- we consider the possibility of going to electronic or computer-based exams even for license operators. Industry has moved to electronic exams in other parts of industry and the education environment has for non-licensed personnel. But (inaudible), all the license exams currently still require a scantron or a number two pencil, which is not really that current. And so I think electronic exams might align better with the NRC's desire for using technology and modernization activities.

And so I think having an option of written and electronic ones would be appropriate. You've referred to the fact that the scope of those exams might change and the way simulators might be used would change and again, those are worthy discussions to have.

On the STA, we have some concerns. There is -- you've given indication that you're

reconsidering how that could be done and whether it should be done, and that's appropriate. Some of our members don't think the STA position is needed. They do suggest an STA-like training, because you point out some training is required, of course, into the regular licensed operator training so they still have the staff and skills of an STA without actually needing to designate somebody with that particular title. But you do want to have people qualified to do those functions but, you know, it could be other designations of other people.

So I'll pause there but I think is changing -- considering changing the policy is appropriate. And for an SRO, there is some language that they are saying it needs a director, an RO to perform licensing functions that are directed by a senior operator, so can the SROs do it themselves; do they have to direct somebody else. So those are probably detailed comments too much for today.

And cold licensing ought to be required. It doesn't -- really should be addressed as much for advanced reactors, and that's probably something you should -- it be worthy to add.

So let me pause there. We look forward to understanding how the analysis and approaches will be

considered. I think the dialogue today and the charge today were very helpful, and the fact you're thinking about this is important, and it's a good overview of discussion which have been had in some of the other sections. So I conclude (inaudible). I thank you for your efforts and look forward to seeing how you -- this evolves into your proposed regulations and also appropriate guidance that goes with it. Thank you.

MR. BEALL: Okay.

MR. DRAFFIN: And I think that Jeff Merrifield had a follow-up comment, too.

MR. MERRIFIELD: Yes.

MR. BEALL: Thank you, Cyril. Go ahead, Jeff.

MR. MERRIFIELD: Yes. Actually, it's more of a question. In the past, the NRC has been an active participant in the OECD Halden Reactor Project. At Halden, they have a man-machine laboratory known as HAMLAB, which was conducting a simulation and analysis of a variety of simulators both in the nuclear space as well as for oil production platforms, which are obviously quite important in Norway given their offshore oil production. They had looked at a variety of staffing alternatives and ways in which to address control room staffing through that man -- that

human system interface. And I was wondering if you could perhaps explain a little bit more, is that still a program that the NRC is involved with? Have you been able to tap into the insights that they have at Halden in this area? And is that giving you some better understanding of what is the appropriate staffing and how it may be different for advanced reactors than for the traditional reactors, light water reactors we have here in the U.S.? Thanks.

DR. GREEN: Hi. This is Brian Green. I'm the team leader for human factors at NRR. We are aware of the work. We do continue to support the Halden Reactor Project. We are aware of that work, and it has been -- that work has been used to inform some of our existing guidance, you know, such as NUREG-0711 and 0700, 1791. I think those were all informed by some of that. There also are some guidance documents that are directed particularly at small modular reactors, because that was what we were writing at the time, but they had learned some of the lessons from there. So we are aware of that and in tune with that work, and we will be considering that as we continue to push forward.

MR. MERRIFIELD: Thank you

DR. GREEN: Okay.

MR. DRAFFIN: So that was the end of my remarks from the USNIC so obviously, we're interested in any comments that the NRC staff has on them or if other people have comments.

MR. BEALL: Okay. Thanks, Cyril. Next slide, please. Okay. This is the general discussion for this part on the white paper. So Mike Keller, you have your hand up.

MR. KELLER: Yes. This is Mike -- hello?

MR. BEALL: Hi, Mike. We can hear you.

MR. KELLER: Can you guys hear me?

MR. BEALL: Yes, we can.

MR. KELLER: Okay.

MR. BEALL: Go ahead.

MR. KELLER: Yes. Just a general observation, a couple of them actually. You know, these advanced reactors are really just power plants with a passively failsafe reactor generally. They're much simpler to operate than the large conventional nuclear plant, and so we're a little puzzled as to why the NRC appears to want to be heavily involved in the way this thing is in terms of the man-machine interface.

You know, our fear is that the NRC will want to be involved with the layouts on the control --

the CRK; you know, the way we do things now and digitally where we don't really see that there's that much of a need for that because the reactors are passively failsafe. You know, the operator involvement with the safety aspects of the power plant are pretty minimal. So we would expect that the effort to license that should not be that difficult really, you know, and that's our basic fear as to where we see this thing -- you know, the direction it's going in.

Also, as a general observation, because they're -- you know, these things are passively failsafe, you really don't need an STA. You can -- it would be easier just to have somebody on-call and they can always come in, which is what we sometimes do with conventional plants.

And as far as the dispatch is concerned, you know, having run a number of combined-cycle plants, you know, as plant manager, we didn't let the dispatchers control the plant in any case, because we didn't want them running the plant all over the place. So just a few observations.

MR. SEYMOUR: This is Jesse Seymour. You know, I'd like to respond to that, the first point if I could, just to provide some clarification. And, you

know, when we talk about human factors engineering, I just want to clarify what we're thinking about here is definitely not a one-size fits all approach; right? What we're talking about is a scalable, you know, risk-informed approach; right? So, you know, that's the first point I want to make.

And the next point is just that we have to accommodate a very broad spectrum of potential technologies, right, so this could range all the way down from, you know, a micro-reactor that's smaller than some of the existing research and test reactors that we have out there all the way up to, you know, a non-light water reactor facility that has comparable output to the large light waters that are out there. So what we have to be able to do is accommodate a very wide range of potential technologies that we might see. And what we intend to do with our scalable human factors engineering process at this point is to be able to inform that and theoretically have a process by which you could apply, you know, in an informed appropriate way, only as much review as is necessary to reach the necessary conclusion.

So, you know, at the extreme, you know, to your point, it is possible that you could have a very involved human factors engineering review if it was

warranted by the human role and by risk considerations land so forth. But on the low end, you know, if you're talking about a very safe, autonomous facility, you know, potentially there could be very little factors engineering. So we only want to look at what we need to.

So again, what I want to just clarify is that we're not looking at a prescriptive one size fits all approach; right? We're trying to be smart about it and be scalable. And I just wanted to clarify that point.

MR. KELLER: Did you guys envision the common threat on these things, that they're passively failsafe?

MR. SEYMOUR: Well, I can start with that and, you know, again, if --

MR. KELLER: Well, I'm just curious because I mean if you remove that assumption, then yes, I can see where this could get pretty complicated, because you may end up with power plants that have to be actively controlled to keep it safe, you know, ultimately.

MS. VALLIERE: Mr. Keller, maybe if I could just start by saying that we are not making assumptions, that the first step in any application

process for an applicant will be, obviously, to make their safety case. And then once that safety case is made, the results of that safety case, whether it be, as you say, inherently passive safe or some other result will determine how the review of that application (inaudible) will go forward. So I would say we are not making assumptions.

MR. KELLER: Well, no, it's just related to the white paper specifically if that is a basic assumption or not. I mean that -- if you have an advanced reactor that's not passively failsafe, I could see where the licensing could get complicated. And we were under the impression that the intent of 10 CFR 53 was ultimately with the passive failsafe designs. But that may not be a proper assumption on our part. I'm just trying to clarify what direction we're ultimately headed in.

MR. SEYMOUR: So speaking for the -- again, this is Jesse Seymour -- speaking for the contents of the paper, you know, solely within that context, what we --

MR. KELLER: Right.

MR. SEYMOUR: -- are doing is we're trying to accommodate the range of possibilities, right, so, you know, we consider within the paper various

techniques that could be used to apply anything from inherent safety characteristics that's -- and again, we're approaching this in a technology-neutral mindset so, you know, inherent safety characteristics stepping through passive safety features and then looking at, you know, active automatic safety features. And then, you know, potentially even things that are done manually; right? So, you know, with advances in technology, is there a tendency to see things that are behaving more in a passive and inherent way? Yes, but again, we're trying to be broad so that we can accommodate the possible scope of what we might see and then within that scope be able to smartly and in an informed way scale how we approach it. So I'll turn it back over if anyone else wants to comment.

MR. URIBE: No. I was just going to -- this is Juan Uribe. I'm was just going to echo that and perhaps reemphasize the important point that Nan Valliere expressed, and that's the fact that as we're technology-neutral, you know, we need to throw a broad brush, if you will, and make sure that we have the checks and balances in place to make a reasonable assurance of adequate protection determination, and it's really up to that safety case for an individual applicant to be able to demonstrate that they would

meet the criteria. So while I recognize that you're focusing on one particular aspect of inherently failsafe, we're really looking at it from a more broader approach.

MR. KELLER: Well, I -- one last observation was as long as these simpler failsafe designs don't get tangled up in the net, you know, that's fine and, you know, make things more complicated than they really need to be. You know, as long as there's an avenue to avoid that sort of entanglement, then, you know, we're fine with it.

MR. BEALL: Okay. Thank you, Mike. Ed Lyman from the Union of Concerned Scientists, you have your hand up.

DR. LYMAN: Yes. Can you hear me?

MR. BEALL: Yes, we can. Go ahead, Ed.

DR. LYMAN: Great. Yes, thank you. So I have a question and a comment. So my question which, of course, applies more broadly to Part 53, but since it came up so many times in your discussion, you keep talking about low radiological risk as a factor to consider when you're developing these alternative operator requirements. And so my question -- all right, so how do you define low radiological risk, because as we know, this whole rulemaking is being

designed so that there is going to be -- so the licensing of these plants is going to be based on essentially the same radiological risk factors that exist today? So if there is additional safety margin or lower source term of whatever, that may be eaten up by reducing the emergency planning zone, changing assigning requirements, changing the spectrum of licensing basis of events, etcetera, so that you're actually going to have -- you may -- the licensing basis of the plant may result in similar or, you know, the same radiological risk to the public as the operating fleet.

So how are you going to integrate all these different considerations, and where are you going to draw the line, say that there's -- you know, there's no safety margin left to continue to relax requirements in every possible operational area for this plant? I don't see how that's going to happen?

MR. SEYMOUR: So -- this is Jesse Seymour -- so I'll begin and then, you know, I'd like to probably hand off to Bill Reckley for -- or Juan Uribe for a bit more of a, you know, detailed discussion about the Part 53 approach in general. But I will say is this, right, you know, in the paper, we do point towards, you know, the potential for low radiological

risk as being, you know, one consideration, you know, an aspect that would inform our thinking as we go through this. But within the paper, we don't try to set the bar because that's a bit outside of our sandbox, if you will, for this paper.

This paper is, you know, something that, you know, we're trying to form aspects of Part 53, but, you know, our intent is to defer to the broader tiered approach and radiological criteria of Part 53. And the exact way that we mesh up with that is still a work in progress for, you know, what we're doing right now.

So I don't have a firm answer there other than to point to that, you know, we're working to, you know, use low radiological risk as an appropriate input to our thinking and to be consistent with the broader structure of Part 53. And Bill will want -- I'm not sure if there's anything you'd want to clarify as well on the part of Part 53.

MR. URIBE: Well, the only -- yes, the only thing I would add before turning it over to Bill or Nan is that as that aspect also gets more defined in Part 53, remember this is just the first iteration to begin the stakeholders discussion, so I do have a comment written down that perhaps we can take a

section or two in the next iteration to expand upon the discussion on radiological risk and hazards such that it points to Part 53 or whatever the right is, so that it is more clear when you pick up this document what that definition is.

MR. RECKLEY: Yes. This is Bill Reckley. And Ed, you generally have it right that the goal here under Part 53, one of our stated objectives is to make it more clear how you trade off the margins that might be provided by an advanced reactor design against an operating flexibility. And the example you picked of emergency planning is one we use often as well.

And so one way to think about that is to look at emergency planning for the current fleet of large light water reactors and what is the role of emergency planning in ensuring public health and safety. So if a design is able to show that through their design features, through their programmatic controls, as we're talking to -- about right now, possibly through human actions, that they can accomplish the same goal without using the emergency planning provisions, then that's an equivalency and that would be used to do the justification.

So you're right, it ends up being that

advanced reactors will be held generally to the same standard as large light water reactors. How they deliver the standard might be different, more -- and this is the whole goal of the advanced reactor policy statement, that it be done more on the design and less on human actions and potentially less in areas like emergency planning.

So in terms of where the threshold is, it's basically the same. How you deliver it would be what's in play as we do Part 53. And where do we stop? Where the proof is not there that the operating flexibility being sought is being justified by the design features or other programmatic controls that were intended to deliver the same level of safety. So that's my shot at trying to address your question.

DR. LYMAN: Right. But it seems like there may -- you may need to have a hierarchy because not every -- you know, these are not necessarily all interchangeable, you know, aspects of licensing so --

MR. RECKLEY: Well, and a key point, and this is especially important for brand new designs, is the uncertainties and to the degree you add something to address uncertainties, you know. And emergency planning could be one of those things that's added, or additional testing might be needed in order to forego

the need for emergency planning, because you got to get the confidence somewhere; right? So that is the trick and it's not an easy challenge.

DR. LYMAN: Right. And I guess that brings me to my comment, which is I guess I'm frustrated that it seems like the one recent real world example, which is Fukushima, indicated that there should be more attention to human factors, to training, to anticipating unexpected events and planning for them rather than less -- and it seems like this framework, if you don't provide that level of assurance and defense-in-depth, or if you don't have the right uncertainty -- incorporate uncertainties to the right level, you're going in the wrong direction. And then if the plant encounters a situation that's not in the licensing basis, you're not going to have anyone there to be able to execute those emergency actions and prevent a disaster. So it just seems like this is not -- you know, this is walking away from the lessons of Fukushima, and I find that very frustrating. Thank you.

MR. SEYMOUR: Yes, understand. And again, it's not a foregone conclusion on any of these things how it will turn out. And as Juan and Jesse were trying to elaborate within the white paper, the burden

of proof that you don't need a person there to do exactly what you're talking about would be on the applicant to show that the design is such and our confidence in the design is such that you feel -- that we, ultimately, as the regulator, would be convinced that you don't need the backup that's generally provided by having a human there to make decisions. And it's a tall hurdle.

MR. SEYMOUR: Yes. And I would just -- this is Jesse Seymour -- I would just second Bill's point. You know, the comment that was made envisioning the bad day coming and no one being there to address it, you know, no one being there to take actions, that very question has weighed heavily upon our minds as we've navigated this. So that very concern is something that we, you know, involved with filling this paper have been very sensitive to, and we definitely want to make sure that we maintain the right degree of sensitivity towards that.

You know, to Bill's point, we see it as being a possibility but again, there is a high bar to get over. You know, it is possible to get over that bar, but we just see it as being a high bar. And I'll just -- I just wanted to say that.

DR. LYMAN: Great. Thank you.

MR. BEALL: Okay. Thank you, Ed.

MR. URIBE: So can I chime in real quick?

MR. BEALL: Yes, sure. Go ahead.

MR. URIBE: There was a question that I saw that you answered that comments should be submitted to the regulations.gov, correct, because I guess I just want to make sure I didn't mischaracterize anything by including my information on the last slide and telling folks that if they have any comments or questions, they can send it to me and I'll, you know, re-emphasize it. So could you just clarify that one piece, please?

MR. BEALL: Yes. Well, the easiest way to submit a comment on Part 53 is through regulations.gov, and the link is in the comment chat for the Teams. And so that shows you both how to do it on regulations.gov and also how to submit it by email through the rulemaking comment address there, so either way. And if they send it to you, Juan, we can put it in manually so, you know, there are -- so even if they send it to one of the staff members, we can go ahead and dock it under the Part 53 rulemaking and then get it posted into ADAMS and on regulations.gov also. But the easiest and quickest way is also through regulations.gov so no problem there.

So Steve Kraft, you have your hand up. Please unmute and ask your comment.

MR. KRAFT: Yes, thanks. Am I on?

MR. BEALL: Yes, sir, you are.

MR. KRAFT: Oh, thanks. First is a -- two things, but first is a simple question because I'm confused. Going back to the discussion about passively failsafe, on slide 15, third bullet has a partial statement, "Inherent safety characteristics can be considered to be absolutely reliable." Without getting into the degree of reliability in turn, I understand your point about making the case, but isn't that phrase "inherent safety characteristics absolutely" -- isn't that the same thing as passive safety? I'm just curious if that's what you meant.

MR. SEYMOUR: Yes. This is Jesse Seymour, and I -- what I want to do real quick, this is a level of detail that wasn't put into the PowerPoint but the paper itself does talk about it. And what I want to do is, you know, if you just bear with me for a minute, I just want read an excerpt from 2020 report that Sandia National Lab did in which they, in part, they addressed these concepts of inherent safety characteristics and, you know, the absolute nature of inherent safety characteristics. And I think it's

informative because it helps to, you know, kind of draw that line between, you know, what we should be thinking of when we think of "inherent" and what we should be thinking of in terms of "passive."

So what they said was that the classification of absolute reliability must be qualified by a detailed consideration of the range of characteristics of the SSC to support safety function. For example, controlled reactivity often involves reactivity feedback mechanisms inherent to a system preventing reactivity excursions from occurring; right? The example they used, you know, the specific example, in moderator temperature feedback being (inaudible). In that case, it is generally difficult to postulate an external perturbation that would give rise to loss of reactivity control. However, for cooling or containment functions, it is more likely that passive systems can exhibit failures under a range of external perturbations such as they are not absolutely reliable; right? And again, you can imagine you're relying on driving (inaudible) and so forth for, you know, some of those natural convection flows. Under some circumstances, however, even cooling functions may be ultimately reliable should the power level of the reactor be sufficiently low for

residual heat to always be rejected to the atmosphere.

So again -- and that's on page 10 of the white paper in a footnote. We tried to elaborate a bit more on what we're thinking there. But, you know, the line of demarcation between what is inherent and what is passive is -- it's a tough issue. It's an issue that, you know, we address in more depth in the paper. We reference back to some IAEA attempts that have been made to truly define inherent safety characteristics. But, you know, I think one thing we tried to acknowledge in the paper is that, you know, it is somewhat controversial with regards to, you know, what the true definition of an inherent safety characteristic is and where the break point is between inherent and passive. And I'm not sure if there is anyone else that wanted to chime in on that as well.

DR. DESAULNIERS: Jesse, Dave Desaulniers here, member of NRC staff, senior technical advisor for human factors. I did want to take a moment there because I think this is an important point where we often here in discussions those terms used interchangeably. And while there's perhaps not an accepted demarcation, as Jesse pointed out, I think from our view, there is an important distinction there in terms of the implications, potential for human

action. And, you know, generally, when we're talking about inherent characteristics, we're thinking that, you know, again, that these are going to be based on physics, and as I would like to sometimes say, require almost a loss of gravity type accident for them to be able to fail.

And passive systems, though, will require some engineering that are vulnerable to possibilities such as misaligned systems and, therefore, they do have greater implications for operator action.

So we need to think about these concepts separately to gain alignment on what -- you know, how we're going to use these terms such that the implications for operator action can be appropriately considered in designs and reviews.

MR. KRAFT: Well, thanks, Ed. Appreciate these clarifications, specifically that definition that you provided. My second point is in response to Ed Lyman's statement about Fukushima.

Ed, I completely agree with your point about the need to really look at union performance. No question. I was at NEI for all those years. We looked at that ourselves. But in a broader sense, it's not really -- Fukushima isn't really a good comparison.

That accident occurred because things failed at so many levels, beginning with their central government not having a strong regulator, the relationship between the regulator and TEPCO, TEPCO -- I hope my TEPCO friends are not going to shoot me for this, but frankly, ignoring the latest tsunami science, all the way through all those other issues.

And, frankly, the -- and it was a large BWR technology. As I understand this process, it's that NRC is beginning with the technology. Frankly, they're beginning with themselves. NRC is a very strong regulator who, frankly, doesn't take any crap from the industry. I've been through it for decades. And while I have a lot of friends at NRC, I have a huge amount of respect for the Agency.

Having said that, you start with the technology, and it's pretty clear you're doing that. So I think in the long run that it works out in the system; it'll be okay. And then the last thing is -- I have probably said at these meetings before -- I completely agree with you that when you're dealing with the technology, it is the uncertainty.

If you go back to what you used to call -- you called the bow-tie diagram in one of your earlier meetings, that sort of explains it right there in

terms of -- of how all these bits fit together in new technology. And I think it's something that everyone -- industry, NRC, everyone -- has to work their way through, the same way we worked our way through it with the current plan.

Anyway, that was just really a statement, not a question. Thanks very much.

MR. BEALL: Okay. Thank you, Steve.

I don't see any more hands raised. So can we go to the next slide?

Okay. So this part is topic 2, the second iterations of the previously released preliminary rule language for Subpart B.

So, Bill, if you can kick us off for this.

MR. RECKLEY: Okay. Thanks, Bob.

If we can go to 47, first of all, I hope everyone appreciates that what we're trying to do here is a bit of a novel approach in the way we're constructing this basically in public through this iterative process. It's a challenge to us. I appreciate that it's also a challenge for all the stakeholders because you're seeing bits and pieces before the whole puzzle was put together.

We have, as the second bullet points out, received numerous comments from external stakeholders.

And just to kind of emphasize the novel nature of this, we're also continuing to do assessments ourselves. And so when we were putting out the first iteration of the text, that was a working group product. There were some things in there that we knew from the beginning were going to be a challenge, but we needed to get things out to support discussion.

So we do appreciate people's patience as we go through these iterations. We have developed some internal processes, different levels of management, Office of General Counsel participation and so forth, to help us along in these iterations, as Andrea mentioned in the opening.

And if you go back to our slide, we recognized that we'll be talking about this for the rest of the year, and in no small part because as we develop the subparts like operations, we're going to have to go back and see how that fits in with the design sections, with the construction section, and so forth.

And then, lastly, I would just ask people to keep in mind that what we're developing right now is preliminary language that will ultimately feed a mission paper with proposed rule, draft proposed rule. And that process, through the rulemaking procedures,

includes continuous opportunity for people to provide their insights.

And even as we send up the paper, we can identify to the Commission what are some of the bigger issues, and even at the proposed rule stage, we can identify those and solicit additional comments all through this process. So we're not at the -- we're nowhere near the end of this process, and just kind of reinforcing the fact that there'll be a lot of opportunities for interactions as we go forward.

So if we can go on to 48, when we were having an interaction with the Advisory Committee on Reactor Safeguards, ACRS, we used this slide, and maybe it would be useful here as well. We do understand that there's been some communication challenges as we've tried to do this.

Part of that is because some of us have been involved in what we see as the evolution of where we are now in Part 53, going back decades, and seeing it basically evolve through the first pre-application reviews of PRISM and SAFER and MHTGR back in the '80s and '90s after the release of the Advanced Reactor Policy Statement through the development of New Reg 1860 and, at that point, the really combining of risk-informed approaches and advanced reactors, then

through next-generation nuclear plant up to the current time.

And so maybe we didn't give enough time to communicating how we saw this as that evolution. But, again, this slide we used for the ACRS, and I think they found it useful, so we're using it here today basically just to go over the subparts that we'll be talking about in a minute.

The comparison of 50 and 52 to what we're proposing under 53 just may be helpful, especially for those that are well rooted in parts 50 and 52. As has been mentioned a number of times, basically, the safety criteria is the same. And we'll talk going forward about citing criteria, the footnotes in 50 and 52, assuming the 25 rem for a major accident.

The other safety criteria that's used process-wise in Part 50 in areas like backfit assessments, regulatory analysis, reactor oversight, kind of behind the scenes a little bit, and used in Part 52, specifically in Chapter 19 of our standard review plan, we do look at the QHOs. But as has been pointed out through comments, that's through guidance under Part 50, whereas, as we'll talk about later, we're proposing to incorporate it specifically into the rule.

In the design and analysis area, in Part 50 and 52, you have a prescriptive and generally highly conservative analysis that's done for the design-basis accident. And this history of why it's done that way goes all the way back to basically 1960 with the identification of the large break loss coolant accident as the maximum credible accident.

And, in part, the conservatism there addresses the reason in the licensing and the safety case that other events weren't looked at. And back in that time frame, those were the Class 9 accidents, and they were particularly excluded in part because the DBAs were done in such a conservative manner.

In Part 53 and -- we're taking a more structured, and to some degree less conservative, approach to the DBA, the design-basis accident. And that is enabled because beyond-design-basis events, in the next bullet, are not only analyzed but there are regulatory controls specifically put in place to address those sequences.

And in Part 50, basically, additional things were added in areas like station blackout and anticipated transient without scram based on operating experience or studies, but it was more of an ad-hoc basis to address particular beyond-design-basis events

as opposed to a systematic assessment within our regulations.

And then, lastly, I mentioned Part 50. Then that would be more of an ad-hoc for things like augmented quality for station blackout equipment when that rule is passed. A little more structure as risk-informed approaches were introduced in Part 50 through regulations such as 50.69.

But, again, under Part 53, our proposal is that there will be specific regulatory requirements for special treatment of non-safety-related but risk-significant SSCs. So just a little bit of background and things that we were considering as we developed Part 53 and a caution against comparing 50 and 52 against some of the proposals in 53, because you've got to be very careful how you pick and choose what you're going to compare in that exercise because, again, both are fairly well established integrated programs, but they're put together slightly differently.

So, kind of the way Ed was mentioning earlier, they might be the same puzzle, but the pieces are cut to different shapes and they're put together differently. So if you're going to pull out one puzzle piece from the two puzzles, they may not be the

same because they basically are going to be designed to fit together somewhat differently within the integrated package, whether you're talking about Part 50 and 52 or you're talking about how we're proposing to do it under Part 53.

So if we can go on, then, to slide 49, and again, this is really trying to say what we were thinking when we put out the first iteration, but much of it remains accurate now, as we'll get into what we've released in terms of the second iteration.

So the first-tier safety criteria was kind of established with the thought that we would set up a minimally acceptable level of safety through the first tier. And this gets to be a difficult communication challenge because people will then look at it and say, well, if that's minimally acceptable and you're the regulator, you don't need to go any further than that.

But my analogy is, if you want to look at how the licensing and regulation of the operating fleet progressed over the years, this would be comparable to somebody under the ROP being in the red category. All right? It's minimally acceptable. You can stay there for a short period of time, but this is not where you want to be as a licensee, certainly not where we want you to be as a regulator, and therefore,

there are things you need to do to address because you're only addressing what is a minimal level, and corrective actions need to be taken.

So that would be one. You've got to be careful with analogies in the ROP and the operating fleet and so forth, but another way to look at it is this would be only the level of safety -- and we'll talk about this because this is actually how this is constructed. This is only the minimal level of safety provided by tech specs, which means if you satisfy this, you may not need to shut down.

But, again, just like the ROP red, it's not the normal state, and it's not the level of safety that would be expected for long-term continuous operation. That's basically true of the operating fleet and in terms of how this is set up, and we think we maintain the same concept under the proposal in Part 53, but acknowledge, again, the puzzle pieces are cut to different shapes. So it might look a little different.

The construct to Part 53 as we have it laid out, and this is just reflected here, is the safety criteria are set at the higher level, the highest level, and then they're met by satisfying the safety functions. And then the safety functions are

met by defining or putting in place the appropriate design features, the hardware, the appropriate staffing that we just talked about, and the appropriate programmatic controls to make sure that the equipment and the staffing works when called upon.

So safety -- in terms of the hardware, safety criteria, safety functions, design features, and then, as we'll talk about when we get into Subpart C, functional design criteria. So that's basically the construct through these first few bullets.

The one thing that was kept under Part 53 was that the demonstration of the first tier would be supported by a deterministic design-basis accident, albeit, as I mentioned on the previous slide, similar to a DBA for the existing fleet, but also, there are some differences in terms of the level of conservatisms, the range of events it's meant to cover, and so forth.

This first tier also provides the basis for defining the design-basis external hazard levels for the safety-related equipment, and it provides a basis for the content and technical specifications that we'll talk about in May when we get into the operating Subpart F.

We talked about here today there may be a

distinction. This is one of the areas we want to talk about. There maybe a distinction when we talk about staffing and operator licensing between those things needed for the DBA and those things that may be needed for beyond-design-basis events.

And that's, again -- you can draw the corollary to the operating fleet if you want, the difference between established operating procedures at a plant and when we drift over to things like accident management guidelines that have a different regulatory standing.

And in terms of the applications, this first tier, if things are needed for this first tier, they're going to get the greatest level of detail in terms of the information and the licensing documents. So if we go to slide 50 for the second tier, basically a similar construct, but again, in terms of the overall safety of the plant, when combined with the first tier, the additional things like special treatment of equipment ensures an appropriate level of safety for long-term risk-informed operations.

So that is a concept, and I think we'll probably end up talking about that a good bit as we open it up for discussion because this is -- I think it's key to some of the comments that we received.

And I'll leave it there and open it up for discussions later.

It's likewise met by a defining of what safety functions you need to satisfy the safety criteria associated with the second tier. It's a systematic analysis. We, in the first iteration, talked about probabilistic risk assessment as being the tool. I mentioned it provides the basis for identifying other risk-informed requirements and special treatment.

One of the things that it also does is this is the primary way that you enable the risk management approach to operations because you're going to put the most stringent regulatory controls on the first tier, for example, tech specs.

And for the bulk of equipment, given advanced reactors are expected to have fewer safety-related systems and therefore fewer things to be addressed in tech specs, you have more operating flexibility in a risk management approach, something comparable to maintenance rule kind of controls over activities that give more flexibility to the operator in terms of maintaining those systems, taking corrective actions when needed, and so forth.

But that would largely be through licensee

programs required by regulations, but afforded more flexibility than, for example, a tech spec control. And it enables us to make a distinction between the level of detail in terms of the information in an application.

So for the second tier, we would envision more of a risk-informed, function-oriented, performance-based approaches to the content applications as opposed to more detailed discussions at the system component level, as would be provided for safety-related equipment. So if we can go to 51, we'll start to get into the feedback and our development of the second iteration.

So some of the feedback -- and most of you are aware if you've been attending the meetings or seeing the correspondence, the first tier -- we really didn't get many observations or comments on the actual safety criteria used for the first tier. But that's the traditional 25 rem and exclusionary boundary.

But we want to acknowledge the difficulty in communicating the attempt that we made in the first iteration to really bring in the language from the Atomic Energy Act and align both the first and second tier to the language of Sections 182 and 161 of the Act in terms of adequate protection in the first tier

and minimize danger in the second tier.

We knew that was a challenge when we developed the first iteration. There was, to be honest, an amount of internal skepticism about doing that. But we gave it a shot, and what happened was that we learned that that probably is not a feasible approach, that adequate protection as it's been traditionally used -- and largely, there's a desire to keep it this way -- is not necessarily amenable to defining it to a specific technical standard like the 25 rem number.

So we reworded the objectives, again, the highest level within Subpart B, to adopt something other than the adequate protection language from the Atomic Energy Act. And so if we go on to 52, you can see the wording. Most of you have probably looked at this.

But what we've adopted is that for -- and this will generally align with the two tiers and probably aligns better with the two tiers than did the Atomic Energy Act language, which is that the first objective is to limit the possibility of an immediate threat to public health and safety.

And then the second change was, instead of taking the language from the Act, additional measures

to protect public health and minimize danger to life or property, we replaced it with the language of, may be appropriate when considering potential risks to public health and safety.

So that is the language. I imagine when we get into the discussions, we can go maybe have some question and answers in regards to this. But the bottom line is that the effort to do that alignment was going to be a challenge in terms of the Atomic Energy Act language, and comments from both external and internal pointed that out. And, therefore, we will basically acknowledge that that was maybe not the best of ideas.

So we can then go on to slide 53. So the other thing that we did in the second iteration was to consider comments. Again, we did receive comments that it was unclear why we needed two tiers. Going back to the slides that we gave to the ARCS and I repeated here today, hopefully that's a little more clear as to why we think it's appropriate to have two tiers.

And as we get into the discussions later this morning and this afternoon -- oh, it's 12:00. But as we get into the discussions this afternoon, maybe we'll get into it a little more as to the -- why

we think it's important to have a two-tiered structure in terms of being able to differentiate between the classification of equipment, the treatment of equipment, the developing the content and technical specifications, and so forth.

So, having decided to maintain the two tiers, we looked at the criteria. And, again, kind of the nice thing about the objectives that we picked were, especially on the first tier, we think it's reasonable to use the same safety criteria, which is, again, more normal ops, the Subpart D of Part 20, basically the 100-milligram-a-year number.

And I know there's additional discussion about having that there, but we'll talk about that again this afternoon. Focusing more on the unplanned events, there seemed to be a general agreement that the 25 rem at the exclusionary boundary was okay. And it does provide a reasonable number to align with an immediate threat to public health and safety.

I know people might argue there's a higher number that one might use, but we added a footnote to basically explain don't try to overread the 25 rem in either direction, either as it's an acceptable dose to the public or that it's necessarily a life-threatening dose. But at 25 rem, it's very possible that your

body is going to have some indication that you got a dose that large. So it's not an unreasonable number to use in terms of immediate threat to public health.

And the only change, then, that we made was that since we separated or dropped any discussion of an alignment of the criteria to adequate protection, we were able to delete Item C that we had included in the first iteration, which basically gave the Commission the ability to add criteria as they see fit.

But, again, that's -- the Commission will maintain that. When we get into Subparts H and I, the backfit determinations and so forth, the Commission will still have that ability, of course. But we don't need to include it here because we're no longer specifically aligning the criteria to the adequate protection standard.

So if we can go on to slide 54. Oh, okay.

Bob, what do you want to do?

MR. BEALL: Where we are, right now, is that -- Bill, do you have any other -- we have 15 minutes before we break, or -- we can do, right now, is, I think, the staff had some more comments, or some more information to provide on the White Paper.

This could be a good time to go back and

do that. So, Jesse, do you want to talk about some of the things on the White Paper, specifically, the comments from the U.S. Nuclear Industry Council?

MR. SEYMOUR: Yes, and I appreciate the time. I just wanted to loop back around and touch upon a few of the comments, hopefully, just to provide some more clarification and, you know, just to expound a bit upon some of the items that are put in the paper.

And there's two specific items I wanted to touch upon. One, I think, there was a comment, regarding, you know, potentially applying a more prescriptive, you know, accident dose criteria for facilities that didn't want to use licensed operators, at all.

And I wanted to clarify is that, you know, as we were going through this presentation, today, I did outline, you know, a number of, you know, potential prescriptive criteria that we could use to, you know, to help make that determination about, whether or not, you know, it would be acceptable to, to not have licensed operators for our facility.

But something that's outlined in the Paper is, is once, once we've discussed that, then what we do is we, you know, kind of, digress, a little bit,

and we talk about some potential variations and alternatives to those criteria.

You know, again, just, you know, this is really, you know, a, I think, meant to be a conversation starter, you know, when you get to this part of the paper.

And we threw out some of the, you know, other thoughts that we had on how, you know, it may be good to, or, you know, not appropriate to approach this.

And one of the potential alternatives that's listed in that list is, you know, setting a more strict accident dose limit for plants, where licensed operators are not present.

You know, some of the other, you know, items that are included there, you know, we -- you know, but we, also, speculated that, you know, you know, perhaps, you know, there could be a criteria, you know, that required that the reactor, in question, be graded below a certain thermal power, you know, for that to be acceptable, or, you know, only allowing autonomous facility operations during, you know, certain modes of operation.

But, again, you know, these weren't the primary criteria that were discussed, they were just,

you know, various alternatives that we, you know, again, we had discussed them, during the course of developing the other, the other more prescriptive criteria and, you know, we just wanted to share our thoughts, you know, just, you know, what could be thoughts about the potential merits, or, you know, why, you know, those won't be appropriate to consider.

So that's the first, you know, thing that I wanted to, you know, clarify upon it. And, again, that's on Page 42, of the Paper, where, you know, where we talk about that.

Now, further along, I, I think, there had been a comment, as well, about there being concerns about, you know, the STA potentially not being needed, for these Advanced Reactors.

And, again, it's something that we, we do discuss, going through the paper, you know, it's a concern that we are, we are definitely sensitive to and, I, I think, multiple commenters brought that up.

And what I want to do is, again, you know, for the sake of time, I didn't go into this level of depth and size, but on Page 46, of the Paper, we do talk a little bit more about our thought process, here.

And, again, just to, kind of, go through

this. You know, what we say in the Paper is that, you know, there isn't a well-defined process for applicants to propose the elimination of the STA position, currently.

And again, recall that, you know, with other issues where we're talking about, you know, exemption from existing regulations for, you know, applications that are being received, now.

But, in this case, you know, the STA is rooted in Commission policy statements that have been issued, over time. So, you know, what -- what -- the situation that currently puts us into is, is having to treat that, as a policy, you know, matter when, when that's received.

So it's a bit different of a mechanism, because it requires Commission interaction, when we, when we do that. And that's not to say that, it's not, it's not possible, right, but we don't have a, you know, well-defined process.

Now, what I do outline, in the Paper, is, you know, we -- there are certain factors that, you know, we feel that, considered an aggregate, could potentially support a proposal for STA elimination.

So similar to how we discuss, you know, prescriptive criteria, you know, if we're not having

licensed operators, here, we also, you know, discuss some potential factors that, that might be informative to making that decision, about whether, you know, the STA can be eliminated, for a given facility.

And, again, you know, I want to preface this, by saying that, you know, this is, this is, you know, preliminary and, you know, we're talking about, you know, something that's in draft here, but, you know, the factors, and there's five, right?

One, you know, consideration of the specific licensed operator qualifications and training, right? So when we think about, you know, the training that's received and licensed operator, you know, initial training and so forth, you know, there's, you know, training that's done on generic fundamentals, right, thermal dynamics is part of that, you know, certain engineering considerations for the plants, you know, mitigating core damage, right?

These are topics that, in modern licensed operators training programs are, you know, you know, expected to be embedded in those programs, right?

So one thing would be consideration of, you know, what, what is the scope of the training of the other operative? You're getting, with an eye towards, you know, what was the type of skill that was

originally envisioned by the STAs that will be bringing into the control room?

(Off the record comments.)

MR. SEYMOUR: Next.

(Off the record comments.)

MR. SEYMOUR: Next, would be Control Room Human System Interfaces. So again, looking back to, you know, the original Commission Policy statement that was made, regarding STAs, there was discussion of, you know, you know, the states and, you know, evolution of, of, that was foreseen for Human-System interfaces.

So this Human-System interface has become, you know, I think, better-suited to help people navigate the complexities of an accident, right?

And we think about things, you know, in regards to the safety parameter, displays and, you know, computer-based procedures and so on and so forth, you know, helping to make sure that people are recognizing degradation and safety features.

And, also, making appropriate transitions, as they, they move through, you know, their mitigating procedures to try to address events and, also, be able to recognize when those, you know, when those mitigated strategies are breaking down and not

working, right, as, you know, the systems get better at facilitating that. That's another consideration.

Design features, right, you know, we talked about, you know, the potential implications of, you know, having, you know, inherent safety characteristics and passive, you know, safety features, right, and, and what that can do to shape our thinking.

You know, the fourth item is a limited reliance on human actions for safety, right? So, you know, again, as human actions aren't required for safety, we may find that, you know, potentially, you know, there's, you know, more opportunity for the staff that are there, to put more attention into, you know, various aspects of operation in a well of workloads and, and so forth and, perhaps, have more forgiving time frames to be able to consider what's going on around them.

And then, lastly, you know, the final item was Automated Capabilities. That's apply additional defense and depth and reduce crew workload, and, and that, kind of, blends in, I think, with the, the former item there.

You know, again, just, you know, you know, improving that, you know, span of attention that's

available for folks, reducing our level of stress in an emergency, potentially.

And then, also, you know, giving them, you know, the greater, the greater resources to address what's going on around them, in the absence of having that extra body in the control room.

So -- so yes -- so I just wanted to point those out and, you know, I guess, maybe, just turn it over and see if there's additional questions? I think -- I think, there's a hand up. Oh, I, I do see it. I think someone wants to chime in. Is that you, Juan?

MR. URIBE: Yes, Jesse, thanks. I just wanted to perhaps address another one of the, the comments, by Mr. Draffin, and, and I guess, it wasn't, perhaps, intuitively obvious, so I, I do apologize, if this is a response that you were already aware of.

But, one of the things that, the comments was to, perhaps, look at the other sectors, like the petrol chemical plants to, to gather and glean insights into the Human, HFU reviews and Human-System interface.

And so one of the things I just wanted to emphasize is, while we can definitely take a look at that, but one of the reports that we reference, in the White Paper that Jesse alluded to, is the Sandia

Report. I think, it's first referenced, on Page 8.

And, in that report, one of the, one of the things that they look at is, they look at the interaction with other industries, such as the wind, solar, space, marine, and ground transportation.

And we did glean HFE-related insights, from those other segments. So I just wanted to offer that that, it's incorporated, by reference, to some extent, but it was a good comment to continue to look at other areas.

MR. BEALL: Okay. Thank you, Jesse and Juan. Jeffrey Merrifield, you have your hand up.

MR. MERRIFIELD: Yes. Thank you. Thank you, very much, for, for calling me. I just -- this is a very helpful further explanation of the staff's intent on the White Paper and, certainly, appreciate the openness and willingness to be considerate of different thoughts and objectives.

The one -- I think, the one helpful comment, you talked about how things like the STA are driven by, by Commission policy. And I do think, you know, that, that particular policy decision was established by a set of facts that were in front of the Commission, at that time.

And so as you work your way -- and this

is, I think, consistent with the rest of the effort on Part 53, is we work our way through establishing, what's the right level of regulation?

I think, certainly, where there are Commission policy statements that might not, might not make sense, in light of the technologies being evaluated, certainly, raising those, in a prompt way, to allow the Commission, who are appropriate, to potentially remove that impediment and, and change policy, which is, the Commission, certainly, is very capable of doing, in order to more appropriately align the level of regulation, with the, with the technologies that are involved. Thank you.

MR. BEALL: Okay, thank you, Jeff. Also, just for everybody's information, Jesse has put a link into the Teams chat window, with the, to the paper on Human Considerations for Automating Micro Reactors. So you can go there and get the Adams Number for that. Mike Keller, you have your hand up.

MR. KELLER: Yes, this is Mike.

MR. BEALL: Yes, we can hear you, Mike.

MR. KELLER: Yes, this is Mike Keller. You guys might want to take a look at how things are set up and combined cycle power plants, where the, where the main (inaudible) interfaces are really

well-done.

And a lot of that is, because you might have two guys on shift, for a 1,000-megawatt power plant, so they have to be able to quickly ascertain what's going on.

But the real point is, there is a huge amount of effort that's gone into those things. And, I think, you would -- that that is the model that would be more appropriate for a reactor power plants, honestly. I mean, you know. But, anyway, just an observation. You guys might want to take a look at some of those things. Thank you.

MR. SEYMOUR: And this --

MR. BEALL: Okay.

MR. SEYMOUR: -- is Jesse, and I just wanted to say, I, I do appreciate that feedback and, you know, I've made a note on, you know, it's just a data point, for us to keep in mind, so thank you.

MR. BEALL: Okay. Thank you, Mike. I don't see any more hands up, so this is the -- this is -- we're right on schedule, for taking a break. So we'll take a lunch break, right now, and we will reconvene this public meeting, at 1:00 p.m.

And, we'll continue on with discussions on the second iterations of the preliminary rule

language, for Subpart B, after lunch. So we will start this meeting again, at 1:00 p.m. Thank you very much.

(Whereupon, the foregoing matter went off the record at 12:17 p.m. and resumed at 1:00 p.m.)

MR. BEALL: Good afternoon, everyone. I'd like to welcome, everybody, back to the second half of our public meeting on the Part 53 Rulemaking.

So, we will continue on with discussions of the Subpart B, second iteration, and preliminary proposed rule language. With that, Bill Reckley will continue walking us through the staff's slides. Bill.

MR. RECKLEY: Okay. Thanks, Bob. Yes, I'll try to get through these relatively quick, so we have some, plenty of time for discussion.

We can go to -- yes, there we go, 55. Really talking about the, the second tier safety criteria, there were, there were a couple of topics over the next couple of slides.

One of which, was the consideration of, as low as, reasonably achievable, under the normal ops provisions of the second tier. And, a number of proposals to not consider ALARA within the regulations.

Our iteration, as you've seen, in the

discussion table, was to keep ALARA -- really -- I mean, the ALARA provisions apply to every license the NRC issues, be it source, byproducts, special nuclear material.

And, you know, if we're going to cut out a subset of licensees, for advance reactors, to say, this provision doesn't apply, we would need some very special rationale and, and we have not heard it in the discussions.

That said, we're trying to read between the lines, about what is the concern with ALARA and would acknowledge that, there have been issues in reactor licensing associated with the consideration of ALARA in the process of doing design certification, or specific licenses.

And -- and so what we're pointing to, in the discussion table, and I repeated in this slide, is that, to the degree that is the concern, we looked at the potential for guidance, to try to address that issue.

And, in specific point to the Advanced Reactor Content of Application Project, or ARCAP, and the last draft that was put out, for Chapter 9, which would go to the normal radiation protection and waste system, kind of, reviews that we do.

And the language that's reflected, in that current draft, which tries to steer applicants and the NRC staff, to a more performance-based approach, where the reliance on design information is scaled back and the integration of the design and performance metrics, during operation, is emphasized.

So again, when we get to the discussions, we can open that up and see if that kind of scratches, at least, part of the itch that people were trying to, maybe, address within a broader proposal, just to remove ALARA from the regulations.

So if we go to 56, the other element of the second tier that got quite a few comments and a range of comments, from accepting it, to proposing not to use it, at all, to some proposals to take out the numerical values and, and try to just represent it in some kind of text language, was the use of the quantitative health objectives, within the second tier.

And -- and, again, our reiteration is to maintain those. And we'll get into this, a little bit, after we get through Subpart B, and start to talk about Subpart C.

But -- and it goes to the integration of, of these various activities and, and the request,

really, for people to think through, if not this, then what would you use and how would we address some issues?

And I'll give you an example -- I can give you an example, here, why we think we need a risk-informed metric, within the second tier. The -- when we get to Subpart C, we didn't get comments.

And, maybe, it -- maybe, it was subtle and didn't get much notice, but built in to Subpart C, and then supported, when we get to Subpart F, on operations and maintaining the reliability largely of the non-safety-related equipment that warrants special treatment.

That whole construct, as it was described in SECY-19-117, was part of the rationale for providing an alternative to the single failure criteria in the design.

And so we have maintained that, from that SECY Paper, and tried to build in place, in Part 53, the rationale for not requiring single-failure criteria in the design.

So if you're going to do that and establish reliability measures, which is a key part of that rationale, then you need a metric, and the QHOs are, basically, an established metric for that.

So that is, you know, that's part of our rationale and, when we get into the discussion on Subpart C, maybe, we can revisit some of the discussion, for example, on single-failure criteria and, and how we're trying to, to basically build that into this construct, as an option.

The other part that we can talk about, when we get into, either, the discussion on Subpart B, or maybe, more likely, the discussion on Subpart C, is that subset of Advanced Reactors that want to maintain Part 50 approach, be it, you want to call it Part 50, or you want to call it IAEA, Specific Safety Requirement 2/1, they're basically the same.

And, if we wanted to do that, or if a subset of Advanced Reactors want to do that, that's fine, that' a -- that's an integrated approach and alternative philosophy and maybe we can talk about how to accommodate that.

And, maybe, it's better to accommodate it in Part 50, as opposed to trying to make Part 53 convoluted, by trying to address two significantly different design approaches.

They get you to the same place, but it's very hard to craft the rule that would allow that deterministic barrier-based approached that's

reflected in Part 50 and in IAEA SSR-2/1, and reconcile it with a licensing modernization process, a model more like LMP that, that approaches the problem slightly, in a slightly different direction.

It gets you to the same place, largely, in terms of, net safety to public health, but, but they're different philosophies. And the struggle the staff is having is trying to make Part 53 a vehicle for any approach anybody wants to take.

The Part 50 approach exists. It's there. It's well-established. It's reflected in the IAEA standard and, maybe, as part of the framework, we don't try to jam it all into Part 53, we only need to develop a framework.

The Congress didn't tell us we had to put it in all one part of our regulation. So we'll get to that, when we get to Subpart C. But, in the short-term, the reason, or one of the key reasons we keep the QHOs is, because we need a risk metric, in order to tie all these pieces together and get to the operational flexibilities we want to have, when we get to Subpart F.

If we want to go on, then, people have seen the table, on Slide 57, if you can? Yes, this just gives the wording. Again, we didn't do a

comparison, here.

We did take out the language, from the Appendix I, to Part 50. That had been inserted, just, kind of, as a placeholder and was a distraction.

So we just -- we have knowledge we need to come up with some discussion of the normal operations, under the second tier, the lowest reasonably achievable, that might be just a reference to Part 20.

Designers do need to recognize that the NRC's not the only regulatory body in play. You still, also, need to consider Part 190, to Title 40, the EPA regulations. And that's reflected in Part 20, so we could probably do it just by reference.

But -- but -- so -- so that was really the only change. And we did keep the QHOs. It's just some editorial changes to the language, under Item 2.

If we could, go on to 58. The next discussion, in preparing this second iteration, there was some discussion on safety functions, and some proposal to go to a more definitive list of safety functions.

Be it, however you want to characterize it, the typical fundamental safety functions of reactivity, or power control, heat removal and retention, or containment. We also note, here, there

were even individuals and members of the SRS that that liked that structured approach.

In our reiteration, we maintained the requirement that, actually, the designer, or applicant, defines the required safety functions. You have the primary safety function, which is the retention of radionuclides.

But then, after that, the rules remain that the designer needs to identify other safety functions needed to support the primary. And part of the reason for that is, this rule and the assessments that are done, under Subpart C, are to look at every significant inventory, at the plant.

And, whereas the fundamental safety functions, or the, the three Cs, the control and cool and contain, are traditional for the reactor system, there may be different safety functions for something like a waste system that, that for some advanced reactor designs, could have as much inventory, as the fuel system, and the safety functions, for those inventories, may be different.

For example, they may not need reactivity control, depending on which radionuclides are in the waste stream. So we kept it. We don't think that's a big deal, insofar as, we give the examples of the

traditional, fundamental safety functions.

The other note is, we have told the Commission that we're going to try to keep Part 53 open, to even address fusion energy systems, should they decide to treat those, as utilization facilities, so -- and, and, obviously, a fusion system would have different safety functions, than a, than a vision-based system.

So if we could, go on, then, to 59? Occupational dose, again, a fair number of comments, as to whether it was, needed to be there, and a more general comment that, as opposed to paraphrasing, or repeating language to, to point to Part 20, so we did revise to point to Part 20.

The note here, just, if you're interested, and this goes back to somewhat to the, to the ALARA observation that, as low, as reasonably achievable, is not just an NRC construct, it's reflected in EPA guidance and, obviously, it's reflected in IAEA and other requirements from other regulators.

So then -- so if we go on, then, to the next slide, it just shows the change. And, again, we -- the primary change was just to change the language, to point to Part 20, as opposed to paraphrasing.

Then, if we go on to Slide 61, this was

another area, where we got a diverse set of comments. But the ones we want to address, I guess, are the ones that, primarily, said we didn't need to include defense and depth, it should be kept, as a philosophy and not as a regulatory requirement.

And, in any regard, if we do keep it, it was too prescriptive and that, primarily, went to the last sentence, in the section that, basically, lays out that no single feature wasn't, should be exclusively relied upon.

So what we did with those comments are reflected in this second iteration language, on Slide 62, we made some changes. We kept it -- there's some editorial changes, within the paragraph, but, primarily, it was maintained very close to what it was on the first iteration.

The capture of defense and depth, within the regulations, in our view, is -- it's really needed, because we're trying to develop a technology-inclusive approach and you need to be able to define what the major considerations are, in a fairly generic manner.

And so defense and depth, as a philosophy, is one of those key areas. And, I think, most people, acknowledge that it, that it has always been part of

the philosophy.

It's not in Part 50, as a specific requirement, but in our view, it, it is entwined within the prescriptive requirements, in Part 50. So to say Part 50 doesn't require defense and depth is not, not an accurate statement.

You can look at the general design criteria, you can look at the ASME code that we incorporate, by reference, any, any number of areas you can look and you'll see that the specific requirements in Part 50 are, in many cases, specifically there to provide defense and depth, so yes, there's no single requirement, because the philosophy was used to develop the prescriptive individual requirements.

In the absence of the prescriptive individual requirements, be it, in the general design criteria, or places like the ASME code, then, then we were left defining it, in a generic manner, and that's why we put it in the first iteration, why we think it's important to keep in the second iteration.

We did make one change and that is, to reflect, and this goes to somewhat the, the discussion that we had, this morning, on, on the human factors element, that, in order to, perhaps, give additional

credit to inherent characters, characteristics, we say no single engineered design feature and, and then we would, in definitions and guidance, clarify exactly what this means.

But, this is trying to reflect that, if a characteristic can truly be shown to be inherent, then, as we talked this morning, that, that, that means there is little to no uncertainty that it's actually going to behave.

And so needing a defense and depth element, to address the uncertainty, may not be needed, if there is no uncertainty. So -- but -- but this is -- this is an area we continue to explore.

And, maybe, we would have to address this whole area of inherent characteristics, within some of the guidance documents, because it's an area you have to be very careful in, if you're addressing a particular inherent feature, it may exist, within a certain, I'll just say, a certain temperature range, for example.

Well, then you have to be very sure you're going to stay within whatever bounds that you can actually, truly credit that inherent characteristic.

So it's an area that we've not addressed, in detail, before, so it might be an area ripe for

guidance, when we talk about that, this afternoon.

So if we can, go on then, to 63? We will open it up to questions and, and observations. And the first one is a presentation that USNIC has prepared.

MR. DRAFFIN: Okay, thank you. I'm happy to go ahead, if that's appropriate. This is Cyril Draffin, from the U.S. Nuclear Industry Council. The -- you could probably go to the next slide, which is Slide 64, in the deck.

U.S. Nuclear Industry Council appreciates the extensive and time-consuming work the NRC Staff has done, to develop performance-based regulations and to share preliminary language and your thoughts, with the stakeholders, early, to get their comments.

We, as has been pointed out, earlier today, only have an incomplete view of Part 53, and we look forward to having a better understanding of the intentions of a complete 53.

We expect -- we're particularly interested in forthcoming language describing operational flexibility and we'll reflect upon the perspectives, the new perspectives, in some cases, that Bill provided today, during -- in the slides, so that's -- that's helpful.

We will consider what was being discussed today, as well as, looking forward to the additional parts, because it's, it's already been discussed, by Andrea -- you know, it's an iterative process and you have to look at the whole rule, before you can be clear that you really have the right language in, in B and C.

We are -- and, although, the NRC Staff Engagement Plan Milestone Charts have shown the April 21, or, or May, as the interim staff resolution for safety criteria and design.

We understand and appreciate that the discussions will continue. That, the language will remain -- the Subparts are open, for language changes, until the Rule is fully drafted and discussed. That was not, as clear, a couple months ago.

We do want to have Part 53, as transformative and flexible, and hope that the NRC Staff shares that perspective. We heard that, at the beginning of the call that, the -- all the structure wants to be transformative, and the industry is, kind of, counting on that, as being important, if you're really going to have a widespread deployment of Advance Nuclear.

But, based on the current path, some

aspects of the draft language are helpful, and some other parts are concerning, and we'd like to better understand them.

The (inaudible) sessions helped, but we do think that, though, some additional modification and clarification that will be required and we, obviously, hope that the, this effort, on the proposed Part 53, will result in a regulation, which is useful and used.

I might add that we think that, predictability and stability are important. We understand the need for specific performance criteria that must be demonstrated, every applicant must show that (inaudible) for safety.

We also want to have stability and that includes regulatory guidance not being changed, in the course of a design review going, going on.

So those, you know, the understanding of predictability and stability is important, as we go forward in the regulations. On the next slide, thoughts, worth going back to NEIMA, just, as the Human Factors people did, in their presentation.

NEIMA had some expectations that the -- and the purpose of it, is to develop in the expertise and regulatory process, to allow the innovation and commercialization of Advanced Nuclear Reactors.

And, we believe, it sets forth a rule that it will be technology-inclusive, such as there will be no fundamental challenges, to bar this regulation to any fission reactor, regardless of type and size.

And NEIMA explicitly states that, technology includes the regulatory framework, meets the framework, using methods of valuation that are flexible and practical, for the application regarding technologies.

We, the Industry, believes it should risk-informed, to focus on licensing development, review, and maintenance, the most significant safety, safety-significant elements of safety case, and provision for determinative insights, when appropriate. And it'll be performance-based, clear, consistent, understandable criteria, which the NRC is trying to do.

Now, we've listed some of our success criteria, which we're reiterating for what we said to the ACRS, last month. That would be a regular framework that is clearly understood, effectively applied, and the results and significant improvements, to the efficiency, timeliness, and cost-effectiveness, and also allows predictability, as, in the NRC's role in regulating nuclear power.

We want a framework that's founded on the demonstration of reasonable assurance, and we're a little concerned about the change in language, we'll get to later, of adequate protection and that, reasonable assurance applies for flexibility and regulatory stability.

And, importantly, from the perspective of and motivation developed and deployed Advanced Reactor technologies, the regulatory burden should not increase.

So if we go on to the next slide -- we appreciate the -- some of the changes that were made in the proposal, you know, how (inaudible) a PRA could be used, considering a graded approach for PRA, considering IAEA, as an alternative.

We thought, it's useful to have the value of inherent characteristics of Advanced Reactors considered, as Bill just mentioned, and the use of generally-accepted quality assurance standards.

But, we do have some ongoing concerns from the language, even after having heard some of the thoughts, from today. We remain concerned that the ALARA is in the regulatory language.

We -- it's been a policy, for years, we think it should be continued to be a policy, as it

has, in the past, but it doesn't necessarily have to be in the regulatory language, which we knew.

We don't fully understand the staff's view on adequate protection. We thought we did, before, but since the language got changed, we're now less certain.

And, we remain concerned over the two Tiers, as other people have addressed, other organizations, and we heard a little bit more about that, today.

Respect for the dialogue on defense and depth, some of the issues raised, today, haven't been resolved. And, we think that, the quantitative frequencies and the QHO values should be in guidance, rather than in the regulation.

We are committed a language and approach that's performance-based and simpler and, you know, we'll see how this evolves, as we go forward. On the -- but, we'll be retaining a judgment to reflect upon the things we've heard today.

If you go on the next slide, 67, I guess, just to highlight a couple concerns. We don't want the Risk-Informed Regulations, they have tradeoffs, but we don't the rule of the outing regulations to increase the burden.

We've heard about the first and second tier, we're still not sure exactly how that's going to work and, whether that's going to be next, a benefit, or if it just increases regulatory burden.

Maybe, it'll help, when we hear the details, in operations, when that portion of the Rule comes out, but, at this point, we remain concerned that it's a burden, rather than a, a benefit.

And, on the next slide, we touch upon the -- we don't want the rules -- we want the regulations to be simplified, we, and more concise, and we're concerned with the recent iteration of the safety objectives, because that may make the Rule more confusing.

We look forward to better understanding the intentions of staff. We've heard a little bit about that, today, and we'll have some comments, later, in the presentation, but, it's a concern to us that it seems to be more confusing, rather than less confusing.

So let me pause there, for a moment and just to see if there's any reactions, or questions the NRC Staff has on this, this, of the two, segments of our presentation?

MS. VALLIERE: Cyril, maybe, if I could

just ask you, to clarify something, I think, you said. This Nan Valliere --

MR. DRAFFIN: Sure.

MS. VALLIERE: -- from the Staff.

(Simultaneous speaking.)

MS. VALLIERE: Yes, sir. I think, you said -- well, with regarding your area of concern, on ALARA, that you said that you're concerned with it being in regulatory language and that it doesn't have to be in regulatory language, because that would be new. So I, I take it, you're not, you're not referring to the regulatory language in Part 20 --

MR. DRAFFIN: Yes, I think the --

MS. VALLIERE: -- which already exists, you're --

MR. DRAFFIN: Yes --

MS. VALLIERE: -- you --

MR. DRAFFIN: -- that --

MS. VALLIERE: -- referred to putting it into other places, in Part 53, can you just clarify that?

(Simultaneous speaking.)

MR. DRAFFIN: Sure. Two aspects to it. First, it is in Part 20, now. We see no reason to -- and you're referring to Part 20, for other operations,

and so I think it -- just leave it, as a reference, to Part 20, rather than explicitly adding it to Part 53. I mean, if Part 20 is going to apply, then, why put it in Part 53? So that would be the first point.

The second point, I know there's some different reactions in Industry about, whether ALARA is even appropriate, but I think that's, we're not really opining on that particular topic, today. If that helps?

MS. VALLIERE: It does. I -- I'm -- but I, I take it, you are saying, even in the second iteration rule language, the way the ALARA portion is worded, you're still not -- you still have concerns, with that?

MR. DRAFFIN: Yes.

MS. VALLIERE: Okay. Thank you.

MR. BEALL: Okay, any --

MR. DRAFFIN: Okay.

MR. BEALL: -- other questions from the Staff?

(Simultaneous speaking.)

(No audible response.)

MR. BEALL: Okay, Cyril, keep on going.

MR. DRAFFIN: Sure. I'd like just to ask, Frank Akstulewicz, to make a, a comment. I, I think,

he wanted to provide some perspective. So, Frank, if you would? And I'll -- and, after he makes some, a comment, then I'll continue with the second def.

MR. AKSTULEWICZ: Okay. I put my hand up. I don't know, if I needed to, or not, but -- so, Bill and Nan, I really appreciate the explanation that you guys have given, today, with respect to the foundational thinking behind the safety objectives and the Tier 1 and Tier 2.

And I'd really like to take you back to that slide, if I could? I don't remember what the slide number was. And there's a couple of thoughts.

That, one, I, I hope that you would, maybe, find a better example of -- yes, keep going. A better example to explain, where we are, with respect to the baseline level for -- yes, one more, I think.

Next slide, I think. Sorry. We'll keep going, sorry. It's -- it's the slide that explains the Tiering, not the actual language. There you go.

Yes that, that -- where, where you have the Tier 1 and Tier 2 and it shows normal operations and off-normal. They -- whoops. Anyway, let me continue, while we're trying to find the right slide.

First, I, personally, have a disagreement with the characterization that, the minimal level of

operation established by the first tier safety objectives would be comparable to a red binding of an operating LWR.

I -- I just, because the basis, and you've mentioned that, all the tech specs would be flowing from these requirements. If -- if all the tech specs are being satisfied and all the safety functions are being provided, that's certainly more than a red-level finding.

And, I think, we, it may be white, there may be some things wrong, programmatically, that need to get resolved, but you are providing everything possible that could be provided, so I'm not sure, exactly, why you would equate that, as part of an example?

Second, we haven't even established, why that reactor oversight, for an Advanced Reactor, might look like, in terms of, the grading.

So I think it, it's, kind of, unfair, but I know you need an example, to try to put things into context, I just hope you can find a different one, because I don't think that that's really fair.

MR. RECKLEY: Yes, well, just -- and I -- fair, fair enough, it's hard to come up with an example. I'll put it back on, on, on you, and --

MR. AKSTULEWICZ: I'd be happy --

MR. RECKLEY: -- would --

MR. AKSTULEWICZ: I'd be happy to try to take a, a try at it.

(Simultaneous speaking.)

MR. RECKLEY: Would simply showing that a plant does not exceed 25 REM, at the exclusionary boundary, be good enough?

MR. AKSTULEWICZ: No. And you know that and I know that, but, but also, the Tier 1 has all of your safety functions being satisfied. So -- so you're talking about an accident situation that may occur that is remotely possible and that being satisfied, as well as, the condition, where all of the important functions are being provided, including reactivity control, thermal conductivity, heat removal, mitigation, or retention, of (inaudible) safety -- fission products.

I mean, that, that's a pretty big envelope that, that you're saying, it's being satisfied and, yet, still it's, it's only barely operable.

So again, I'm not -- well, I, I don't want to argue it, here, that's not the point. I just think there's a better example and we need to provide that better example, if we're going to use ROP, as the

example, here. That's my comment.

But, second thing, I want to -- the -- this is -- could you advance the slide, maybe, one, or two, forward? Maybe, it's the next one. The question that I had there, was on the tiering and, and it appears, as though, normal operations is, both, found in Tier 1 and Tier 2.

And I note, some of the Industry complaint and I'm not representing any particular party here, with these comments. But I noted the Industry has expressed concern, about having normal operation, as part of Tier 1.

And, and it goes back to having specific requirements for qualifications and, of those systems, if they are specifically intended to be safety grade.

And, and this, this idea that, having normal operations requirements, in Tier 1, would make those systems safety grade, where not, necessarily, the case, in the current operating fleet.

And, and I know that's a general concern. Can -- can you speak to that? Because, the way I just heard the, your explanation of, of the ALARA part, there seems to be a factional split in how you view normal operations, what is the systems and dose criteria that's in Tier 1 and then, the, what I'll

call, the worker protection provisions that are listed in Tier 2, are you making that type of differentiation?

MR. RECKLEY: Well, yes. If you look at the safety classification, in Subpart C, you'll see, it only refers to, 220(B), for unplanned events.

So I, I, I know it gets lost in the Rule language and understand that, that some of this stuff, when it comes down to identifying a letter within a reference, it's subtle, but, but really, in terms of, the safety classification, it, it is intended, as it has traditionally been, the deck ease (inaudible) off of the unplanned events and that's reflected in this language by, when you look at the safety classification, it only refers to 220(B), not 220(A).

The -- and then we, we, we also put, in the discussion table, an acknowledgment that, if, as we develop the rest of the subparts, we don't see where we make a distinction, or a decision, based on the difference between the normal ops, under the first, and the normal ops, under the second tier?

Then, it might be appropriate to maintain normal operations, as requirements, but also, to move it over, in a manner similar to what we've done for occupational, to make clear that it's -- that the --

having it in the tiered language doesn't introduce confusion.

And -- and that might go, for example, in my mind, to reading the, the objectives and having people say, well, is the 100-millirem, because it's in the first year, is that associated with an immediate threat to public health and safety?

And so to, to me that, that, that would be a rationale to say, the way we have it constructed, there's some, there, there's some question about, whether it belongs in the tiers, or not.

So that's -- yes that's still in play. We think it's important to keep a requirement for normal operations, however, whether it's reflected in the Tiers, we're, we're waiting to see, as I said, primarily, as we get to the other subparts, is the distinction used to make a decision or not?

MR. AKSTULEWICZ: Okay, I appreciate that. Thanks, Bill. And I, I guess, you, you, kind of, touched on what my last question was, so it's not -- what I heard you say, is you're not wedded to the tiering approach, yet. But, what I -- my comment was, and --

MR. RECKLEY: For --

MR. AKSTULEWICZ: -- I don't --

MR. RECKLEY: -- for, for normal operations.

(Simultaneous speaking.)

MR. AKSTULEWICZ: Yes -- oh, I was just going to get to that. So my question is, and, maybe, it's a subtlety that I missed, in your presentation, but it seems like you could accomplish everything that the Rule is asking for, without calling it Tier 1, or Tier 2.

And it's not clear, to me, and maybe that's why the Industry continues to be confused, not that I'm any smarter than anybody else, but it, it would -- it doesn't -- tiering suggests some importance level, in terms of, you know, first Tier being most important, second Tier being lessor important.

But -- but that's not, really, the case for this Rule, as, as I read it. It seems like the regulations that are in Tier 1, or the regulations that are proposed in Tier 2, have the same importance.

And so -- so that -- I think that leads to the confusion, about this tiering concept. And, and I don't expect a comment, because I, I, I fully-accept that you guys are still thinking about, you know, how this, how to make this work, or if it doesn't work.

But that's -- that's my -- that's my comment, about the two Tiers, is these regulations seem to be of equal importance and don't suggest any differentiation in importance that a tiering might suggest. That was -- that's my comment. I'll stop there.

MR. RECKLEY: And we'd be, certainly, amenable to, to different language. We have a -- we, we have a placeholder, to see, to see, whether there's a different way to phrase this.

Not only, because of what you just said, but also, because first Tier, second Tier sounds a lot like Tier 1, Tier 2, which is used in Part 52, and, and so that's led to some confusion.

But -- but what is intended, by having the distinction between, let's say, Group A and Group B, is, is that, Group A comes out of the DBA and it is used in, in determining safety-related equipment, it's used in defining technical specifications, and, and would provide this, as I said, earlier, a minimum level.

And, and you could always say that, because it's controlled by those firm regulatory requirements that, there's always that level of competence that, that, at least, the plant has

maintained, to address that, which we, now, equate to be an immediate threat to public health and safety, which is language that was taken out of the, the, the history of technical specifications.

And the second group, Group B, is, plays an important role in ensuring the safety of the plant and, and, and is characterized, in a, in a risk-management framework, and -- but, but that group, by its nature how we set this up, would have more operating flexibility.

It's this non-safety-related with special treatment equipment, it's going to be handled, under licensee programs, there would be less information in the SR, about that equipment.

And, and, and so there is a distinction and importance between the grouping, whether we call it Tier 1, Tier 2, or Group A, Group B, that, you know, we can talk about the, the terminology, but, there is an importance to having a distinction between the groups.

MR. AKSTULEWICZ: Thanks, Bill. I really appreciate that. Thanks, for answering my questions.

MR. DRAFFIN: Okay. So this is Cyril. I'll continue on. You can go up to Slide 69, and then, after I finish, I know there's some additional

people that have their hands raised.

So for safety objectives, which we just heard, came from the history of tech specs, we did not, this is U.S. Nuclear Industry Council, do not recommend a change to the first objective, or the second objective. And, in fact, we were supportive of using adequate protections, as the main standard, in part, because it has a lot of case law.

The -- the suggestion, Dave, that you didn't like the Atomic Energy Act, and the language there, so you came up with other language, hasn't been, hasn't been understood, or, maybe, well-received, yet, in terms of, why that change was made, in this iteration?

And, why adequate protection, which has been used a lot in, you know, for decades, and, and 50 and 52 are, is being discarded, or at least, not, no longer being used, as a safety objective. So we, we have some concerns over that, particularly, with the second iteration.

On the next slide, the -- dealing with first Tier, Safety Criteria, and you're referring to Part 20, for Section D, which is appropriate, for normal operations.

And, we just had the discussion of,

whether it should be pulled out of the safety criteria language and for normal operations considered like, protection of plant workers and not be in the Tier 1 Tier 2 structure, if that's maintained, so we think it should be pulled out.

We have been -- we're still thinking about it, but one thing is to put -- one approach would be to put the frequencies in the guidance, rather than in the regulations.

So we'll, we'll stop there, for criteria, because we wanted to think about, for First Tier, because we wanted to think about what we heard today.

On the second Tier, we -- on the next slide. The discussion date was helpful and today's slides helped to give us better background on what the NRC staff was thinking and we've already talked about ALARA.

And we, we were one of the people that had recommended dropping the second Tier safety criteria. We think it's -- we still don't understand, even revised draft, why -- the real value.

And we've heard that it might be forthcoming, when you've, when we get the language, on operations, but we haven't seen that, yet, and so without that clarity, it's hard to see the usefulness.

And, also, we'd asked, before, but we're still curious, why the NRC changed the QHO language? Because, I think, the terms are, are different than they've been used, before.

On the next slide, on defense and depth, we had -- we continue to have some concerns, about the approach. We think that defense and depth is important and needs to be included, but -- and, I think, it's good that you've addressed a engineered feature and the inherent features and thinking that through, in terms of guidance, is appropriate and good.

Because, it's an important concept and it will be done, by Industry, the question is, how it's referred to? So we know it's an important design philosophy and further discussion is needed on it, and so it's a question of, how will it best be done?

Rather than dwelling on that, we can go on to the, the next slide, on protection of plant workers, and this is a little bit of reiteration.

You know, we, we suggest referencing Subpart C, and D, and Part 20, and that this doesn't really -- the protection of plant workers doesn't really apply to the design of the facility and, and we've already -- we're not sure how these operational

requirements will be, will be demonstrated.

So I think that, if you go to the next slide, that's the end -- that's so you can get some points of contact, if you have questions, we will follow-up on it. I do think, Jeff Merrifield wanted to add one additional comment.

(Whereupon, the foregoing matter went off the record at 1:50 p.m. and resumed at 1:50 p.m.)

MR. MERRIFIELD: Yes, Cyril, thank you very much. Actually, it's sort of three comments I would add.

The first one, the difficulty of having to present slides like these in advance of this very same meeting, where the NRC staff are trying to explain a rationale, there is a bit of notion of letters passing each other in the mail. So, obviously, there's going to be need for us to get back and talk to our advanced reactor developers and other members and reflect on what the staff has said today relative to Part C, the same thing for Subparts B and C, in the presentations today.

The second comment I would make -- and this is not fully reflective of the discussion today -- but I know, in further thinking of discussions we've had with the staff, NIC has recommended, as I

think NEI has as well, in some areas we think guidance would be appropriate for some elements of what's trying to be accomplished.

One of the responses we got from the staff was, well, it's a resource issue and we're challenged for resources. And I would want to say for the record, if there is guidance that the NRC staff believes would be appropriate and they don't believe that they have sufficient resources, we certainly would be happy to work with folks up in Congress to make sure that those resources are made available to the Agency. Not pursuing what should be the right outcome shouldn't be related directly to that. If we need to get more resources to the Agency, then I think, collaboratively, we're willing to help find that or urge that off the fee base in that regard.

The final comment -- and this is an individual one -- there have been separate meetings on fusion as it relates to Part 53. I know the comment that Bill made later that you're reserving the potential to include Fusion's utilization facility in this effort. I just want to make it clear, my understanding is that the Fusion Industry Association, I don't think there's anyone involved with that who has really requested that. I don't think there's any

planning of which I'm aware of anyone expecting that they would be regulated as a utilization facility. Indeed, I think they're focused more initially on Parts 30 and 20 in regulating those facilities more as byproduct facilities.

And finally, given the timeline that the Agency staff has, as directed by the Commission, to provide fission-related options under Part 53 within the 2024 timeframe, that is not in alignment with where the fusion industry is right now. And they indicated in their recent meeting that they would not need a regulatory framework for power-related activities in that same timeframe. So, I just want, for the completeness of the record, to indicate that in the context of this meeting.

Thank you.

MR. BEALL: Okay. Thank you.

MR. DRAFFIN: That's all I have, unless NRC staff had any immediate questions or comments.

MR. BEALL: Okay. Thank you, Jeff and Cyril.

Next slide, please.

So, would the representative from NEI would like to say anything about Subpart B?

MR. O'NEILL: This is Marty O'Neill. Can

you hear me okay?

MR. BEALL: Yes, we can, Marty.

MR. O'NEILL: Okay. I appreciate that.

Just a few preparatory remarks. Again, I wanted to echo what Cyril and Frank said in terms of appreciation. We really do appreciate the staff's efforts on this front. We recognize that developing, essentially, a new licensing framework for evolving technologies is a substantial and complex challenge. It's a Herculean effort.

I know at NEI we meet weekly to discuss these issues. So, we really do appreciate the effort that you're putting forth, especially on an expedited timeframe. And I know we provide feedback, and maybe sometimes it comes across as a criticism of the staff; that's not the intent. Again, we have the same goals here, ultimately, a clear, efficient, predictable licensing framework that's adequately protective of public health and safety. I think from the industry's perspective, of course, we need it to be commercially practicable, too. So, that, obviously, informs some of our feedback.

Second -- and this kind of mirrors what Jeff said -- we're, obviously, still digesting the second iteration of the rulemaking language. So, it's

conceivable that some of it addresses our concerns, or some of the explanation that the staff and Bill have provided today address concerns, but I can't say definitively. Again, we still need to continue reviewing this and vetting it internally.

And the third point I wanted to make is, in Marc Nichols' absence today, I think our feedback is going to be more in the form of feedback by committee. I do want to speak to the adequate protection issue. We have invited other representatives of our members to speak, if they're so inclined, (audio interference) consultants as well. I know Frank has already provided some viewpoints. I know he couched them as his personal views, but I don't know if I want to add anything else.

I think we've invited some representatives from Oklo to potentially speak about ALARA or PRA issues. Niko McMurray from ClearPath may speak about regulatory language, kind of overall-approach-type issues. And Doug True, our CNO, I think is on the line, and it's conceivable he may chime in at some point, too.

With all that said, I just wanted to, as a lawyer, kind of speak quickly to the issue of adequate protection. Again, we appreciate the staff's efforts

to respond to comments.

We do have some concern, I think, like Nik, with the removal of the adequate protection language and kind of the substitution, if you will, of some alternative language. I think 53.200, you now have reference to the objectives of limiting the possibility of an immediate threat to the public health and safety and considering potential risk to public health and safety.

And unlike adequate protection and minimizing danger to the public health and safety, these new objectives, to my knowledge, don't appear anywhere in the Atomic Energy Act. To my knowledge, they haven't been really universally and routinely applied in licensing new reactors.

So, from a pure legal standpoint, I am, or we are, somewhat concerned about that engendering some confusion and uncertainty moving forward, when under NEMA I think the NRC's own principles of good regulation, we want regulatory clarity and certainty in the new reactor licensing process.

So, for these reasons, I think it's still important to incorporate the reasonable assurance of adequate protection standard, which is also sometimes referred to as no undue risk to the public health and

safety, in the regulations. I heard Juan mention it in discussing the white paper, and Bill seemed to suggest that it would still play a significant role in the NRC's ultimate findings, but it's not quite clear to me, given the new, revised language, how that will be the case.

But I think it's important because the reasonable assurance of adequate protection standard has been in place since the enactment of 182 of the Atomic Energy Act and the industry's inception. It's been applied in countless licensing decisions over the years or decades. And it is, as Cyril pointed out, elucidated by the courts, the Commission, in NRC Policy Statements, and in NRC guidance.

Interestingly, it's actually in the NRC's Inspection Manual, Part 9900, "Technical Guidance". There is some discussion that I think is worth reading into the record. And that document states that "The Atomic Energy Act of 1954, as amended, establishes adequate protection as the standard of safety on which NRC regulation is based. In the context of NRC regulation, safety means avoiding undue risk, or, stated another way, providing reasonable assurance of adequate protection for the public in connection with the use of source, byproduct, and special nuclear

materials."

And this particular Inspection Manual chapter goes on to discuss the nexus between safety and compliance. And in doing so, it states that "NRC requirements, including tech specs, license conditions, orders, regulations, have been designed to ensure adequate protection through acceptable design, construction, operation, maintenance, modification, and quality assurance measures."

And then, it goes on to say that "Adequate protection is presumptively assured by compliance of NRC requirements." It acknowledges that circumstances may arise, when new information reveals -- for example, unforeseen hazards exist or there's a substantially greater potential for a known hazard to occur -- in that case, the NRC does have the authority to require action above and beyond existing regulations to maintain adequate protection.

So, again, it's central to the NRC's full regulatory and licensing scheme. And so, that gives us pause to move away from that language.

I think it also makes the point that some requirements are more important to safety than others, and that the Commission should use a risk-informed approach, wherever possible, when adding, removing, or

modifying NRC regulations, as well as when applying NRC resources to the oversight of licensing activities.

So, I think what Frank said, and kind of resonating with me, maybe why do we really need future structure, and I'd like to kind of better understand in terms of requirements being imposed by the two tiers or two groups, is meeting all of those necessary to adequate protection?

So, again, I think that, to summarize, we continue to believe that reasonable assurance of adequate protection is fundamental to the licensing scheme. We think the NRC already has the tools in place in the form of various guidance documents issued by NRR and NMSS to apply the reasonable assurance standard, including in new reactor licensing proceedings. I think we cited a couple of those guidance documents in our February 11th, 2021 comments.

So, again, I think we're still wrestling with maybe why we need the two-tiered structure. I think if the staff is going to retain that structure ultimately, we probably would prefer to still see adequate protection and minimize danger.

And I think the concern kind of with the

minimized danger second-tier standard was that we might end up with requirements that, maybe while imposing extra adequate protection, aren't cost-justified. And so, again, that's something I'm trying to better understand here: what, ultimately, does the industry have to do to satisfy the adequate protection standard?

With that, I'll invite others, other NEI Part 53 Task Force participants, to chime in on any of the issues that Bill just walked through, whether it's adequate protection, two-tier structure, ALARA, et cetera.

Thank you.

MR. BEALL: Okay. Thanks, Marty.

MR. RECKLEY: Yes, this is Bill.

While we wait to see if any other NEI person wants to talk, we're not arguing that the adequate protection is a foundational element of the Atomic Energy Act. But most of you also know that over the years the Agency has not defined it, in particular, beyond saying the presumption argument that it would be satisfied by the regulations, and that's what the memos that were just referred to also reinforce.

And so, the difficulty that we introduced

-- and I'll take a large part of the blame for trying to introduce it -- was to actually add a technical definition and to segment what we have historically not necessarily segmented, especially with new licensees, which is the difference between what is absolutely needed for adequate protection and what might be added for other reasons.

But, that said, the variety of comments -- your proposal to go back to the memos on reasonable assurance of adequate protection, which, again, avoided a definition and simply said adequate protection is presumed by compliance with regulations, just kind of reinforced that maybe this was not -- it was, actually, I know changing leads to confusion, but having it there as the first iteration was also leading to great confusion.

And so, within our discussion table, we basically try to say that we'll go back to the traditional -- not abandoning it; it's fundamental to us -- but to go back to the more traditional approach to saying that, and we will make a reasonable assurance of adequate protection finding based on the reviews. And by the time we are done with Part 53, we will be able to make the same presumption that, if you comply, if a party complies with Part 53, that it does

provide the necessary confidence that we have adequate protection.

But I see a lot of hands raised. We're falling a little behind. So, with that, I'll just say that's the challenge. We recognize it. We're not at all proposing abandoning it, but maybe we went too far when we actually tried to assign a technical definition, and that has led, both internally and externally, to a lot of comments. And we just backed up a step.

So, Nan, I think, did you have something?

MS. VALLIERE: Bill, you essentially covered what I wanted to say, which was just that I was concerned that there was this concept that the way findings were made for new licenses under the current framework, that we were somehow trying to make those findings, going to try to make those findings differently under Part 53. So, I think you, essentially, covered that that's not what we're trying to do.

MR. O'NEILL: Okay. That's helpful. And again, we appreciate the challenges here, and I fully understand your point in terms of adequate protection and what it means and what it doesn't. It doesn't lend itself to a glossary-style definition, if you

will. But I'm not sure substituting alternative phrases is the right approach, either. But, again, that's not a criticism. We recognize the challenge here.

MR. RECKLEY: Right. We're already beginning to work on the third iteration. So, anybody that has ideas, we're open.

MR. O'NEILL: Yes. Okay. And I don't want to monopolize too much more time.

I think just one point I wanted to make on ALARA is, again, we recognize that ALARA requirements are already on the books in Part 20 and a portion of Part 50. It's not an aversion to ALARA; I think it was more of a concern that, are they being elevated to something well beyond what they are now? I think some of your explanation today, Bill, about kind of the alternative to -- what did you have? -- the single failure criterion and having to have some alternative approach is certainly helpful from my perspective. But I just wanted to emphasize that we're certainly not flat-out opposed to the ALARA concept. It's just we've always viewed it as more of an operational or operating principle and something that licensees inevitably strive to meet in any case.

So, thanks.

MR. BEALL: Okay. Thank you, Marty.

Before we get into the discussions from the stakeholders, I think Mo Shams would like to say something.

Mo, you can unmute.

MR. SHAMS: Thanks. Thanks, Bob.

Yes, I wanted to, again, just follow up on the various parts of the conversation. We appreciated the comments. We appreciated the very thoughtful input on the various parts of the rule that were changing.

But I just wanted to sort of maybe go back and just comment on what Jeff said earlier about guidance. So, resources are not really the constraining aspect in guidance in our view. We're well-funded for the Part 53 this year and into the future.

The guidance really is a collaborative effort, is one that actually requires thorough discussion with the industry. So, our ability to actually get meaningful guidance relies on a couple of main factors.

No. 1, the rule has to be an implementable one and one that has clear criteria, such that we develop guidance that's appropriately oriented towards

such criteria. So, therefore, we need to be working towards clarifying the rule, and then, the guidance comes with that.

And then, the second part is the ability of our stakeholders to be able to actually meaningfully participate and have the right opportunity and the right amount of time to respond and provide meaningful comments, such that the guidance is meaningful to them.

It's really the dynamic that we need to balance. So, it's not really a lack of resources. When we've expressed in the past our challenge with some parts of the guidance, it's not intended to be resources.

And as the staff is going to indicate a little bit later in the presentation, we do have a roadmap for guidance, key parts of it, as well as other parts that come on later. So, as we identify additional guidance, as we identify additional areas for guidance, we'll build those in and we'll build them in the right amount of time.

So, I just wanted to make that clarification on where we stand on guidance. Thanks, Bob.

MR. BEALL: Okay. Thank you, Mo.

Okay. Ed Lyman, you have your hand up.

DR. LYMAN: Hi. Yes. Can you hear me?

MR. BEALL: Yes, we can. Go ahead, Ed.

DR. LYMAN: Yes. So, I don't want to pile on. I'm surprised I find myself saying this, but I have to agree that I don't think your second iteration of the safety objectives is going the right direction. In particular, to make the fundamental safety criterion just limiting the possibility of an imminent threat to public health and safety seems like a pretty weak statement to me. I would hope that adequate protection is more than that. So, I am concerning about using that as a standard.

And as far as the tiering, after what I've heard, I'm also surprised I'm saying this, but I'm starting to wonder if it might not be better to reference a frequency-consequence curve in the regulation, having a continuous limit, rather than two tiers, and then, provided that there's sufficient margin required between the calculated frequencies and consequences when comparing to the values in the frequency-consequence curve. It seems that that might be, actually, a simpler approach than trying to subdivide into two tiers.

I do have one question. So, when you

rewrote the first iteration, common defense and security disappeared as an objective, and arguably, it may not be a safety objective, but I didn't see that reappearing anywhere. How are you planning to handle that particular aspect of the Atomic Energy Act requirements?

Thank you.

MR. RECKLEY: Yes, and we've picked up on that point internally, too. We're not looking to change anything in that regard. And it just was happenchance that, as we took out the language directly from the Act related to adequate protection, that includes public health and safety and common defense and security, and replaced it with threat, threat to public health and safety, which could come from either a safety -- I mean an internal, external, or security-related event -- we thought it was included, but it's raised enough internal questions that we'll probably put something back in there about that.

DR. LYMAN: All right. Thanks.

MR. BEALL: Okay. Mike Keller, you have your hand up.

MR. KELLER: Yes, this is Mike Keller.

MR. BEALL: Okay. We can hear you, Mike.

Go ahead.

MR. KELLER: Yes. Okay.

We continue to struggle with trying to get our heads around all this. I have a couple of observations and questions.

Maybe we're missing something, but there doesn't appear to be any definition on what constitutes an immediate and potential risk. Does this lead directly to some kind of quantified dose and frequency? It's kind of a passing observation. Why don't you just use the traditional approach with clarifications for advanced reactors?

The second item is on the ALARA with respect to offsite doses. There aren't any goal posts when you use that approach and it kind of leaves the designer adrift. The ETA provides guidance and it's not a Code of Federal Regulations requirement.

Is the 100-millirem limit, is that the target for routine operations, I guess? But if that is, then why would you need ALARA?

Then, the third item is we think you're missing a huge public relations opportunity by not lowering that 25-rem target. With the lower limit, it will significant boost sagging public confidence in nuclear energy. The lower limit inherently provides

more margin, and the advanced reactors should have no problem with the lower limit, whatever it might be.

But, ultimately, we think Ed Lyman's basic observation on unknown risks has considerable merit, and we have the opportunity to provide additional margin with no real impact as far as the advanced reactors are concerned.

And then, that's it.

MR. RECKLEY: Okay. Yes, in regards to the immediate threat, we equate that to what you commented on in your third comment. That remains tied to the 25 rem at the exclusionary boundary numbers, our historical numbers.

In regards to your second question, now 100 millirem a year is a limit. That's not a goal. The goal would be in the single-digit millirems. And that's reflected in the ETA and in the existing performance goals in Appendix I. And so, again, we're trying to think how to word that.

The other aspect that's always been part of Appendix I, and the overall approach to as low as reasonably achievable, is it includes the consideration that at some point it costs too much to get too little return. And so, that's built into the process, the ability to consider costs in how far down

you try to go in the performance goals.

MR. KELLER: Well, I understand that, but what I'm driving at is in terms of from a design perspective. What's the target you're trying to hit when you develop your design?

MR. RECKLEY: Right.

MR. KELLER: If you have no goal posts and it kind of moves around, that's not helpful.

MR. RECKLEY: And again, that was traditionally provided by Appendix I. And we're looking at what to put in its place.

MR. KELLER: But, right now, as far as offsite doses, it's ALARA, is that correct?

MR. RECKLEY: Correct.

MR. KELLER: I mean as currently written. Okay.

MR. RECKLEY: Yes, but the last part, where we had the holder in the draft language, was whether we would put in performance goals, as is provided in Appendix I to Part 50.

MR. KELLER: You mean performance goals for the operations?

MR. RECKLEY: Yes.

MR. KELLER: As opposed to in the design, for instance, I guess?

MR. RECKLEY: Well, it's a combination of design and operations, yes.

MR. KELLER: Okay. Thank you.

MR. BEALL: Okay. Niko McMurray, you have your hand up.

MR. McMURRAY: Thank you. Can you hear me okay?

MR. BEALL: Yes, we can, sir. Go ahead.

MR. McMURRAY: Awesome. Thank you.

Thanks. First, I just want to thank Bill and Nan, and the other NRC staff, because this is really a lot of work and effort. So, I commend all of you on that, and I definitely recognize the challenge of balancing all of the stakeholder feedback.

So, I've been participating in both the NEI and the USNIC working groups, but I'm speaking on behalf of ClearPath.

In listening to a lot of the discussion and seeing the second iteration of ruling, which, especially in regards to kind of the Tier 1 and Tier 2 and the different licensing pathways to meet the requirements, I really want to focus on the fact that, looking at the rule -- and I think Frank touched on this for how would normal operations be actually implemented as part of the Tier 1 -- taking a step

back and really looking at the format of the rule, and making sure it's simple and performance-based.

Bill, you had the concern earlier of, how can Part 53 address different designs, using the different pathways? And you seemed to propose you could use Part 50 or the more kind of deterministic approach. Obviously, we recognize that would require the applicable regulations in Part 50 and the applicable guidance, and it really would kind of have the same issue we're wrestling with here, where we have an opportunity to develop Part 53 to be that performance-based rule, to have those requirements -- the dose requirements, the safety functions -- that can be applicable to a variety of different designs; that will have different safety cases and be able to justify safety in different ways.

Because if you have those clear requirements, it's easy for industry to understand what they need to meet that. It makes it easy for staff to also understand what's needed to make that reasonable assurance finding.

And from there, then it's the processes to get to those performance-based requirements. So, it's setting it up where, if I'm using an LMP-like approach, QHOs might be more relevant in order to have

those frequency metrics for different events. If you have a graded kind of PRA approach based on your design, you may need to do something different or incorporate other ways for the level of detail, or incorporate things with like the next incredible accident, or some approach like that, where you can justify safety using different means, based on the specific design.

And that's also, I think, with kind of the hybrid approach or the IAEA approach. There's a lot of different ways to get there if the rule is structured where it's high-level and kind of simple and straightforward.

So, it's a high-level comment, and I think it touches on a lot of things that also Cyril is going to talk about, or has talked about as well, where, again, looking at how the rule will actually be implemented is, I think, going to be more important than some of these challenges that you brought up, Bill, regarding the different licensing pathways, where there is an opportunity to make the rule amenable to those different pathways.

MR. BEALL: Okay. Thank you Niko.

Ross Moore, you have your hand up.

MR. MOORE: I do. Can you hear me?

MR. BEALL: Yes, we can. Go ahead, sir.

MR. MOORE: Yes, I just wanted to, I think, echo some of the discussion already on ALARA. I appreciate, Bill, actually, a lot of the discussion that you have been able to provide today with respect to the staff's considerations for response or iterations associated with some of the inputs you received with regard to ALARA.

I think the main concern, in general, was the fact that ALARA isn't representative of a performance criteria. It's really an operational philosophy. And the potential for that, you know, when defined in safety criteria, to, then, extrapolate out through how one designs or develops programmatic controls and design features to support second-tier functional design criteria, as I think the rule is currently articulated, but establishing what ALARA actually means, to demonstrate not just an ambiguous, never achievable value, but, rather, what is demonstrative of safe operation, is important. And I think that goes back to ensuring design predictability and the reviewer biases, and able to propagate and create challenges through the design review.

MR. BEALL: Okay. Thanks, Ross.

Do you have something to say, Bill?

MR. RECKLEY: No, no. Go ahead.

MR. BEALL: Okay. Steve Kraft, you're next.

MR. KRAFT: Yes, thanks.

I'm not going to repeat what was said a speaker or two ago about looking for other ways to include -- it's, again, a licensee to provide the information that responds to a concern NRC might have. I mean, putting something in a rule that, heretofore, has not been in a rule, I think everyone recognizes can lead to licensing consequences down the road that were completely unintended. We end up with a rule that we never really wanted. As Cyril pointed out, there are licenses that don't help. But I'm not going to repeat all that.

But the sense I'm getting, Bill, is that there's an effort not just to include everything you could possibly imagine might happen in future technology in the broadest way possible in terms of being inclusive, but did I hear you say that some of the driving interest at NRC is to account for the fact that these might be inexperienced licensees? Did I hear that correctly?

MR. RECKLEY: I don't recall saying anything that would imply that. But, I mean,

ultimately, the licensing process all together should address that issue. I mean, a license would only be provided once they have stated they're up to the task. So, yes, I don't know from where that came, but I hope I didn't say something like that.

MR. KRAFT: No, well, I agree completely on that answer, Bill. I was just looking over my notes here. I thought I jotted that down.

Because what that really raises is that the regulation can say what it has to say in terms of what I said, what we just said before, about maybe not including specific requirements in a regulation that is simply to get the licensee to tell you something that you need to know. But, once you've got all that, I mean, you will know -- you, NRC, will know -- when it comes to licensing a specific facility in a specific location, you will know whether or not that licensee is making a case, when they've got enough experience, whatever you're interested in. And to the extent there are concerns then, that, to me, goes into conditions for that license, as opposed to lumbering the rest of the industry with requirements.

Because, at some point -- and I don't mean you specifically, Bill, or anyone individually -- the NRC, as a body, is concerned that, well, something may

be down the line somewhere that we can't predict. Therefore, we need to include something in it now kind of thing. You're never going to out-think all of that for sure.

So, I just raise that as a possibility, which kind of goes to the point about searching for other ways to accomplish the same goals without loading stuff into a regulation that could lead to unintended consequences.

Thanks.

MR. RECKLEY: Okay.

MR. BEALL: All right. Thanks, Steve.

I don't see other hands raised.

MR. RECKLEY: Okay.

MR. BEALL: Yes.

MR. RECKLEY: We can move on, then, to the next part.

MR. BEALL: Yes, Subpart C. So, go ahead, Bill, and walk us through that, please.

MR. RECKLEY: Okay. If we can, then, go on to 78?

So, in Subpart C, on design and analysis, there were, obviously, some comments on the requirements to, or the first iteration language which requires a PRA, and then, more specifically, the first

iteration language that said the PRA would be used to do a series of activities related to the design and licensing.

So, the second iteration, if you're going to 79, slide 79, our second iteration is to maintain a requirement for a PRA that would be used, in part, to still look at what's currently called the second tier safety criteria. But it does try to acknowledge that there are other systematic approaches that one might take to actually identify the licensing basis and classify structure, systems, and components. And so, we added the language that is highlighted on the slide.

This does go to a request, really, to the stakeholders here to kind of decide on this framework. And you can see in our second iteration a little bit of hesitancy to go up to such a high level that Part 53 can, basically, accommodate any approach. And again, part of that is because we're trying to maintain an integrated approach. Somebody mentioned earlier the BowTie diagram that I've used in numerous meetings. And when you're trying to put together such an integrated approach through design, giving credit in the design for consideration of margins for potential operational flexibilities, it requires a

certain level of information to be in the regulation in order to meld that structure that we're trying to build.

We think we can make that work while acknowledges that an alternate approach might be used. And we mentioned in the discussion table, for example, if you wanted to use the IAEA approach, you can probably take a step in that direction.

But the concern becomes, then, if you've taken that approach -- and I used single failure earlier, right? -- the IAEA approach roughly modeled, enhanced in more recent years, but basically structured like Part 50, it has that embedded in it. And it has the Part 53, what I call the barrier-based approach, right? It's less oriented to things like functional containment. It's more oriented to a very traditional free barriers, fuel cladding. I mean, it's based on light water reactor technology, both the IAEA and Part 50 standards. And so, it's built that way.

And to try to force-fit that into Part 53, I'll be honest, it's a challenge to us. And so, one of the things I'll ask stakeholders to really think about is we're developing a framework. Part 53 does not have to be the only part of the framework. We

will, as we'll talk about in future months, we're already talking and preparing language for 73 on security. That will be in Part 73.

We'll talk, when we talk about Subpart E, in manufacturing, we're already looking at Part 70 and 71 on the handling of special nuclear material and possible transport of manufactured. So, we have in play other parts of the regulation.

If some subset of advanced reactors are feeling strongly that they have an approach identified, such as SSR-2/1, consider whether a more efficient process would be for us to go in and address your concerns in Part 50 than to try to accommodate and make Part 53 a one-size-fits-all approach. Because it becomes problematic because Part 50 and the IAEA standard, it's kind of a different philosophy than the risk-informed approach that we've tried to build Part 53 upon, which, again, from our standpoint, is the evolution that you can take back to NUREG-1860 and the effort to develop Part 53 in 2005, and so forth. It's an evolutionary approach that has gone to the more risk-informed approach a la what Ed Lyman talked about. And we considered this in the first iteration, to actually put the frequency-consequence in. But there are two kind of different design

philosophies, and it's very difficult to address them in one regulation.

So, again, maybe a homework assignment for stakeholders: step back, broaden your view not to just Part 53, but to what a framework could include, and if it includes changes to Part 50 to accommodate some of those issues, we're amenable to that. And if it turns out that's an easier approach, then we could do that.

So, if we go on, then, I only have, basically, one other slide in this subpart, which is feedback we got from the ACRS, which is to look at chemical releases when those chemical releases are also associated with a radiological hazard. So, not expanding the role of the NRC, but just recognizing that there would be radiological issues that happen coincident with chemical releases. And in other areas like fuel cycle facilities, the NRC has taken on that task. So, if stakeholders have feedback on this topic, it's one that we are currently evaluating, but we don't have language in Subpart C currently on non-radiological hazards.

And so, I think, with that --

MR. SEGALA: Bill?

MR. RECKLEY: Yes?

MR. SEGALA: This is John Segala. Can I say something really quick?

MR. RECKLEY: Sure.

MR. SEGALA: Yes. I was just going to add on to your to your discussion about, you know, maybe building something into the framework of Part 53 to make changes to Part 50. And that could be done in such a way that a non-light- water reactor wouldn't necessarily need to take all of the exemptions that they would currently need if they were to go under Part 50.

So I just wanted to throw that out because there seems to be some concern from industry on, you know, pursuing regulations that aren't suited for them that require a lot of exemptions to be requested.

MR. RECKLEY: Well, that's what the tweak to Part 50 could try to accommodate. But really from our perspective and what we're seeing, again we don't do surveys or anything because we're not allowed.

But from our perspective, what we suspect is the most interest in the Part 50 approach is from light-water small modular reactors. And to some degree they best fit into Part 50.

Obviously, the SMRs don't fit perfectly into Part 50, but they are a closer fit. And we

understand the rationale in terms of trying to maybe use the high AEA standards and so forth. Whereas, the non-light-water reactors, there's always been a gulf between trying to fit them into Part 50. And so they would have probably the least interest into that kind of an approach.

But we would try to craft it both ways so that a non-light-water reactor proposing to use the Part 50 or IAEA approach could do it. And we would minimize to the degree we could exemptions and try to accommodate items that are identified to us by stakeholders.

And likewise in Part 53, there would be nothing that would preclude a light-water SMR in the future from using Part 53. It basically is already technology inclusive. But it is a different design approach, a different regulatory approach than the traditional barrier based Part 50.

So we can try to accommodate it both ways. And that would be an alternative to trying to make Part 53 have multiple possible paths or basically two regulations within, you know, one part.

And so again, we haven't reached any conclusion. It's a request for stakeholders to just take a step backwards, look at the whole framework and

say could this perhaps work a different way given we're not constrained to do everything we need to do within Part 53 so.

And with that, Bob, I think we can see if there are comments.

MR. BEALL: Go to the next slide. Okay. Marty, do you have any comments?

MR. TRUE: This is Doug True. I have some comments. Marty may be waiting for me.

So first of all, I've been listening all day today and intend to stay on all the way to the end of the day. This is my first time sitting in on one of these interactions. And it's clear the NRC staff has put a lot of thought and time and effort into development of this. And it's a very complicated problem, and we appreciate the iterative nature that you are working through on this and the opportunity to provide input.

I did want to go back to Slide 79 and ask Bill a couple of questions on the subject to where it is at hand right here.

And that is in the language, you opted to say the PRA . . . must be used and sort of now a new informational statement that you just spent about 10 minutes baking away from.

But why did you choose to say the PRA rather than saying a risk-informed process or something that gave you a little bit more flexibility as different approaches are brought to you to be used that could be on one hand or more predicated or less predicated on PRA but still risk-informed? Is the question clear, Bill?

MR. BEALL: Bill, are you there?

MR. RECKLEY: Yes. Sorry about that. Yes, I think, Doug, to be honest, I think Paragraph A was the PRA requirement. And so when we got to Paragraph B, we just said the PRA because we had just talked about it in Paragraph A, and I didn't repeat all of Paragraph A on this slide or another approach, as you're mentioning.

So I think we meant Item B to open it up as you just suggested. But when we were looking at a word and given Paragraph A was about the PRA, we just -- it seemed like a natural way to start the sentence. Nothing more complicated than that.

MR. TRUE: Okay. Yes. I just think -- to respond also to your other question or request, and this is not necessarily focused on the IAEA approach or any other approach. But we are looking at whether we can bring forward some other ideas about approaches

that we think as being into Part 53 would meet the intention of a risk-informed approach. And I think some of our comments were more hung up on the fact that it was saying that the PRA as it would itself must be used, the purpose in the prior language.

I think a more broadly based statement of a risk-informed approach for systematically evaluating safety systems must be used just because at the same basic place you can deal with it regarding uses and flexibility there might be other guidances that are envisioned and eventually endorsed for doing that.

I'm also curious that in the regulation you use the term other generally accepted as sort of a qualifier of risk-informed approaches. And the NRC also has to accept whatever method is being approved. So why did you feel like other generally accepted needed to be included in there for regulations?

MR. RECKLEY: And that also goes to we were trying to have some consistency that when we talked about, for example, quality assurance we said generally accepted to say that we were trying to get people to adopt something addressing from a consensus code and standard or from IAEA or from even another regulator is what we were hinting at there, that we were trying to reinforce that these approaches would

be coming from something like a consensus code and standard.

But I understand your point. And, you know, if somebody wanted to create something 100 percent on their own, would we exclude it? So we'll look at that language.

MR. TRUE: One of the concerns, I'll be real direct, one of the concerns I have is that PRA and tying the PRA standard, I went through the non-LWR standard. And my interpretation of it is that as a community standard, you're going to use it for these purposes. You're at a whole 9 yards Capability Category 2 PRA. That may not always be what's needed.

I mean, if you really have a design that is as safe as some of these are perceived to be, then you might be able to get by with some sort of more bounding, less detailed kind of analysis that can accomplish the risk informing piece but also not have to drag you down a deep down PRA approach.

It sort of brings me to my next question. I'll be direct with my question. But I think there was some discussion about your developing some guidance from a graded approach for the use of PRA. Can you elaborate on where that's going to show up in the process?

MR. RECKLEY: I'll let Nathan or Mo or Marty weigh in here. But my current thinking is that if we can, it would fit in through the guidance because it would still be a PRA but the guidance could be used to reflect the notion that a simple design can have a simple PRA. But if Nathan or --

MR. SHAMS: Thanks, Bill. I'll chime in, Bill. Thank you. So, yes, Doug, as Bill indicated, you know, as we were working on bravo here, that was sort of the thought in our mind as an opportunity to reflect on a simpler design would have a simpler PRA and maybe even get to the place you were describing about perhaps a bounding analysis can also demonstrate -- a conservative bounding analysis.

You've got to make sure that we're collectively, you know, clear on that particular -- you know, conservative bounding analysis because bounding analysis is a conservative analysis. That's, I mean, you know, it's by definition, and it can get us to where we need to be.

The challenge is, as Bill has been, you know, indicating it, how does that relate to the mixed parts of the rule in terms of operational flexibilities in terms of, you know, other aspects. How do those things go together? And that's the

challenge that Bill was speaking to, you know, a few minutes ago.

Is that another set of requirements in Part 53? Is that another set of requirements somewhere else? So that's kind of the needle that we're trying to thread.

MR. TRUE: Okay. I think that's doable.

MR. BEALL: Okay. All right. Can we go to Slide 82, please? There you go. All right, Cyril, we'd like to go through your slides, please. Cyril, are you there? Okay. While we wait for Cyril to come back, let's go ahead. We have some hands raised. So let's go to Frank. Are you there?

MR. SCHAAF: Are you -- Frank Schaaf?

MR. BEALL: Yes.

MR. SCHAAF: Okay. My name is Frank Schaaf. I'm a retired utility guy, and I sit on an ASME Section 11. And this has really been an interesting discussion today. And I wanted to comment about your PRA usage.

For the new reactors, we wrote a special division in Section XI, which is the operational portion of the Code. And in RIM 2, which is our chapter, we've had kind of a paradigm where basically Section XI would become effective as soon as the light

bulb goes off in the owner's head that he wants to build a plant.

And in the RIM process, which is the Reliability Integrity Management System, and Division 2, it requires the owner to do a full PRA. And the non-LWR PRA standard that the gentleman before me talked about was written specifically for Division 2, and it does require you to go in and do the full 9 yards.

When we wrote that standard -- I served as the vice chair of it -- we put in a specific section that could be used to make that standard applicable for design applications, which none of the other PRA standards had at the time.

We also, as part of the RIM program, require a consequence section to be evaluated. Now the reason that we're taking this approach to risk is that for each SSC that we were going to examine in later life or during plan operations was going to be assigned a reliability target. And basically, it would be the owner's responsibility to meet that reliability target as part of this in-service inspection program.

So we've gone away from the deterministic thing of hey, you've got to inspect, you know, 7

percent or 10 percent of the wells in Class 1 or Class 2. Now each SSC, it's not going to have a code class. It's going to have a reliability target.

And the owner is going to decide how we meet that reliability target. Now when we started up the program 16 years ago in trying to develop this thing, we were expecting the NRC to come forward with a set of goals, in other words targets or goal targets that we were to meet for the different SSCs.

And in working with the NRC, they didn't feel with the difference in technology that were coming forward that they could do that. But in listening to your discussions this morning, like with ALARA, I've got to look at your Appendix I because that might be something that we would be in Section XI very interested in is if you did put controls in there and in working with you to give you an idea of what we were looking at that could be met.

Now understanding Section XI, Division 2, is going to be in a reg guide. It's not going to be part of the regulations. You know, that would be kind of an easy thing to work with you folks on. And I guess I would encourage that your group get a copy of Section XI, Division 2, and read it.

And I think there's a lot of room to where

we could help you and you could help us. And I'm done talking.

MR. BEALL: Okay. Thanks, Frank. Okay. Cyril, I think you're back on now, right?

MR. DRAFFIN: Yes. Sorry.

MR. BEALL: Okay.

MR. DRAFFIN: And we can go to the next slide. So we will think about Bill's comment about using Part 50 because some people will be using that in the next few years in any case before 53 is available.

Because we don't agree with the safety criteria of the first tier, we don't agree with building on them in Subpart C and the same logic applies for the next section in Subpart C unless we have an understanding of what's really being accomplished in the first and second tier, building on that is a concern.

And so I think that's the main points we're going to make on this slide.

On the next slide in terms of safety and security together. The new words interdependent efforts are not defined, and we don't understand the intention of the language.

We look forward to the staff's proposals

on security. We understand that that might have a graded approach. It might be thoughtful in terms of how you deal with different types of advanced reactors with different levels of risk.

And we look forward to understanding the meaning and the rationale for the words safety and security must be considered together in the design process. And we obviously think that it's important to consider security but that the NRC ought to be regulating outcomes rather than the process.

On the next slide dealing with analysis requirements, I'll just mention a couple things and then turn it over to someone else representing one of the developers. We're concerned about how the PRA is being used in the regulation. It still starts out in Section A by saying you must have a probabilistic risk assessment and then there's a formalized PRA tool rather than a requirement to have a risk-informed assessment.

Now we recognize that Paragraph B provides flexibility on the use of the PRA as Bill elaborated on and that has merit. But understanding how that would be done in terms of the guidance that was referred to would be important to understand how that process is going to occur.

So why don't I turn it over to Dennis Henneke from GE-Hitachi, who has been really a key expert in the PRA area, to talk about this and also the next slide. So, Dennis, if you'd be willing to pick up and kind of elaborate and also answer questions that people had on PRA.

MR. HENNEKE: Sure. I appreciate it, Cyril. Yes, Dennis Henneke here with GE-Hitachi. And we have two advance reactors that are looking to come forward in the next few years. We're working with TerraPower on the Natrium reactor and also on the X-300 reactor, which is a light-water reactor.

If we can go to the next slide, I did want to, you know, reiterate that we appreciate the NRC and the staff's consideration for some alternate wording and to dialogue on some of the issues.

You know, today we have a framework. In the past, like for the ES VDBR and other reactors, the PRA was used to confirm basically the safety case, that the real risk of the reactor was sufficient and complement the safety case.

And we're moving into a new era of use of risk tools, including PRA, to change the landscape. And how we get there is being influenced by several approaches, one of which the LMP approach under NEI

1804.

But we believe there are other tools. So we appreciate the flexibility that's being considered. We also appreciate Doug True's comments earlier. I think he picked up on a few things that we want to emphasize here is the flexibility that, you know, if you have a reactor that's extremely safe or even safe with regard to a particular hazard, a particular set of events, that we wouldn't necessarily have to go into the full blown Capability Category 2 of the standard PRA in order to provide the risk information to support the license, that we need to have flexibility on that.

And so Doug's point on using risk insights and a risk-informed process doesn't necessarily mean in all cases a full PRA that evaluates all accidents in all plant operational states, so some flexibility on that.

And the additional thing we've been talking about, which brings up this IAEA approach is the IAEA approach listed there under SSR-2/1 and the associated documents associated with a safety analysis as well as defense in depth do provide an LMP like approach. That you can look at look at a licensing basis event being informed by your PRA, defense in

depth being informed by PRA and your safety classification being informed by PRA.

But you wouldn't necessarily have to use it for all three as is done in an LMP. So some sort of hybrid approach that maybe only does two of those. So licensing basis event evaluation, defense in depth but not the safety classification using the PRA results might be an approach and the IAEA approach seems to support that well.

I guess, Bill, in response to one of your comments -- the IAEA approach under SSR-2/1 talks about five levels of defense which are not barrier based -- it's not a barrier-based approach. So I'm not sure why you're thinking it's, you know, a fuel cladding reactor vessel containment kind of a defense in depth.

It's a function based defense in depth. An LMP approach under 1804 is based on the defense and depth as discussed under the IAEA approach.

So I think they may very well -- they're actually very similar. And we'll be bringing forward some of that information on an alternate to that in the next few months.

And I personally would think moving it under 53 would be advantageous simply again for the

builders. And many of us want to build our reactors outside of the U.S. That if we build it under a non-LMP approach that it's going to be more amenable to being built in other locations like we're looking into Canada for example, which directly requires meeting the IAEA guidance.

So, you know, we'll continue to dialogue on this and appreciate the staff's flexibility in this area. I'll ask --

MR. RECKLEY: Yes, Doug, if I can, Doug, and again, I appreciate what you're doing and look forward to the proposal. When I said the barrier base, it wasn't the defense in depth, which you're right, LMP actually incorporated the IAEA defense in depth model.

But it was more in the analysis part and how you look at the AAOs and the DBAs and so forth. When you get down to that level, I think the way I read it, the IAEA standards still kind of reflects a more traditional barrier base when you look at the analysis of the event and also in the safety classification coming out of that analysis.

But, again, I would look forward to any proposal that you guys can develop.

MR. HENNEKE: Yes. And the other point on

that is the IAEA is currently developing documents for advanced reactors and specifically to SMRs. And they are risk informing their safety analysis, a portion of that that's referred to in the SSR-2/1.

And I think the general consensus right now is that a reactor could not move forward under IAEA guidance without the LBEs being risk informed. And what they're trying to do is at least have the defense in depth portion of it risk-informed with the possibility of SSE classification depending on the country that the reactor is being built.

So stay tuned for additional documents from NEI coming out later this year or early next year that will take SSR-2/1 to fully risk-informed for SMRs.

And the last point on the last bullet is I believe we've talked a number of times as to, you know, we still consider the PRA maturity in the various phases of the reactor. And we continue to push the -- not require the full extent PRA, even if a reactor needs a full PRA, that is not necessarily completed in the CP stage and for what is complete in the CP stage that it not require a peer review of all hazards and all plan operational states.

And that process, we would go through that

process a little bit and figure out what's needed and when in the regulatory process.

And that's all I was going to cover on the that slide. I think I'll turn it back to you, Cyril.

MR. DRAFFIN: Okay. Thank you. The next slide, 87, I just want to touch on a couple other things. The language on contributing factor and unplanned event is unclear. We don't understand the distinction between (b)(1) and (b)(5) regarding LBEs and identifying events that challenge plant control.

And it seems that plant control and safety systems failures are two different ideas, important, but how they work together in terms of this regulation would be helpful to know.

And (g) refers to things that need to be assessed but against what? Will there be acceptance criteria? And how will essentially they be satisfied?

So I think the key comment on this section is that a little work and understanding is needed. And we certainly want to support international licensing, reactor manufacturing. If we want to change the -- have these deployed worldwide, we obviously need to have other countries involved in the regulations.

And so the more we can use approaches, the

risk-informed approaches that are useful and will be accepted in Canada and Europe and in Asia would be better.

So on the next slide in terms of safety characterization, as we mentioned in previous meetings, we don't understand the rationale for the facility safety program in Subpart F. Maybe when we hear more about what's in F in operations it will help. But for now it's that and also the next section is still confusing.

We understand the concept that's been discussed but how it's going to work and it's not clear whether the benefits of the proposed ideas will be chief or that they'll be durable. So substantial discussion is needed and written guidance, I think, will be essential in order to -- and also a direction to reviewers. It's not just the guidance but how will the reviewers respond and make these assessments in the future is important.

And the last point, an emergency planning zones, that might be able to be achieved on 50 and 52 without the additional safety margins so the benefit of this section is a little bit unclear.

And then finally --

MR. RECKLEY: Just to make sure, yes, just

to make sure that we're on the same page, when we say additional safety margins, when a designer or other party analyzes an event or analyzes the plant and shows that the worst offsite consequence is below 1 rem in 96 hours and therefore could, under the proposals, justify a reduced emergency planning zone, we call that additional safety margins because the bottom line number would be, under our current construct, the 25 rem for the DBA and the QHOs for the broader Tier 2.

And so when a designer introduces a more conservative number like 1 rem over 96 hours, that is the additional safety margin. The operational flexibility is the reduced LPZ.

So can they get that under the proposed rule currently? That's the pursuit. But we would take that as one example that we would build into Part 53 along with some of the other operational flexibilities on siting, perhaps staffing and so forth that we've talked about. So just to get the terminology correct, that's what we meant by additional safety margins.

MR. DRAFFIN: Okay. That helps. And clearly it's beneficial both for 52, 58 and 53. So that's something that would be helpful. So thanks for

clarifying that.

And on the last slide regarding quality control, we certainly support the use of quality assurance standards and particularly having the guidance delineate that here's some of the international standards that are being used. And they have been developed over a period of time. And so generally accepted is okay in this regard for QA.

And for design analysis interfaces, clarifying how would you define the state of the technology and economic improvement? Is this done once or continuously? What does it mean to consider risk reduction measures? Do you plan on providing guidance for economics improvement? Do they back fit if there's some kind of enhancement? So just clarifying what is meant by this would be helpful as you go forward.

So that will be our comments on Subpart C. And, again, we may have some additional comments after reflecting on what was presented today. So back to you, Bob.

MR. BEALL: Okay. Thank you, sir. Can we go to the next slide, please? Okay. So, Mike Keller, you have your hand up.

MR. KELLER: Yes. This is Mike Keller.

MR. BEALL: Go ahead, Mike. We can hear you.

MR. KELLER: Hi. This is Mike Keller of Hybrid Power Technologies. We have completed our homework assignment. Light-water technology, we propose a hybrid approach built on a 10 CFR 50 framework. However, the PRA forms the bedrock to establish the passive fail safe nature of the technology.

SSC classifications and QA are not linked to the PRA. These items are mechanistically created and tied to graduated nuclear safety functions.

This approach is actually detailed a lot, in very high detail actually, in the recently published book, Hybrid Nuclear Energy Systems, literally just recently published by Elsevier Academic Press.

As we had completed our homework assignment, we are asking that the NRC advise as to the fit with the intent of the proposed 10 CFR 53.

MR. RECKLEY: Hello?

MR. BEALL: Yes, hi. Thanks, Mike. Bill, do you have anything to say?

MR. RECKLEY: Yes. If Mike can send us the link to that, we can take a look.

MR. KELLER: Yes, we'd be happy. We'd be happy to. Our website actually identifies it really in more detail. But we'll send you the details on it. But it's literally just hitting the press. I mean, it's published, literally, just within the last two weeks.

So, anyway, we are hopeful that the NRC will be able to provide some insight as to the ability of this approach to fit with where 10 CFR 53 appears to be going. So we would much appreciate that feedback.

MR. BEALL: Okay. Thank you, Mike. Ed Lyman, you have your hand up.

DR. LYMAN: Yes, hi. So I have to say I'm pretty troubled by this discussion. And I'd like to point out that the NRC also has an obligation to the public that its rules are comprehensible. And frankly there's been a lot of discussion of clarity. And I feel like what's going on here is about as clear as mud.

I have yet to hear anyone define what a risk-informed approach is that does not actually have a basis in a quantitative estimate coming from the risk equation that is probability times consequences.

And I think it's a treacherous path if the

NRC allows some sort of hybrid approach where you're not dependent -- where risk-informed becomes a warm and fuzzy feeling that is not documented by technical analysis and that's what I'm hearing.

When I hear about PRAs where you don't have to actually finish the PRA because you have the warm and fuzzy feeling that it's going to be all right, that your design has some safety feature that means you don't even have to bother testing your proposition, that it's actually going to work. That's not a basis for regulation or for safety.

So, I mean, the kind of relativism that's going on here is absolutely unclear. You know, obviously there are concerns with facing these rules on PRAs when they are not well validated. But the way to compensate for that is to have a clear application defense in depth so that where you aren't able to validate your PRA, you are applying defense in depth adequately to cover that.

And to take one example is the sodium cooled fast reactor where the absence of pressure resistant containment is really based on a demonstration that the likelihood of a hypothetical core disassembly accident is indeed, you know, hypothetical were it below a certain probability.

And without that kind of analysis, I don't understand where this is going. So I would say what you need to have is either a PRA-based option or a fully deterministic option. And the applicant can choose which one.

But if they don't feel like they have the PRA that can actually do the job, then they'll have to accept the terms of the deterministic rule, which would deposit a particular source term the way Part 50 does now for light-water reactors. And the danger is trying to attribute that to some sort of maximum credible accident because if you don't have the PRA, you can't really make a statement about what's credible or what's not credible.

So you're going to have to come up with a deterministic standard that's accepted. But to have this kind of hybrid where, you know, this hand waving, where you refer to risk but you don't actually have the technical or quantitative estimate of what that actually is is not the way to go. Thank you.

MR. BEALL: Thank you, Ed. Bill, do you have anything to follow-up?

MR. RECKLEY: No. Not specifically. Again, we'll look for the proposals that Mike and NEI and in particular Dennis mentioned so.

MR. BEALL: Okay. Great. Robert Budnitz, you're up. You have a hand up?

DR. BUDNITZ: Hi. This is Bob Budnitz. Can you hear me?

MR. BEALL: Yes, we can, Robert. Go ahead.

DR. BUDNITZ: I want to make two different comments that are related. The one is I think the staff -- I'm very sympathetic with the problems the staff is struggling with. But I think part of the problem the staff is struggling with is you are trying to squeeze into Part 53 reactors that are very, very different, not just in their technology but in their size.

That is on the one hand we're talking about these -- we can call the small modular reactors, but some of them are a few hundred megawatts thermal.

And at the other end of the spectrum are reactors that are two orders of magnitude small than that, less than 10 megawatts thermal, sometimes only 4 or 5 or even 3 megawatts thermal.

In squeezing them together into this common regulation, it may result in being very unfair, which ends up being costly and unnecessary for those small ones.

And I think if you read the whole Part 53 as I've done, from that perspective there are several places where the requirements were clearly written with the, let's say, few hundred megawatt thermal modular reactors in mind and where it isn't necessary and almost transparently not necessary, although they have to make the case for the tiny ones.

So I had an approach that I wanted to recommend to you. I'm not sure where to go with this, but it goes as follows.

Maybe for some of those tiny reactors, they ought to be given the flexibility to work backwards from the consequences. That is imagine a reactor that really is so small that you can't -- I don't want to be sarcastic about it, but imagine you can't even engineer a release big enough to violate the criteria. I don't really mean that but imagine something like that. Where it's very hard to come up with a scenario that violates those.

Then if those consequences are small enough, you ought to be able to come up with those few accident sequences, if any, that really can generate the consequences that matter, work on them and the heck with the rest.

I'm being a little facetious here, but if

you know what I mean. That's where the regulatory effort and where the design effort ought to concentrate. And a whole lot of the apparatus that is brought in to regulate -- by the way, the larger LWRs that are now being brought down to regulate these few hundred megawatt thermal reactors is probably not necessary at all for such things as safety classification for a whole lot of items that just never contribute to any of those things.

And I want to make that point that your struggle to squeeze the tiny ones in with these larger ones, they're not, you know, 3,000 megawatts but they are a few hundred, may be putting that tiny category at an unfair advantage. And you ought to maybe think about how you can write these things in two different ways for those that can meet those criteria. That's my first point.

And my second point, which is related but different, has to do with external hazards. That is for some of these reactors, some of the external hazards aren't very important. And you ought to have a way to enable them to do what I'll call a demonstrably conservative analysis that shows if true that that's true. And then they ought to be relieved of a whole lot of those requirements for those

external hazards for which it's so.

Again, the comment I'm making comes down to just one perspective for it all. And that is looking at the whole thing, 53, from the perspective of reactors that are less than 5 megawatts thermal, you may find, I think you will find in several places -- I know I can point them out to you -- where you really got to write something different and give them that option if they can show it.

The burden is on them but if they can show it, they ought to be able to save a heck of a lot. That's my comment. Thank you.

MR. RECKLEY: Thank you, Bob. And we've wrote up in previous meetings. And I think we still talk about it in the discussion table that for such microreactors, we may be able to develop an approach that you're very familiar with, the ANS 2.26 and associated DOE methodology in Order 1020 to kind of look at it to say whether starting with an assessment of unmitigated consequences can you identify the challenges and would that be an easier approach and possibly an acceptable approach? And we've been kind of looking at that internally and bringing it up at these meetings to see if we can get any feedback from stakeholders.

But what you're saying is it may be possible for using the ANS standard to have seismic design Category 1 or 2 for some of these reactors. We're not sure that's true. But if it were to be true, then the process should be easier because you're basically right. We are going into this on the assumption that there are specific engineered features that are necessary to keep the doses even below the 25 rem number so.

DR. BUDNITZ: Bill, I have one more thought that I should have said three minutes ago. Thirty-five years ago, golly, it was even longer than that, a group of seismic engineers that was led by Allin Cornell and Bob Kennedy came up with a logic that became the seismic margins method which was used to understand the seismic -- this was for larger LWRs back then. It was used to understand -- how to understand those seismic margins without bringing in a whole lot of the other apparatus of the seismic troubles, which have to do with it -- in that case it had to do with the hazard and stuff like that.

And the logic that they came up, and the reason I know is that the NRC and EPRI appointed a joint panel to write that method and I chaired that. This was in 1984. And so I'm pleading guilty. It was

almost 40 years ago.

And the logic was that you can bypass certain aspects of what people always thought was important by demonstrating that another aspect had plenty of margin. In the seismic margin method, you could bypass the hazard part by showing in layman's language that all the components were strong enough.

And you could think about that in these tiny reactor arenas by thinking that the figure of merit isn't that the reactor is strong enough for that size margin but that the consequences are small enough and a whole lot of other stuff gets bypassed. Thank you.

MR. RECKLEY: All right. Thank you, Bob.

MR. BEALL: Okay. Thank you, Bob. Amir from Southern Nuclear. You have your hand raised.

MR. AFZALI: Good afternoon. Thanks a lot for the opportunity. A very interesting conversation. The staff is giving a lot of good advice about the specific language, which was proposed previously and now is proposing. I'm not going to go into that level of discretion. I just want to make some observations based on the conversations that I'm hearing.

So from an owner/operator's point of view, what we are very interested in is a commercial

viability of the reactor that is socially acceptable. So from a commercial viability point of view is this having operational and design requirement for accessibility.

So I think as we are looking into the rule, we have to look into how we can maximize the taking advantage of those additional safety margin that we're going to achieve through these new designs by getting operational and design flexibility. So I encourage the staff, keep looking at that aspect of it as they are formulating their language.

In terms of the graded PRA, I think that's really the core of any PRA, good PRA standard and a good risk-informed practice. I totally agree with all of them, Bob, Doug, Mr. True, Dennis, the grading should be based on two things.

One is the safety case of the design-based consider and the second part is the desired operational flexibility. So just as a safety case, a safety case within what framework? What are they trying to do in terms of number of operators, functional containment versus leak tight containment, size of LP zone, number of said power sources, et cetera, et cetera, et cetera.

So I would invite you to kind of look at

it from that aspect, not only the safety complexity but the desired operational flexibility.

And this conversation about Capability Category 2 requirement, I think that's really contrary to a risk-informed thought process. The way the standard works as far as -- I mean, I haven't looked at it for a while now, but the way we always use it, Capability Category 1 is the conservative analysis, bounding analysis. Capability Category 2 is really a more realistic analysis.

So if there is a safety case and the desired operational flexibility where it can be justified by Capability Category 1, we should use Capability Category 1. By its nature, by its requirement Capability Category 1 in my opinion it has to be conservative.

Capability Category 2 came into play when we were trying to do more conservative decision-making based on realistic analysis. We are trying to out-weigh situations where we are masking risk. So we said, okay, you have to do a Capability Category 2 to make sure we are trading different hazards in a right way so we are not working on some part of that and the risk of that part is covered by conservative analysis elsewhere.

So I totally agree with what Dennis said and Doug said and Bob said that Capability Category 1 if, again, your design capability or safety case simplicity makes it available and operational, joint operational flexibility makes it feasible, you want to use the capability -- allow the Capability Category 1.

And the third topic that I would like you to consider in your evaluation is we do want to have a systematic process for evaluating the design. That's a really, really important piece of the puzzle.

The other piece of the puzzle is the systematic process, a systematic and transparent process for evaluating different designs. You're comparing different designs so you don't unfurl it -- trade one design versus the other design simply because of the power of negotiation versus having a similar measuring stick to look at the margins they have and the operational flexibility that they can gain.

And then I would like to close out my comments by please look at your role in the context of all the years of lessons learned. And I invite you to read -- as one of our colleagues recently promoted a book, I'm going to promote another book. It's not written by me. It's written by an NRC historian, Mr.

Thomas Wellock. It came out, like, three weeks ago, four weeks ago, about what's safe enough, Safe Enough, A History of Nuclear Power and Accident Risk. I would invite you to look at that and see over the years how we have learned to use the quantitative risk assessment as part of our decision-making. Thank you very much for your time.

MR. BEALL: Okay. Thank you, Amir. Emma Redfoot, you have your hand up.

MS. REDFOOT: Yes. Thanks, everybody, for this discussion. And I appreciate the staff and stakeholders who have put a lot of work into Part 53. PRA is a great design and analysis tool that historically has been used in the nuclear industry in order to lower the conservatisms inherent in bounding deterministic analyses. That's what we've been hearing throughout this discussion.

PRA was accepted as a standard practice in the nuclear industry decades and millions of operator hours into the operation of the large light-water fleet, which is a fleet of designs that have a lot of active components and are large and very complex.

Many advanced reactors are simple systems with passive components. I want to reinforce Bob Budnitz and Cyril's points that these regulations need

to be performance based, which can be accomplished through means outside of PRA.

There are deterministic and more conservative approaches to a safety case than a PRA approach as has been discussed throughout this, you know, period, that the language that's currently in Part 53 eliminates as being a sufficient means of showing safety even though they are more conservative.

For example, the current language requires a PRA for external hazards, causing an undue burden for a safety case that can demonstrate safety through a deterministic approach to external hazards. This was to Bob Budnitz's point as well.

So the PRA language in Part 53 still locks in the requirement for advanced reactors to have a PRA-based safety case for their reactor designs largely. The language in Part 53 I suggest being more holistically representative of using the PRA to provide insights to a design while not explicitly requiring it for any portion of the design.

I appreciate that the recent changes to 53.450 language to include other generally accepted risk-informed approaches. But as it is currently written, 53.450 incorporates language that largely eliminates the ability to use any other approach

besides from PRA or that you at least absolutely have to do PRA. Clearly, Part A still requires a substantial PRA no matter what.

So I have a question for the staff on how does the staff anticipate added flexibility in 53.450 considering the remaining prescriptive requirements in Part A to 53.450? Thanks.

MS. VALLIERE: Emma, maybe if I could just ask you just to clarify. So the prescriptive requirements in Part A meaning the requirement that all applicants have a PRA.

MS. REDFOOT: The requirement that all applicants have a PRA and that that PRA include -- must be performed to identify potential failures, degradation mechanisms, susceptibility to internal and external hazards and other contributing factors to unplanned events that might challenge the safety functions. So that's a lot more content than is in the Part 52 requirements for PRA for example.

MS. VALLIERE: Okay. Thank you for that clarification.

MR. BEALL: Okay. Thank you, Emma. I don't see anybody else having their hands up and so can we go to the next slide, please?

So we're going to take a break here before

we get into Subpart C discussions. So let's come back at 3:45, and we will start up with the Subpart C preliminary proposed rule language discussion. Thank you.

(Whereupon, the above-entitled matter went off the record at 3:33 p.m. and resumed at 3:45 p.m.)

MR. BEALL: Welcome back, everyone, next slide, please. For the reminder of the public meeting today, we will be talking about Subpart E, Construction and Manufacturing Requirements.

So, this is the new proposed rule language that was released for this meeting and also, we'll talk about key supporting guidance for the Part 53 rulemaking.

So, Bill will start us off talking about Subpart E. Bill?

MS. VALLIERE: Bill, you may still be on mute.

MR. RECKLEY: Thank you, Nan. What I had said was before the break Ms. Redfoot had really posed a question to the staff and we didn't respond so let me first do that.

So, we will be listening to all of the comments today and obviously, there's experts, Doug True, Dennis Henneke, that were weighing in that we

want to digest the proposals, and in particular in regard to Item A under 450 to perform the PRA.

That seems like a logical fit for us, it is showing the evolution, however, as that policy was developed, as Bob Budnitz pointed out, neither did that evolution of our guidance and requirements necessarily have in mind some of the proposals in terms of micro-reactors that are now being proposed.

So, we'll look at those proposals and basically try to reach an assessment. And I'll be honest, we're evaluating and are not yet convinced that the bottom line of the PRA is what can go wrong, how likely is it, and what are the consequences, everybody's heard of that triplet.

And if there's an argument that the question of how likely is it is not material to decisions, then maybe we can propose that.

Or another way, I don't want to exaggerate, can you address that question in a way that is less onerous than a PRA, then we're going to look at that, so we'll await some of the feedback from people.

But based on our experience, it's difficult to imagine where at least the question of how likely is it is not a material question.

But I don't want to foreclose on anything, whether an approach can come up with a method where that question isn't relevant or there's another way to answer the question, then we'll be amenable.

And we'll relook at Paragraph A to see if maybe it could provide an alternative to a PRA and just assess a more generic risk assessment method. So, we'll wait and see as we get some feedback from stakeholders, but let me then delve into Subpart E again.

I want to catch us back up if I can, I'm not sure a lot of people have had a chance to look at this subpart.

I don't believe it's very controversial, it may have some level of detail, comments that we would get in terms of how we've constructed it, but I'll just go through it.

So, if we go to 93 and 94, the layout that we have here is that we're trying to address within Subpart E construction being the more traditional power-plant model of an assembly of a reactor at a site, the fueling of the reactor then once it's completed in preparation for operations.

To the degree it has modular components that are delivered, that's still construction to us.

The second segment of Subpart E is related to manufacturing and that's one we have some specific questions, and so I wanted to get to that relatively quickly.

So, the layout of the construction part, if we go to 95, this just gives the applicability and the scope of this subpart. It is intended to address construction permits, combine licenses, manufacturing licenses or limited work authorizations.

If we go to 96, the construction section is laid out with some basic requirements on management systems and control systems. And then we can go on then to 97, let me see, I'm sorry, I did one step back on 96.

Much of this section is associated, as one might expect, with quality assurance and much of what you will see in there as a first iteration is the existing quality assurance requirements, either taken directly from or paraphrased from Appendix B to Part 50 on QA, looking at the different criteria, picking out the ones related to success, which tends to be most of them.

And you will see, basically, I think almost all of the criteria from Appendix B reflected in the QA requirements for construction.

Now, I'll go on, if you would, to 97? Thanks. So, then there are procedures, requirements for procedures, inspection and acceptance, again quality assurance, quality control kind of measures, and some communication requirements.

So, people read through those, to the degree anyone wants to give us comments or observations, all of the mechanisms that Bob mentioned are available. We'll hear some in today's meeting but emails or other things, if people want to give us feedback.

What we're more interested in just to understand what Part 53 might need to address is in the area of manufacturing so if we can go onto Slide 98? The layout of the manufacturing section under 620 is basically the same in many of the areas as construction because it basically is trying to address the same requirements.

There's a need to have management and quality assurance within the manufacturing facility. There will need to be controls and we need to consider even things like fitness for duty extending into a manufacturing facility.

To the degree that the manufacturing facility is going to include loading fuel, then that

will also bring in all of the controls for handling special nuclear material, radiation protection security, and so forth.

So, that's one of the reasons we're so interested in whether this manufacturing approach to the development and deployment might include things like loading fuel because that will have a large impact on what we need to try to address within this section and then the licensing parts in Subpart H.

So, if we go onto 99, bringing in largely the same requirements that are currently in Subpart F to Part 52 on manufacturing licenses. There will be a need to conform to whatever codes and standards, obviously there will be a need to conform to the actual manufacturing license.

There would need to be procedures in place, again, in terms of radiation protection, potentially emergency planning, and so forth, if there's going to be the loading of fuel for a particular manufacturer module.

And now if we go to 100, this is where we start to get into some of the questions and the desired scope and what we would need to address within Part 53. There will be a communication aspect just like there was for construction.

Again, going to if the plan is to load fuel at a manufacturing facility, not only would we need to address the interfaces with regulations such as Part 70, but also Part 71 on transportation.

And then ensuring that there's procedures in place and that the current plan as we're developing this is that as in Subpart F to Part 52, the manufactured unit has to go to a licensed site, either one with a construction permit or a COL.

We're not currently looking to deviate from that to address, for example, what might truly be called a mobile reactor that would move from site to site.

So, again, if that's a potential interest then we would need to step back and not only assess our regulations but we might also need to like to whether that's even permissible under the Atomic Energy Act as it's currently written.

But for now, we're not taking that on because we're not including that in the proposed scope of Part 53.

And then the last bullet there, a large consideration for the transport and disposal post operation and in preliminary talks with our transportation folks it's not currently clear that

we'd be able to address that without changing Part 71.

Again, that's not necessarily saying it can't be done or we can't address it, it just expands the scope to say in addition to developing Part 53, upgrading the manufacturing license, technical requirements, and then when we get the Subpart H, updating the licensing components per manufacturing license, the biggest question is the desire for us to address the loading of fuel at the manufacturing facility, the transport loaded with fuel.

And then potentially the need to transport it post operation.

So, that's the primary questions, we've had some discussions with other agencies and so forth so we're starting the process to try to develop some of this but this was an opportunity to actually hear from stakeholders on what they would like to see us try to address in Part 53.

So, with that, Bob, I'll turn it over. I think Nick has a couple of slides.

MR. BEALL: That's correct, can you go to the next slide, please? Cyril, you're up.

MR. DRAFFIN: Thank you. I have three comments on construction and a couple comments on manufacturing and I'll turn it over to Steve

Schilthelm from BWTX who will give you some more details on the manufacturing side.

So, on the next slide we had just pointed out that in February the Part 53 meeting had a discussion on the construction permit applications. There was a series of comments that were put in, some directly relevant and some for background.

And they were just wondering when NRC will take that white paper and the stakeholder comments and when that will be reflected in future iterations of this subpart E, and if so, how and when would that occur?

The second point on construction would be some of the manufacturers and developers, like let's say Natrium, has the idea of a nuclear island and a non-nuclear island.

And so the construction probably needs to address those things, which are safety-related, nuclear, and those were just common building practices.

And so distinguishing that might be helpful as you go forward. And then just to clarify, you're going to be using QA a lot and you referred to the general acceptance standards, so I assumed you referenced Appendix B as just one of them.

It's not going to require Appendix B if there's other standards that would also be relevant for construction. So, that would be my comments on construction.

On manufacturing, two points before I turn it over to Steve, the first is I think there certainly will be some developers who are talking about loading fuel at the factory and they'll have to consider safety and shock, seismic shocks, when they're shipping.

So, that will be important. You made the comment that mobile reactors may not be used, however, I think the Department of Defense plans on looking to the NRC on advice for their mobile reactors.

And so therefore, I think you will be called upon to provide input to them so whether it's in Part 53 or another mechanism, I think that will be a coming attraction on how you could assist at least the Department of Defense in their mobile reactors.

So, with that, let me turn it over to Steve for some more detailed comments from a company representing the industry that's actually going to have to make this work.

MR. SCHILTHELM: Yes, good afternoon, can you hear me okay?

MR. DRAFFIN: Yes.

MR. SCHILTHELM: Okay, great, so my name is Steve Schilthelm, I'm with BWXT and I would say BWXT has a somewhat unique perspective on this because out of our manufacturing facilities in Lynchburg we actually fabricate and deliver fully fueled reactor components and reactors today under our current NRC authorization.

So, with that in mind, we engaged with the stakeholders within U.S. NIC. I can't emphasize enough that this is, as the slide says, our initial impressions, and I appreciate what Bill said in his slides and the draft content that they sent out indicates that there's been a comprehensive thought process about all of the things that might need to be addressed.

So, I'll offer some initial impressions and these are all areas for further discussion, and I think as we go forward with the NRC Staff we can make some good progress here.

So, I think our initial impressions go like this, we think the focus of the Part 53 manufacturing license should really be on the ultimate reactor safety and security.

We think it's important to allow the

current I say Part 70 licensing process to address the manufacturing process and facility safety.

Part 70 is a comprehensive regulation that invokes Part 73, 74, 26, all of those things that go into making the manufacturing process safe and secure.

And likewise, we think Part 71 does the same for actually transporting a fueled component or fully fueled reactor, both of which we do today.

So, those two regulations can support the manufacturing and the transportation, but what they don't support, obviously, is the ultimate reactor safety and security.

And in our view, that would be the role of Part 53. So, why do we say that?

We've got a long history of experience with manufacturing process and Part 70 and the evolution of Part 70 and the implementation of the upgrades to Part 70 back in the late '90s and early 2000s.

And as you look at some of the things that Bill described, they really go to the safety of how you manufacture something, not the ultimate safety of what you manufacture in execution.

It would be very difficult to pull comprehensively all of those requirements back into

Part 53 space.

Having said that, the question comes up, do you need two licenses, a Part 70 license for fabrication and SNM handling, and then a Part 53 license for licensing the reactor itself?

Possibly, that's an area for discussion. My instinct on that is that if you tried to put it in one license, you'd just end up with one license with two pretty distinctly separate parts, but that's an area for discussion.

So, what does that leave for Part 53? We really think Part 53 will address those unique manufacturing aspects that contribute to reactor safety and security. Things like have you designed it for fabrication and transport?

There are different shocks and different loads introduced to the reactor when you transport it than maybe with a field-assembled reactor, factory acceptance testing.

So, do you bring certain ITAAC-like requirements back into factory acceptance testing? And then that post-transport inspection to make sure that the reactors arrived safely and can be put into operation.

But those are just some examples of the

things that are important to operating the reactor but not necessarily important to the safety of the manufacturing process in the factory?

So, we think it's important to consider that line of demarcation between what's currently satisfactorily covered in Part 70 and 71 and the other incorporated references to those in what really needs to be covered in Part 53.

So, if you'd go to the next slide? A little bit redundant, focus of Part 53 is on reactor safety so it doesn't perturb or confuse the current licensing of a reactor with a supplier who actually delivers an assembled reactor, which is what BWXT does today.

And it may be necessary to distinguish between a manufacturing vendor who builds to print and a developer or designer who also intends to be a manufacturer. Those are somewhat two different things.

And today, BWXT is a build-to-print shop, our customers inspect the quality of our product, we build it to a specification, but in the future, with BWXT as a developer, we might be both the design authority and the manufacturer.

Similar to Part 52, we want a Part 53

manufacturing license that results in design and delivery finality so an FSAR and an SER, that can be used downstream by a COL, similar to what Bill said.

And I think there might be some benefit to some focused dialog between your team, Bill, the MMSS and the NMSS folks and maybe even some of the current Part 70 licensees to understand what's currently authorized and avoid encroaching on what's currently authorized to be done, but cover those things that are important to be covered in Part 53.

So, with that I'll conclude. Again, it's an area for further discussion and dialog and I'll emphasize again, these are our initial impressions as an industry and we vetted them with U.S. NIC.

They have not been broadly vetted with other entities in history. So, I'll conclude right there, thank you.

MR. DRAFFIN: Thanks, Steve, so that concludes the U.S. NIC presentation on manufacturing and construction. We wanted to lay out some ideas for you to think about as Bill has requested.

MR. BEALL: Okay, thanks, Cyril, thanks, Steve. Marty, does NEI have any comments on Subpart E?

MR. O'NEILL: Not at this time, unless

Doug True wishes to add something? I do appreciate the insights from Cyril and Steve. I think we're still evaluating Subpart E but a lot of those observations do certainly make sense to me, especially your trying to leverage Part 70 and 71 requirements that now exist.

I think the only other thing I would add is if the NRC does perceive a need for some legislative changes, we would certainly want to be engaged on that as quickly as possible. So, thank you.

MR. BEALL: Thank you, Marty. Next slide? Does anybody have any questions for the NRC Staff? I don't see any hands raised right now.

MR. RECKLEY: While we wait, maybe I can ask Steve and Cyril a question.

One of the things, just a subtle point perhaps, that we had put into the preliminary language was the notion that a manufacturing license might extend to multiple facilities to support a manufacturing process that would include maybe building components under the manufacturing license at different factories, if you will, and then maybe assembly at one factory.

But having the manufacturing license

extend to other facilities, is that needed? We didn't have any input on that, it was just kind of a hunch that maybe that would be useful.

MR. SCHILTHELM: So, Cyril, I'll take that on but we haven't vetted that with the industry so I'll comment on behalf of BWXT in that space.

It's an interesting concept, Bill, I think if the manufacturing license is focused on the safety of the reactor and safety of how it's done in each facility is left to, say, the Part 70 license, it might not be a stretch to extend that manufacturing license into multiple facilities.

It simply extends the NRC oversight program for the reactor safety down into possibly multiple facilities, and may extend even some of the ITAAC-like inspections that would demonstrate that the system was safely fabricated down into multiple facilities.

But that doesn't seem like something that can't be overcome. As an example, today, although we're not a manufacturing license and we're not a design authority, our customers inspect our products in multiple facilities.

So, whether that be a research reactor customer or our naval reactors customer, they extend

their oversight of us as a supplier into multiple facilities.

So, it seems like something that could be accomplished but that's just my initial thought on that, Bill.

MR. RECKLEY: Thank you, and by the way, the general discussion that you had is the way we envision this. The manufacturing license is that thing that's referenced by ultimately the operating license or the combined operating license.

And so it's focused on the safety once the unit is deployed. We are still, as you mentioned, trying to figure out how that would play at the manufacturing site in concert with a Part 70 license and all of the things that are associated with it.

So, yes, we're just at that preliminary stage too and your insights were very helpful. Thank you.

MR. DRAFFIN: One thing I might add, this is Cyril, some of the companies, particularly some of the smaller micros, really would like to make hundreds of these in terms of manufacturing.

And they would like an efficient supply chain which is cost-effective and so, therefore, having an NRC program that ripples down to their

suppliers that may not be used to it at cost may not be a desirable path for them.

So, I think it's something to consider and it may depend on the size of the reactor, how far down off the manufacturer rather than the manufacturer buying things, components, and then assembling them.

And that assembly process and QA on the materials they have in the manufacturing is the spot where NRC puts their attention.

So, I think it may vary from how many of these reactors are going to be made and it's probably going to vary between the first of a kind, when the first 2s and 10s, and maybe if they get to 100s.

And so one of the things to consider is regulations that consider not just the first view but if they're successful when there's a large flow of them.

MR. RECKLEY: Right, and that always was the notion of the manufacturing license, was to better support that.

And ultimately, that decision is what to incorporate in the manufacturing license and what responsibility a manufacturer would have to do their own testing, receipt, inspection, and all of that stuff would really be up to the Applicant to decide

how they wanted to distribute that.

Okay, this was very useful --

MR. SCHILTHELM: Bill, this is Steve, if I could offer just one more observation?

If you think of delivering fueled reactor components or unfueled reactor components, for a supply chain, an actual supplier, you're really just building to spec and you're conforming to your customer's requirements and they have oversight responsibilities and they flow down things like Part 21 requirements, et cetera, et cetera.

The real difference with the manufacturing license, and maybe I'm being redundant here, but the real difference is that the manufacturer is also representing the safety of the ultimate reactor in an FSAR.

So, maybe that was redundant but I just wanted to make sure that was clear from our perspective.

MR. RECKLEY: Okay, very good, thank you. If there's no other questions I think we can move on?

MR. BEALL: Yes, I'd also like to reiterate what Bill was saying about supplying comments on Subpart E.

And in fact, any other topics we have

today in that if you remember at the beginning of this meeting I did put in a link, if you look in the MS chat window, of how to submit comments on the Part 53 rulemaking via regulations.gov and other methods are there also.

So, we are always looking for feedback on Subpart E and any other topics we have here today. So, with that said, can we go to the next slide, please?

Okay, now we're going to talk about the key guidance related to Part 53 and Nan is going to lead that effort. Nan?

MS. VALLIERE: Thank you, Bob. In the next few slides I'm going to discuss those areas where the NRC Staff believes key guidance will be needed to support Part 53.

This is the same information that the Staff presented at the March 17th meeting with the ACRS Subcommittee on Future Plant Design.

We told the Commission last November that the 2024 rulemaking timeline would necessitate focusing on developing the proposed rule as the first objective and that the NRC may need to publish the proposed Part 53 rule for public comment before completing all of the draft supporting guidance for

some portions of the rulemaking.

So, with this next set of slides, we are attempting to identify the key guidance needed to support Part 53.

We recognize that some additional guidance may be needed for certain technical areas or certain technologies and the Staff is seeking input from stakeholders on their interest in providing input to the development of guidance to support the rulemaking.

Next slide, please. The Staff has not identified the need for any guidance document to support Subparts A or B or the rule to date.

Of course, we do plan to provide additional explanation of the safety criteria framework in the statements of consideration that will accompany the proposed rule.

For Subpart C we have already developed guidance in Regulatory Guide 1.233, which endorses industry-developed guidance and NEI 1804 for a technology-inclusive, risk-informed, and performance-based methodology to inform the licensing basis and content of applications, otherwise known as the Licensing Modernization Project.

In addition, the Staff is currently reviewing the recently issued (inaudible) of the URPRA

standard for endorsement in a trial use regulatory guide.

We have also been working on guidance in the form of new ANS and ASME standards, for example, in the area of high-temperature materials and have been working on guidance in the area of fuel qualifications.

We also issued a Regulatory Guide 1.232 on the advanced reactor design criteria in 2018. The Staff thinks guidance may also be needed to address the application of safety margins to gain operational flexibility, an area that has received much discussion today, and also for the treatment of chemical hazards within Part 53.

In Subpart D, the Staff has been working on guidance update in a number of areas including population-related citing requirements and external hazards.

Although the NRC has received a fair number of comments on this subpart, we haven't identified anything we think would require new guidance at this point in time.

Next slide, please. Regarding Subpart E on construction and manufacturing, as we have just been discussing, the two key areas where the Staff

believes guidance will be needed are in the area of manufacturing and in the area of quality assurance alternatives.

Regarding the Subpart F requirements related to structures, systems, and components, in addition to guidance we have in Regulatory Guide 1.233 and NEI 18.04 in relation to the classification of SSEs, we believe additional guidance may be needed in the areas of technical specifications and special treatment.

We also think some guidance may be needed in the areas of maintenance repair and inspections of structures, systems, and components.

Regarding requirements related to personnel, you heard today about the white paper and the planned guidance on risk-informed and performance-based human system operation.

The Staff believes that additional guidance may be needed for the development of Applicant's concept of operations also discussed earlier today.

In the area of operational programs, guidance on emergency preparedness is being developed under the ongoing rulemaking in that area. In addition, as was discussed earlier, we are developing

guidance under the ARCAP program in the area of radiation protection.

As far as additional guidance that may be needed, if there are any new proposals developed in the area of emergency preparedness, those would likely need accompanying guidance.

In addition, there will be guidance needed for any new alternatives in the security program area as well as guidance for implementation of the facility safety program.

Next slide, please. As we've mentioned previously, the staff is uncertain whether requirements for decommissioning will be included in Part 53 and so we have not yet identified the need for guidance in this area.

In the licensing arena the Staff believes additional guidance may be needed for manufacturing licenses and if pursued, for a conceptual design review process.

Also, under Subpart I, guidance will likely be needed for a change process, similar to 10 CFR 50.59 and perhaps in the area of updating licensing basis documents such as the final safety analysis report and PRA.

And finally, with respect to

administrative requirements, guidance may be needed in the area of reporting requirements and in the areas of financial qualifications and liability.

Next slide, please. One way to visually represent areas of possible guidance needs is this graphical representation of the various elements needed to support the licensing of a facility, along with how some of those elements relate to the ongoing activities under the TICAP and ARCAP efforts.

The smallest of these ovals represents the elements of the safety case being addressed by the TICAP effort, those are the elements that are supported by the guidance under the Licensing Modernization Project approach documented in NEI 18.04 and Reg Guide 1.233.

The next slide's ovals depicts those elements that would be covered in the remainder of the safety analysis report and are being addressed under the NRC's ARCAP efforts.

The next oval identifies the remaining elements of a licensing application, those that lie outside of the safety analysis report. And the largest oval encompasses those elements supporting licensing that are expected to be available for audit and inspection.

The last thing to note on this graphic are the highlighted items. These represent elements that have some link to the Licensing Modernization Project approach and TICAP efforts, although they are outside the scope.

I'm sorry, they have a link to the Licensing Modernization Project process but are outside the scope of the TICAP efforts.

In closing out this topic, I'd just like to note once again that the NRC Staff is seeking input from stakeholders on their interest in providing input to the development of guidance to support the Part 53 rulemaking.

Next slide, please. And now we'd like to turn the floor over to NEI to provide any comments they have on guidance development for Part 53.

MR. BEALL: Okay, Marty, are you there?

MR. O'NEILL: Yes, this is Marty O'Neill. Again, I think it would be more appropriate for me to defer to Mark Nichol upon his return. I would say that we certainly do stand ready to assist in developing guidance that's essential to implementing Part 53.

I'm aware of some efforts on NEI's part related to this QA guidance. I think something is in

the works there as well as security and safeguards.

We've certainly been involved on the PRA front with the Staff's drafted white paper relating to how a PRA might support the non-LWR reactors. I think we provided feedback on that paper when there was a recent meeting on that.

Victoria Anderson is the NEI lead. I think other topics that we've identified as potential interests from a guidance standpoint could include reporting, requirements, that's a possibility, and obviously, the licensing process.

Annual fees is something that we've weighed in on in terms of the fee structure and how it should be tailored to non-LWR technologies and associated power levels.

So, I'd say at this point Mark can probably provide some additional insights on his return. Thanks.

MR. BEALL: Okay, thank you, Marty. Next slide. Cyril?

MR. DRAFFIN: Thanks, this is Cyril Draffin from the U.S. Nuclear Industry Council. We are pleased that the NRC prepared this summary document on guidance.

We had requested in previous meetings that

coming up with a list like this would be very helpful so thank you. And we also suggested that there should be references to what other parts would be carried along with Part 53, in other words, whether it's Part 20, 71, 70, just a master list of what parts would be, as far as the NRC is concerned, also required for an Applicant in addition to Part 53.

So, there has been discussion among the Staff, they mentioned maybe a few of them, but I think a longer list such as was done for guidance would also be helpful, just so strictly an outsider can see the whole panoply of requirements that are required in addition to Part 53.

As far as the particular guidance, it would probably be helpful to put in some sense of timing for the ones that haven't been completed. Would they be done a year from now in draft?

You certainly would try to get them done by the time there's rules done but to some sense of -- and it could be certainly a range of dates as a mental target for now that you, of course, would iterate might be helpful.

In terms of what was missing, we do think guidance is needed on defense in-depth.

There was some reference today to how

inherent safety characteristics would be considered but if there was going to be a guidance on defense in-depth, different types of reactors, different loads, what would be the acceptance criteria if you did a defense in-depth analysis?

I think a guidance in that area would be helpful and needed. And we've already talked about the PRA and IA approach and other risk-informed assessments. I think that needs to be fleshed out, it sounds like it's in guidance.

So, I think there's a few other areas like that that guidance would be the appropriate way to go and should be added to the list.

In terms of what you've already disclosed, I think it's good to have quality assurance, technical specifications, concept of operations, especially for micro-reactors, on a security program and the application of analytic margins. That all makes sense.

But in addition, I think it's important to provide direction to the Staff reviewers to allow flexibility by an Applicant. In other words, different view approaches should be emphasized as the NRC develops the guidance.

So, it's a combination of the rules, the

guidance and the way the Staff does the analyses of the application.

So, all three of those are important and providing more details on what kind of guidance could or should be provided would be helpful to understand how the rules and the guidance would be implemented by NRC Staff in the future.

So, as you think about guidance, you might expand the horizon to think about the other parts as well as guidance to the Staff reviewers. Thanks.

MS. VALLIERE: Thank you, Cyril. Just one item I wanted to mention, the item you mentioned about coming up the master list of other parts that are going to be addressed.

I do know that we've heard that comment before so we'll take that as an action item and recognizing that as we develop the future subparts, especially Subpart F, that list may be a living list, so to speak, as we identify more areas that perhaps we hadn't thought of at this point in time but we can certainly get that list started.

Thank you.

MR. DRAFFIN: That would be helpful and you might even distinguish if there's certain parts of a part, if you will, or subparts of the relevant

portions to distinguish them.

Or maybe wide as you're reaching to us so rather than just a list, why you're reaching it to be two columns just to clarify the relevance of each part. So, that would be great.

MS. VALLIERE: I understand, thank you, Cyril.

MR. DRAFFIN: That's all I had.

MR. BEALL: Okay, thank you, Cyril. Next slide, please. We have one hand up, Mr. Kadambi?

DR. KADAMBI: Hi, this is Prasad Kadambi, can you hear me?

MR. BEALL: Yes, sir, we can.

DR. KADAMBI: Okay, I was looking to see when Nanette was presenting her list of guidance documents whether the guidance for performance-based regulation, NUREG/BR-0303 would be on the list?

And it didn't appear to be there and yet, throughout the day there has been mention of a performance-based approach being used in a a whole lot of different subject areas.

I'm just wondering what is the role of NUREG/BR-0303 and whether there's any other guidance available or being developed for performance-based approaches as a general framework?

Because the NUREG/BR-0303 provides a framework.

MS. VALLIERE: Thank you, Prasad.

Yes, I am not aware of any new guidance being developed in that area, and I will say that most certainly, we recognize that our first attempt at this list would probably fall short and we would most certainly miss some things.

Especially in the areas where guidance already exists, so yes, we most certainly did not try to go back and capture everywhere where there's an existing guidance document that could also support Part 53.

The list was meant more to reflect those areas where either new guidance was being developed or needed to be developed.

So, I very much appreciate your comments and we most certainly recognize that existing long-standing guidance on performance-based approaches, so thank you for bringing that to our attention.

DR. KADAMBI: Thank you.

MR. BEALL: Okay, are there any other questions on key guidance? I don't see anybody with their hands up. Okay, can we go to the next slide, please?

Are there any questions or final comments the public would like to ask the NRC Staff on any of the topics we talked about today?

MS. VALLIERE: Bob?

MR. BEALL: Yes.

MS. VALLIERE: This is Nan. So, in the absence of other questions, I just wanted to make a final comment related to the discussions we were having earlier.

This gets back to Bill's homework assignment and I guess I'd like to add to the homework assignment.

So, I think they'll ask folks to consider whether some of the scenarios that were being developed and comments that were being made, whether they could be accommodated in revisions to Part 50 rather than in Part 53 itself.

And I'm reflecting on comments that I've heard from several stakeholders today, I believe it was Nico that said that he thinks that Part 53 can be written as a performance-based rule to accommodate all licensing approaches.

So, I've thought about that comment and then I also very much appreciated Amir's comments about thinking about a graded approach to PRAs,

looking at two aspects.

So, both the approach used to develop the safety case but also what you want to get out of the regulations in terms of operational flexibility during operation.

And so I would just ask stakeholders when they're considering Bill's question to think about both those aspects and if stakeholders do believe, truly, that all approaches can be accommodated within one rule in Part 53, I ask that you also consider what would Part 53 look like in that regard?

Do you think it would result in a rule with a multi-pronged approach or multiple paths, depending on which type of approach you took to develop your safety case?

So, that was the only comment I wanted to make, to just maybe broaden that thought process. Thank you.

MR. DRAFFIN: This is Cyril, just a quick reaction. If you had the safety criteria that would apply to all reactors, that would be appropriate.

And as long as you allow the flexibility that different approaches can be taken, because you may have -- for example, a micro-reactor is going to be different from others.

So, I think you have to build in that people may take different paths and so it's more the implementation side than it is the actual criteria.

MS. VALLIERE: I would agree, Cyril, in one respect. I would say that particularly what I'm thinking about is how would each approach demonstrate safety margins to gain the operational flexibility they seek?

So, that's where I'm going with that question.

MR. DRAFFIN: Okay, thank you, we will consider it.

MS. VALLIERE: Certainly.

MR. TRUE: This is Doug True, I think Ellen's is a good one and we're beginning to work on that framework to see how you might take different approaches and fit them in.

I don't think it necessarily requires a complete revamping entirely but maybe more how it gets implemented mainly to different guidance or additional guidance.

And I think the challenge of thinking about it both in terms of licensing and operation and what you get out of that is if there is one, we'll make sure we address it.

Thank you.

MS. VALLIERE: Thank you, Doug.

MR. BEALL: Yes, thank you, Doug. Nico, I see you have your hand up?

MR. McMURRAY: Yes, hi, everyone. I appreciate the statement, Nan, and I think it is a good challenge, as Doug said, to really try to think of some of these.

And if you go back a couple slides where you laid out the different guidance pieces that would discuss or be applicable to the different subparts, I think that's where you can see where you listed NEI 18.04 in Reg Guide 1.233 as applicable guidance to meet Subpart B.

And so that's one method, that's one framework to help you meet whatever those performance-based requirements are in Subpart B. So one of those other ways that you could do that and then making sure the high-level requirements in Subpart B would be amenable to those different things.

And that's where having that clear delineation, and again, how you do that is easier said than done. But that's the thinking of NEI 18.04, they could be one way, recognizing that NEI 18.04 was written for Parts 50 and 52 so maybe what changes

there would have to be, I don't know.

And so trying to think through those different ways from an IAEA approach or a graded PRA approach or an accident-credible accident or something else, that's I think where I've landed of, again, those are different processes.

And then the last step which we haven't talked about is how does an Applicant in the NRC actually engage to come to an agreement on those processes in how the review is actually done?

So, again, I appreciate the comments, I think a lot more to think about as we keep moving forward and, yes, thank you to the Staff for your time today.

MR. SEGALA: This is John Segala, can you hear me?

MR. BEALL: Yes, John, we can hear you.

MR. SEGALA: I just wanted to add to what Nico said.

I think one of the things when you implement LMP and you populate all of the event sequence families on the frequency consequence chart, and you can bear that against the curve.

You can see visually how much margin there is in the design between where when you plot the

frequency consequence for each family on the curve and you see how far it is away from the curve.

And then when you through the process go in and look at what's keeping me in that safe condition, it's a methodology for identifying the margins. And so I think what we're trying to do in Part 53 is then implement the Commission's guidance and allow you to trade off the margins for the flexibility.

And so I've heard the discussions and I hear Nan asking for how are these other approaches going to identify the margins? But I'm not hearing from industry the understanding of that question.

I don't know if I made that clear in terms of trying to understand where we're trying to take things, and then understanding how alternate approaches could still get you the same information that you could then use to trade off the margins.

MS. VALLIERE: Thanks, John, I appreciate that help.

MR. BEALL: Amir, you have your hand up?

DR. KADAMBI: Thanks again for giving me this opportunity. So, again, I'm looking at it from the point of view of how does an owner-operator benefit them most from this Part 53?

So, one part of when you look at the lifecycle is the reactor oversight process. So, we have over the years learned very painfully sometimes that not having a risk-informed performance-based oversight results in unnecessary expenditure or resources by both the industry and the NRC.

So, I would suggest that part of your deliberation, the Staff deliberation, you look at that oversight process including the oversight process during the construction.

As we know, there's a significant conversation about CP two-phase licensing versus Part 52 and one of the reasons typically brought up for issues in Part 52 is the challenges in the ITAAC arena. So, how do we risk-inform ITAACS?

And how do we make them technology-inclusive? So, when we talk about the holistic and integrated risk-informed real framework, I think we can look at all aspects, whether they're design requirements, personnel requirements, or oversight requirements.

I think that holistic approach and treating every design using the same concept and measure them against the same set of targets. So, that is a request from my end that as you're looking

at all these different approaches, consider that part of the holistic and integrated approach.

Thank you.

MR. BEALL: Okay, thank you, Amir. Mike Keller, you have your hand up?

MR. KELLER: This is Mike Keller.

The additional margins that we're talking about, it goes beyond having more than just additional operational flexibility. It goes into design, manufacturing, construction, QA, and operations.

So, all of the reasons benefit from having additional safety margins and I think that's part of the challenge with 10 C.F.R. 53 is embodying that kind of additional margin to helping out the efforts in these major areas.

Basically, we're talking about cost reductions so this goes well beyond additional operational flexibility.

Thank you.

MR. BEALL: Thank you, Mike. I don't see additional hands. Oh, maybe, Kalene Walker, you have your hand up?

MS. WALKER: Yes, can you hear me?

MR. BEALL: Yes, ma'am.

MS. WALKER: Hi, I was wondering, I'm a

little bit familiar with the Part 72 with the storage of the nuclear waste and I noticed that the NRC makes numerous exemptions to ASME codes.

I'm wondering if you're planning to follow other codes or whether you're just making the NRC the high authority on all these regulations?

MR. RECKLEY: Within our development of Part 53 we will, wherever we can, try to take advantage of standard development organizations and their development of codes and standards.

Ultimately, the NRC either accepts those but it's a conscious decision when we do, or we take exceptions to them, or we develop our own requirements.

So, ultimately, I guess it's the latter in your list there. For those things that come under our regulatory control, we ultimately decide.

MR. BEALL: Okay, thank you Bill and Kalene. I do not see anymore hands raised so before we wrap up this public meeting today, Robert Lewis, he's the Deputy Director in the Office of Nuclear Material Safeguards and Security, he would like to make some closing remarks. Rob?

MR. LEWIS: All right, thanks, Bob. It's been a very long day so I'm going to try to be as

brief as I can.

Rob Taylor, myself, and Mark Lombard are the three NRC senior managers that serve on the Advisory Committee that's been working on Part 53 with the Work Group and Steering Committee.

We thank you all for your attention on this long day and really want to thank you for freely sharing so many great thoughts. Today we covered a tremendous amount of topics, the tone of your comments I thought universally was very positive and constructive.

And it's going to be very helpful for us going forward.

We all truly believe at NRC that through the input we're getting from as many stakeholders as possible, whether it's industry, trade groups, non-governmental organizations, the public, the ACRS, we need all of those thoughts to enable us to make the best decisions on Part 53 and deliver the best product to the Commission.

As Andrea said when she opened the meeting, we're committed to technology-inclusive, risk-informed regulatory framework on the Commission-approved schedule.

That will cover the full range of reactor

types being contemplated.

We're also using the Commission Advanced Reactor Policy Statement in the NRC's principles of good regulation to guide everything we're doing. And to do that we have developed the approach that you saw today of releasing preliminary rule language to facilitate early discussion.

And as Andre said, it's just that, it's preliminary rule language to facilitate discussion and we have and will continue to adjust the rule language as we get your feedback and ultimately make our best proposal that we can to the Commission to fully inform their decisions.

I just want to end with a note, Steve Schilthelm today had a callback to the development of Part 70 Subpart H that really caught my ear and brought a smile to my face. That was in 1999 I think, well, I know it was then.

I was there with Steve across the table then so we used there a similar process to share draft language and I think from NRC's side it worked very well to integrate success.

And I think the stakeholder feedback we've gotten was similar so hopefully we can reproduce that, and thank you, Steve, for bringing that memory back

today.

So, with that, I just want to end by saying thank you all and have a great night. We'll talk to you all at the next meeting.

MR. BEALL: Okay, thank you, Rob. Next slide, please. This slide provides an overview of the current Part 53 rulemaking schedule.

As you can see on this slide, we are still in the first milestone where the Staff are performing public outreach meeting with the ACRS and working on the draft proposed rule package.

The Staff has 12 months to complete these activities before the draft proposed Part 53 rule package is submitted to the Commission in April of 2022.

The Staff is still projecting that the Part 53 proposed rule will be published for public comment during the month of October 2022.

Slide 117, please. The Staff will be hosting additional public meetings each month. We are proposing to hold the next meeting on the first Thursday of every month with our next public meeting tentatively scheduled for May 6, 2021.

These public meetings will cover additional topics and will include the release of

additional Part 53 preliminary rule language.

The Staff will continue to post all preliminary proposed rule language and any comment submittals received on the preliminary rule language on regulations.gov under docket ID NRC-2019-0062 prior to the public meeting.

The Staff is also meeting with the ACRS Future Plants Subcommittee to receive feedback on the Part 53 rulemaking. The next meeting with the ACRS Subcommittee will be on April 22, 2021.

Additional ACRS meetings will be held every month.

Next slide, please. If you have additional input or suggestions for future topics related to the Part 53 rulemaking, please send an email to Bill and I at the email address on this slide.

Your interest and comments will improve our rulemaking effort. I also encourage you to monitor the Part 53 rulemaking docket ID. Again, it's NRC-2019-0062 on regulations.gov website for updates in important documents related to this rulemaking.

Finally, we are always looking for ways to improve our public meetings and your feedback is important to us. At the end of this meeting, please

go to the NRC public meeting website and click on the recently held meetings button and look for this meeting.

The meeting feedback form will be at the bottom of the meeting announcements. I'd like to thank everyone for participating in today's meeting and I hope everyone has a good evening and the meeting is now closed.

Thank you very much.

(Whereupon, the above-entitled matter went off the record at 4:55 p.m.)