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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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10 CFR PART 53

"LICENSING AND REGULATION OF ADVANCED

NUCLEAR REACTORS"

SUBPARTS C AND F PRELIMINARY PROPOSED RULE LANGUAGE

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THURSDAY

JANUARY 7, 2021

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The Category 3 public meeting was held by videoconference at 12:00 p.m., Robert Beall, Rulemaking Project Manager, presiding.

NRC STAFF PRESENT

ROBERT BEALL, Office of Nuclear Material Safety and Safeguards

BILL RECKLEY, Office of Nuclear Reactor Regulation

JOHN SEGALA, Office of Nuclear Reactor Regulation

NANETTE VALLIERE, Office of Nuclear Reactor Regulation

ALSO PRESENT

FRANK AKSTULEWICZ, Terrestrial Technology

TRAVIS CHAPMAN, X-Energy

CYRIL DRAFFIN, U.S. Nuclear Industry Council

DENNIS HENNEKE, GE-Hitachi

JEFF MERRIFIELD, U.S. Nuclear Industry Council

ROSS MOORE, Oklo

STEVE NESBIT, LMNT Consulting

MARC NICHOL, Nuclear Energy Institute

REBECCA NORRIS, NuScale

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

12:04 p.m.

MR. BEALL: All right. Good afternoon, everyone. I want to welcome everyone 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 insure that today's meeting is informative and productive.

This is a Category 3 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 public comment so there will be no formal response to any of today's discussions. For today's public meeting we are using Microsoft Teams to support the discussion of the Part 53 rulemaking instead of an operator-assisted bridge line that has been used in the past.

We hope that the use of Microsoft Teams

will allow stakeholders to participate more freely during the meeting but this will require all of us to continuously assure that our phones are muted when we are not speaking and to do our best not to speak over each other. To help facilitate the question and answer portions of the meeting, we request that you utilize the raised hand feature in Teams so we can identify who has a question or comment.

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 display area. You can also use the chat window to alert us that you have a question. Please do not use the chat window to ask or address any technical issues related to Part 53. The chat window is not part of the official meeting record and is reserved to identify when someone has a question or for handling any meeting logistic issues.

To minimize interruptions, the staff will call on participants who have used the raised hand feature or the chat window to identify when they have a question or comment. If you join the meeting using the Microsoft Teams bridge line, you will not have access to these features. If you joined using the bridge line and would like to ask a question or

comment, you need to press the star 6 button on your phone to unmute it. The staff will pause at the end of each topic to ensure that all participants have an opportunity to ask questions before moving onto the next topic.

After your comment has been discussed, your phone line will be muted again. If you want to ask questions on a future topic, you will have to press star 6 to unmute your phone once again. Slide 2, please.

The agenda for today includes NRC staff and stakeholder presentations on three topics related to the Part 53 rulemaking. Topic 1 will be discussion of preliminary proposed rule language for Part 53, Subpart C, Requirements for Design and Analysis. Topic 2 will be a discussion of the preliminary proposed rule language related to the facility safety program section of Subpart F, Requirements for Operation.

And the third topic will be a review of stakeholder comments on Subpart B to acknowledge the inclusive safety requirements submitted via regulations.gov and from the November 18th, 2020, public meeting. Questions from the public and further discussions will follow each topic presentations

today. We will also have one 15 minute break during today's meeting. Slide 3, please.

I would now like to introduce John Segala. John is the branch chief of the Advance Reactor Policy Branch in the Office of Nuclear Reactor Regulation. John will be giving the opening remarks for the days meeting. John?

MR. SEGALA: Thank you, Bob. Good afternoon. Consistent with the Nuclear Energy Innovation and Modernization Act we are developing a new alternative regulatory framework for advanced reactors that embraces risk-informed approaches and performance-based criteria that will be technology inclusive to a wide range of new technologies.

Key to the development of this rulemaking is the establishment of high level technology-inclusive performance criteria and leveraging recently developed staff guidance in Regulatory Guide 1.233 which endorses the Licensing Modernization Project, or LMP, methodology described in the NEI 18-04 document as one acceptable method to use for establishing key parts of the licensing basis and content of applications. LMP focuses on identifying the licensing basis events, classifying the structure systems and components and ensuring adequate defense and depth.

We also plan to leverage the Southern-led NEI coordinated and Department of Energy cost-shared Technology-Inclusive Content of Application Project, or TICAP, and the NRC led Advance Reactor Content of Application Project, or ARCAP, which will provide technology- inclusive risk-informed and performance-based application content guidance. We are targeting late February for our next public meeting on TICAP and ARCAP.

In order to meet the Commission's directed schedule to publish the final Part 53 rule by October of 2024, we are having extensive stakeholder engagement to solicit feedback to better inform the staff's proposals and to ensure a shared understanding of what will be included in the final rule. As Bob Beall mentioned, today's meeting is the second of many webinars the NRC will be having every four to six weeks over the next year to provide an opportunity for external stakeholders to provide feedback on the NRC's development of Part 53 preliminary proposed rule language for advanced reactors.

Today we will be seeking input on preliminary rule language for Subpart C Requirements for Design and Analysis and Subpart F, Requirements for Operations Regarding the Facility Safety Program.

We will also be discussing stakeholder comments on the preliminary rule language for Subpart B Technology-Inclusive Safety Requirements that was discussed during the November 18th, 2020, public meeting.

Some of the preliminary rule text being discussed today is new and quite different from the current regulations in 10CFR Parts 50 and 52. So I would encourage stakeholders to keep an open mind as you listen to the staff's rationale for suggesting innovative approaches. We're looking forward to having discussions today and hearing any feedback you all may have. That completes my opening remarks. Thanks, Bob.

MR. BEALL: Okay. Thank you, John. I would now like to introduce the NRC staff who will be making presentations during today's public meeting, myself as the rulemaking project manager and meeting facilitator, and then Nan Valliere and Bill Reckley from NRR. Bill and Nan are the Part 53 technical leads for this rulemaking. In addition, we have members of the public who have requested time to make presentations on one or more of the topics from the Nuclear Energy Institute, the U.S. Nuclear Industry Council, and Hybrid Power Technologies.

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 ML21006A as in alpha, 000. 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 public meetings that the NRC staff will be discussing the Part 53 preliminary proposed rule language. Today's meetings will focus on Subpart C and the Facility Safety Program section of Subpart F. This is a Category 3 public meeting which means that the public participation is actively sought as we discuss the regulatory issues.

Because of the number 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 had a chance to ask their question, we can circle back and allow people to ask additional questions if we have time. 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 public

meeting.

Today's meeting is being transcribed so in order to get a clean transcription and to minimize distractions during the meeting, we ask everyone to please mute their phones when they're not speaking. A summary of today's transcript of today's meeting will be publicly available on or before February 6, 2021. Finally, this meeting is not designed nor intend 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 back up slides that contain additional information about the Part 53 rulemaking. And with that, I'd like to turn the meeting over to Nan Valliere who will continue the discussions of the Part 53 rulemaking; Nan?

MS. VALLIERE: Thank you, Bob. Next slide, please? Good afternoon. As Bob mentioned, my name is Nan Valliere and I'm a senior project manager in the NRC's Advanced Reactor Policy Branch.

On Slide 5 we have a slide that we have used in most of our past public meetings on Part 53

and we'll continue to use. This slide lays out the plan to build an entire regulatory framework in Part 53 from design through construction and operation, and eventually to decommissioning. In November we discussed the highest level safety or risk metrics as described in the purple box. But as both John and Bob mentioned, today we will be discussing rule text in Subpart C on design and analysis and a portion of Subpart F on operations that would address requirements for a facility safety program. Next slide, please.

Slide 6 is a slide that the staff first presented in November and that we intend to use at each of our Part 53 public meetings. This slide is a graphical representation of how the staff plans to work through stakeholder interactions on each subpart of Part 53, support the submittal of the proposed rule package on the milestone schedule that the staff has provided to the Commission. As the note on this slide indicates, this is a living picture of where we are today and we have made some adjustments from the version presented in November to reflect our current thinking.

The note also highlights the fact that upcoming introductions of the concepts and discussions

of preliminary rule language will include a variety of topics that have historically involved specific technical and programmatic specialties. We wanted to encourage stakeholders to ensure that appropriate subject matter experts are involved in future discussions of rule language for these technical areas to improve our chances of having efficient and effective meetings.

An example of an area where such subject matter experts will be needed are concepts and discussion within Subpart F on operations that involves staffing levels and operator licensing. Those discussion will take place later this year. We will do our best to specify in future meeting notices which topics we intend to cover in any given meeting.

As we mentioned at the last meeting, the staff recognizes that there will be instances where developments in one subpart of the rule will have an impact on the subpart that was closed out earlier and where revisiting previously closed out subparts will be unavoidable. Nevertheless, the goal is to reach closure on each topic to the greatest extent possible on the timeline depicted in this matrix.

And now I'd like to pause here to ask if there are any comments or questions before we move on

to the discussion of Subpart C on design and analysis. All right, hearing none, I will turn the meeting over to Bill Reckley now. Next slide, please.

MR. RECKLEY: Okay, thank you, Nan. So as Nan said, we're going to talk first through Subpart C. We did publish and it's available on the public meeting notice, our discussion table where we tried to give some thoughts that we had as we developed this subpart as we had previously so hopefully people find that useful. If we go to the next slide, please, Slide 8.

This is the outline. I won't spend a lot of time going through this because we're going to talk about each of these sections as we go forward. It does lay out just as we go forward, the general structure if it helps as we have the discussion, that we have the safety criteria that we talked about in Subpart B at the last meeting, both the First and Second Tier safety criteria. And we have the safety functions that are needed in order to meet those safety criteria. In this section we then go down a level and talk about the design features that will be supporting those safety functions.

And then one level below that are the functional design criteria that would be established

for a particular design feature. So one might think of it in a general term that if the safety function is cooling, a designed feature might be a cooling loop and the functional design criteria would actually be like a heat removal rate. And so you can just go down levels of detail and that's the way this subpart is laid out, starting from the higher safety functions down to specific functional design criteria for specific design features.

So if we go on then to, this is just a continuation of the logic or the layout of this subpart. I'll touch on this just so people have time to think about it if you haven't looked through the material in detail. One feature or provision that's been put into this subpart is the 53.470 at the top of this page which is Application of Analytical Safety Margins to Operations Flexibilities.

This is the notion of trying to actually get the benefit of the attributes of advance reactors as they were laid out in the Advance Reactor Policy Statement. And the Commission's direction in subsequent guidance which I, personal opinion think is one of the most important ones, is the Commission direction and the staff requirements memorandum for SECY 10-121 where the staff was trying to establish

what the risk metrics for advance reactors should be and that SRM is where the Commission basically specified and clarified what had been ongoing discussions on the meaning of the advanced reactor policy statement for decades and clarified that the safety goals and general performance measures established for the existing reactors at that time were also good enough for advance reactors.

And that the attributes of advance reactors were however expected to provide safety margins in comparison to the older generations. But that safety margin was then expected to be applied to provide operational flexibilities. And so with that kind of a bit of a history you can see I think why we added this into this subpart. Then we'll talk about quality assurance and design interfaces. So with that if we can go to Slide 10.

The first higher level section within this subpart is just the design objectives and this is intended to be consistent with the objectives laid out in Subpart B, meeting the overall safety criteria and as we proposed in Subpart B, the two tier structure. Again, as Nan said, we know all of this is still being discussed and I have faith that as we go forward we can kind of manage to have discussions. But as Nan

said, we're going to have to sometimes be looking forward while also looking in the rearview mirror and making adjustments to what we've already talked about. But again, 400 is just a, the objectives for the subpart.

One just note, the second bullet here. And you see this phrase repeated a lot and it just reflects the integrated nature that we're trying to build into Part 53, which is you achieve the safety goals, the safety criteria through a combination of design features, hardware, people, and programs. And so those three things keep coming up, that's because we're trying to look at it as an integrated package and there will be the ability to address in choices the designers can make to address particular safety functions using combinations of hardware, people, and programs.

That gives a great deal of flexibility. It also makes kind of the development of this rule a little more complicated because all of the parts interface and interplay with each other.

So if we go onto Slide 11, this talks about the two sections, 410 and 420 which are laying out the functional design criteria related to both the first and second tier safety criteria from Subpart B.

I know it's a matter of ongoing discussion about how normal operations are included in these discussions. This subpart again was developed based on Subpart B as we talked about it in December. I think some of the issues with normal operations, both the first bullet under the first tier meeting the 100 millirem, that's usually not been too controversial.

The normal operations under the second tier and referring to the as low as reasonably achievable, of course we know that's a matter of discussion and we'll discuss that later in the day when we go back to revisit Subpart B. Both of those bullets under normal operations are also under discussion in terms of the content of applications through the TICAP and ARCAP programs projects that John Segala mentioned.

And so again, there's a lot of balls in the air as we're doing Part 53. If you visit the advanced reactor website at the NRC's website, there's basically an integrated schedule that tries to show all of the things that are going on or at least many of the things that are going on in regards to preparing guidance and other activities to support advance reactors. Many of those come back and play into the development of Part 53, either in the

specific proposals or in what we're looking ahead might be guidance.

And so when we look at the content to applications related to normal operations and the ALARA's reasonably achievable goal, we would be looking over also at ARCAP as supporting that activity. I bring this up because we all need to look at this broader, broader landscape. And if, if part of the concern in addressing ALARA within Part 53 has been traditional issues we've had in that area during licensing reviews associated with Generation III and Generation III plus reactor designs, one of the ways we were trying to address that was through the ARCAP.

So you do have a problem being recognized and trying to be resolved through a couple different ways. So again, I only mention that to say there's many balls in the air and you have to kind of pick the ones out that are related to a particular problem and not necessarily think that Part 53 is the only avenue to address some concern. Then so that addresses the normal operations in terms of the functional design criteria.

In terms of the unplanned events, those are of course the events that are not, we're not able to address exactly through the performance-based

programs as you're able to do normal operations. But there is a performance-based element but because the unplanned events are being accessed through analysis versus actual monitoring of releases, for example, the performance-based elements will be, will come under things like the reliability assurance configuration control and some other things that will likely be in Subpart F under related to operations.

So if that's 410 and 420, if we can go to Slide 12. I'll just reiterate, we developed this subpart based on our existing structure, Subpart B. We know that there are some comments on the inclusion of protection of plant workers within Part 53. But this part was constructed on the premise that there is a criterion under the safety criteria for workers. It still, even in this context, largely refers to Part 20 in terms of both the 100 millirem type number and, I'm sorry, for the occupational dose would be like the five rem number to plant workers and then the low as reasonably achievable for our performance goal.

So if we go on to Slide 13, we put in a 440 which goes to the actual, or some actual design requirements and in particular the NRC goal, the U.S. Government goal overall to maximize the use of consensus codes and standards. And so one paragraph

of 440 points out that to the degree possible, the design process and design features should be done in accordance with generally accepted consensus codes and standards.

And then as the note points out, this leaves some latitude when we say generally accepted and it also goes to the second bullet on materials being qualified, that there will likely need to be a discussion on that terminology whether those kind of broad terms could be put into the rule and then guidance could be developed to actually support the use of specific consensus codes and standards is kind of what we were hoping and how we would word this, as opposed to pointing out specific codes and standards as is done to some limited degree in Part 50 now, in particular in regards to ASME and IEEE and maybe even a couple ANS, American Nuclear Society Standards.

So I know there's some feedback that we already expect to get on this so I'll just, I'll wait for that discussion after I run through this. The last bullet, safety and security considered together is coming out of the Advance Reactor Policy Statement and just the general goal that security be looked at as the rest of the plant is being designed, as opposed to designing the plant for traditional safety

functions and then doing security as an overlay.

If that were to be done you miss opportunities to actually meet the goals and security in terms of also reducing the need to address that particular area primarily through armed personnel, for example. And then the last bullet is largely our capturing of the idea in 10 CFR currently in 10 CFR 50.43(e) which was put in to address advance reactors and novel design features and basically just reinforcing that as you introduce things that may not have a lot of operating experience to support, that those features would have to be demonstrated through some combination of analysis test programs and the possible use of prototype testing.

And that just is kind of supportive of the general notion that, and we use the language in subsequent sections, that there has to be things done in those spaces, analysis testing and operational experience, to provide the needed assurance that design features are going to perform. So if we go to Slide 14.

This moves us then from the design area, or traditional design area over to the analysis portions. And the first thing and we expect to have some discussion about it, is that we start off with a

requirement to have probabilistic risk assessment prepared to support either the certification or issuance of an operating license for a facility.

We've had some discussions internally and do see this as a logical extension or evolution of the NRC's risk-informed activities over a fairly long period of time, going back to the reactor safety study, then the PRA policy statement, the risk-informed initiatives since that time, the inclusion of a requirement within Part 52, to have a PRA prepared.

This analytical requirement under 53.450, the preliminary language, is to take it the next step and say not only do you do the PRA and gain insights from it, but it becomes an important element of the analysis, the design, and the licensing of a plant.

What we'll acknowledge, there are other assessment tools and other industries might use process hazards analysis or even nuclear plants traditionally using failure modes and effects analysis and combinations of these tools, we picked PRA and actually said we would require it, largely because as I mentioned, we have a history of developing that.

We also have the infrastructure in terms of the safety goals and other things that we can build off of this requirement. So that's why we chose in

the preliminary language to include the requirement for a PRA. And then as I mentioned, the sub bullets under that are not only do you need to do it but you need to use it and it will become a basis for things like identifying licensing basis events, classifying equipment, and assessing defense-in-depth, all of those elements being carried forward from Subpart B.

Also conforming to generally accepted codes and standards. You know, we have PRA standards available for light-water reactors and endorsement through Regulatory Guide 1.200.

And we have a current activity underway looking at the PRA standard for non-light water reactors that is expected to go through the standards process and be issued in the relatively near future.

We also have a requirement not only to perform it, but similar to Part 52, a requirement to maintain and upgrade it every two years.

As I mentioned, sort of like in the design process, the analytical codes would be expected to be qualified for the range that they are using.

We include a provision to address some specific analyses that have been incorporated into the existing regulations, fire protection, aircraft impact under 51.50 and mitigating strategies under 51.55.

And then the last bullet is the requirement to have at least one set of your licensing basis events, one element of the licensing basis events, to include a fairly traditional category design basis accidents that would rely only on safety related equipment, have perhaps some other conservatism as opposed to the best estimate analysis approaches that are usually associated with the PRA.

So we want to go to Slide 15. Out of the PRA, and to some degree out of the assessment of the design basis accidents, we have the safety categorization and identification of needs to have special treatment for equipment or personnel actions. We've used somewhat the existing terminology as it's been developed in for the operating fleet, the traditional safety related terminology somewhat looking at 10 CFR 50.69, the risk-informed categorization of equipment.

And then also more recently, the licensing modernization project that John Segala mentioned. The second category is the non-safety related but safety significant. Under the licensing modernization it's referred to as non-safety related with special treatment and has some criteria proposed for that category, and then non-safety significant, which would

be that equipment not warranting additional special treatment beyond commercial grade equipment.

So again, this is, we look at this along with the other analytical requirements under 450 I just mentioned and believe that one way to meet these requirements would be through NEI 18-04 for the licensing modernization project and its associated endorsement through Regulatory Guide 1.233.

So I think we can move on to Slide 16. Just a kind of continuation of that discussion, in particular what do we mean by special treatment. And just to, largely special treatment is those things that would need to be done, again, beyond just procuring this commercial grade equipment, to ensure that the equipment is able to perform under its service condition.

So this could be things like the radiation environments, the temperature, humidity conditions that might be associated with a particular event and so forth, and with the reliability that's assumed in terms of the probabilistic risk assessment. And so that might result for example in its inclusion in a reliability assurance program that would likely get captured under Subpart F in operations.

We expect to have, for example, in terms

of configuration and reliability controls, tech specs to address at least the safety-related equipment and reliability assurance programs that would pick up the special treatment requirements for those, that equipment that's designated as non-safety related but safety significant.

We also include discussions of human actions and kind of looking at them in a way that is similar to equipment in terms of if human actions are needed to perform an operation, a change in state of a valve, or whatever, then the assessment would have to look at the ability of the people to perform that function.

So with that I think we can go onto Slide 17. So this is the provision 53.470 that I previously mentioned, and this is the application of the analytical safety margins to operational flexibilities. And the analytical safety margins can support other things. They should hopefully support the ability to put together a simpler analysis or a simpler licensing application if the analytical margins want to be applied for that purpose.

In addition to that, and we've used this so-called bow tie figure in a number of previous discussions. In the far, and I didn't want to focus

on the figure, but just for those who have, are not familiar, on the left side of the figure it has threats or events, internal, external, or malicious. You have a series of barriers which can be equipment programs, operator actions that are meant to prevent a plant damage state. And that's usually, for large light water reactors, the plant damage state that's normally used is core damage. We can use either core damage or fission product migration, whatever the term you want to use, but that's the traditional case where you're losing control of the hazard and in our case the hazard is the radiological materials.

And in the case you lose control of the hazard, on the right side or the mitigating measures that you put in place. And so those include for newer designs, severe accident design features that have been put in for the Gen III+ plants. Another barrier is the, or provision in the mitigation area could be the siting away from population centers. Certainly, emergency planning is usually considered to be a mitigation measure to be applied as necessary.

Then under societal benefits you have mitigation measures with the last one usually considered to be something like Price-Anderson to address the potential societal or economical impacts

from the plant damage state.

So all of that talked about, what we're trying to set up under 53.470 is what we've seen as the most likely applications of safety margins to operational flexibilities.

And we have two that we're currently working on, and more that we're beginning to work on in areas such as staffing that might also be a case where we would apply safety margins to gain flexibilities. And we'll talk about that in future meetings. But let's pick one that we, or two, one or two that we've already have underway and we've previously discussed in various forums.

One major one is in the area of emergency planning. So we have a proposed rule out that basically lays out that if one can demonstrate through the analysis portions we previously discussed that the offsite consequence is less than a certain threshold with the current proposal being one rem over 96 hours, then you can take that into consideration in defining the emergency planning zone, in theory taking the emergency planning zone all the way to the site boundary, if you can show you meet that threshold at the boundary.

So how does one achieve that? One

achieves that by having attributes that either prevent the core damage state or at least prevent the release through another barrier like a structure. And so this provision is simply laying out in the analysis space the provisions for how that could be applied to other areas.

For example, emergency planning will likely be in Subpart F for operations and if you're going to demonstrate that the offsite consequences are below a certain threshold in order to gain flexibility in emergency planning, that has to be incorporated into both plant design and the analysis and then maintained over the life of the facility to make sure that you're always meeting those thresholds that were used to justify something like a reduced emergency planning zone or an alternate approach to population density in the siting arena.

So this is the way we're proposing to lay this out. I, you know, there have been some comments. And one we'll talk about today from some stakeholders would probably negate the need for this, if for example you simply said all advance reactors have to have margins, and then we will use the margins that are required to kind of generically say, now we can justify alternatives to areas like emergency planning,

siting, staffing, et cetera, because by definition all plants meet this requirement by having the appropriate analytical margins. That's a possible approach. You know, that was talked about in previous discussions and our thought was, the agreement was, to keep it broad and to allow the trading of safety margins for flexibilities but not to require the safety margins. And so that's a point of discussion, and we'll have it, I know, through at least one of the comments we're going to get later in the day.

So I think we can go to Slide 18. The design control quality assurance requirements, this should look familiar to most. It's largely derived from Criterion III in the existing Appendix B to Part 50. It has the same note in terms of the QA referring to generally accepted consensus codes and standards with the thought that if possible and if pursued, if there were other codes and standards, for example, other than ASME and QA 1 that could be proposed, then this language would allow that to be. For example, if someone wanted to say that ISO standards related to design control provided an acceptable level of quality assurance.

So going on to Slide 19; this is the last section within 53.490 within Subpart C, and it talks

about the need to have design and analysis interfaces with other areas.

One example is given, is the configuration controls in Subpart F, and this has traditionally been the case that design activities lay out particular systems and trains. And then within configuration control like tech specs or technical requirements manual, you might get more specificity in terms of configuration control, allowed outage times, and so forth.

So it's really the same concept here. You're expected to get the design out of this subpart. The analysis performed here would then also support the establishment of configuration control, be it tech specs, reliability assurance programs, or some other measures, to maintain that during operations over the life of the facility.

So I think we can go on then to 20, which was just one last area. We didn't specifically address this within the discussions, but I lay it out as an area for us to possibly talk about and try to elaborate if there is a distinction between an inherent design feature and our kind of historical approaches to both active and passive safety features.

Inherent is usually looked at, well, it's

sometimes looked at as a variation of passive and sometimes it's looked at as going beyond passive and being even superior to a passive system, in that it's simply relying on a natural process.

So a passive system may use something like the convection of air to provide cooling to reactor vessel or to a reactor cavity and that could be a passive in that it doesn't need electrical power, doesn't necessarily even need for a component such as a valve to change position. Whereas inherent would be something built in and you wouldn't even need to ensure that you could develop something like a pathway for convection to be established. So it might be a material property, a reactivity feedback coefficient or something that is even, you have a higher level of confidence in its performance even above a passive system.

And so the thought was, should we develop some guidance for further discussion on how inherent design features are possibly credited within the analysis and within the design? It's kind of an open question. I'll just leave it as a topic for discussion.

So I think that was my last slide. We, Bob, I'll turn it back to you. Did we want to just go

into the presentations and then open it up to general discussion?

MR. BEALL: Well, we have three raised hands, so let's go out and address those, okay? Is that okay with you?

MR. RECKLEY: Okay. That's fine.

MR. BEALL: Okay. I think the first one, Dennis from GE Power, you can unmute and ask your question or comment, please?

MR. HENNEKE: That's fine. Thanks, yeah, Dennis Henneke with GE-Hitachi; I am the vice chair for the JCNRM [Joint Committee on Nuclear Risk Management], which develops and maintains PRA standards for light water and non-light water reactors.

On Slide 14 you mention when we start to use the PRA, a number of things to unpack here. Let's talk about the fourth bullet under the first bullet, maintained and upgraded every two years.

So a PRA is developed per the standard and maintained per the standard and then the standard is endorsed by NRC and right now it's right down around 1.200 and for a non-LWR to be through a different document.

First, the word upgrade has a particular

meaning in the standard language and should not be used. It's updated. Upgrade means it requires a peer review to be redone in standard language, and so they can't force somebody to upgrade something every two years. An upgrade is a specific change that is a novel change that requires new peer review, so it's updated.

Second, the cycle of updates is determined by the change. So the standard has a change process and if a plant finds that there is significant change in insights, they may have to perform an immediate update, whereas otherwise they set up a cycle within their process, which is typically every two cycles, but every utility in existing has their own process, and then they update the PRA and the associated analysis on a regular basis. So I would not regulate the cycle. I would let the standard let you do that and just to say it's maintained and updated per the standard requirements.

On the second to the last bullet, PRAs, firstly PRAs do not assess fire protection, they assess fire hazards. Fire protection is a part of the fire hazard analysis and the PRA can do fire, no, fire PRA can be performed. We don't assess fire protection.

We also do not assess aircraft impacts. PRAs can be used to inform the aircraft and impact analysis or you can do it deterministically. There's no requirement to conflate to do any aircraft impact using PRA.

Some folks find it advantageous to do so and the methodology of it is there to do it but we would not assess, in the PRA, aircraft impacts. So there's a lot to be corrected on this.

As far as use of PRA for some of the following slides, for safety classification and so on, it seems to me that what you're, you're requiring an LMP type evaluation under Part 53 and it doesn't, if you're requiring PRA to be used for safety classification, I see no other way than LMP to do that.

You know, now the plants have been, some plants are going in the LMP type evaluation, but others have preferred not to and to go in with a more deterministic approach, with a PRA supporting it, but with a deterministic basis for safety classification and license-based events and so on.

So the requirement to use the PRA to do a safety classification is really a back door way to require LMP, and I think you should rethink what

you're trying to do there with regard to safety classification and the requirement to use PRA to do so. Thanks.

MR. BEALL: All right, thank you, Dennis. Do you have anything to add, Bill?

MR. RECKLEY: No, great comments. We'll look at those. Under the, for example under aircraft impact, that does show up under the provisions. It says, if not addressed by the PRA, you have to do it. Otherwise, and you know, we have to keep in mind that this rule is going be in place for a long time. And so, who knows 20 years from now what the PR -- what would be within the scope of a PRA? But, we'll, yeah, great comments. We'll look at the language and think about what you said.

MR. BEALL: Okay, Ed Lyman, Union of Concerned Scientists, you have your hands up. You'll have to please unmute your mic, and please ask your question.

MR. LYMAN: Hi, can you hear me?

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

MR. LYMAN: Great, sorry. Yeah, so a few comments or questions. So, on the safety, security interface section that Bill flagged, which I think is important, but I think it raises questions about how

you would actually implement the security aspects. So, I see that the language says something about resolving security issues, which is pretty vague. But my question is, do you think you would need to actually reference or incorporate the design basis threat into this world to ensure that security issues, quote, unquote, are being identified and addressed through the design and mapped? So it raises the question of, as you say, that PRA potentially evolving over decades.

Certainly the design basis threat and the adversary characteristics will. And that could render a judgment that you make at the design approval phase incorrect later on, which you would have to address through compensatory measures.

So, have you thought through all the complexities of what I'm asking, is my first question?

MR. RECKLEY: Probably not. But you have to look at Part 53 in how it would work with Part 73. At this point, our initial thought was not to roll security altogether into Part 53.

But, so this would only be part of the picture. There may be changes to security either coming out of this, or coming out of related efforts, or future efforts. And they would probably go to more

your specific questions as it relates to security. For example, we would not undertake, under this assessment, to redefine the design basis threat. That will continue to be a security aspect that's done in that realm.

MR. LYMAN: Right, but I'm just saying there may be, you know, there are design aspects that may, the DBT and the adversary characteristics would have a bearing on whether it's a security issue or not.

MR. RECKLEY: Right.

MR. LYMAN: For instance, there's just the thickness and reinforcement of the structural walls, so.

MR. RECKLEY: Right, and that's what we're, that's what we traditionally try to encourage people to look at, as you're doing the design for the safety aspects, to also consider how it might help or introduce a weakness in security, so, right.

MR. LYMAN: Okay, my second comment is, I haven't been following these discussions as closely maybe as I should. So I was pretty shocked when I heard Courtney say in December, before the other NAS committee that's looking at advanced reactors, that some stakeholders are questioning the role of PRA, or

the nature of PRA as part of this rule.

And that seems, you know, absurd to me given all the emphasis that's been put in on risk controlling it. But I guess I'd like to point out that NEIMA doesn't require you to have a risk-informed rule. They just thought that it should be technology inclusive. The language is, doesn't say risk-informed.

So, you're free not to make this deterministic rule where it's to allow, you know, applicant to continue with Part 50 if they choose with exemptions, in its deterministic analysis. But to question the need for a high quality and accurate, as accurate as possible, stated in the PRA as part of this is ridiculous from looking at the history.

My last point on the operational flexibilities issues, which I have issues with, but I think that what you're talking about does violate the intent of NEIMA, that reactors that qualify for use of this rule would have substantial improvements compared to the current generation of reactors. And this, incorporating this operational flexibility option, would seem to undercut that.

And but, I'm also wondering hypothetically if the Commission were to modify its Advanced Reactor

Policy Statement to now require the reactors, let's say that qualify under this rule, to have clear and consistent increased safety margin for the public. And that has to be maintained.

And we just caution you that maybe, you know, anything is possible and that may be something you're looking at for the future, because that makes a whole lot more sense than the framework that you have now, and would be consistent with the intent of NEIMA. Thanks.

MR. RECKLEY: Okay, thank you, Ed.

MR. SEGALA: Hey Bill, this is John Segala. I just wanted to add, in NEIMA when it defined -- it has a definition section. And when it defines what technology inclusive regulatory framework is, it says it, means a regulatory framework developed using methods of evaluation that are flexible and practical for application to a variety of reactor technologies, including, where appropriate, the use of risk-informed and performance-based techniques or other tools and methods.

MR. LYMAN: Right, and where appropriate it the key language there.

MR. SEGALA: Yes.

MR. LYMAN: Because it is with total

discretion.

MR. RECKLEY: I think we would agree with you, Ed. I think this is a conscious choice on our part that, as I mentioned earlier, it's an evolution of the use of probabilistic risk assessment. And if you look back over the decades, we just think this is the next step on its application.

But I'd agree with you that it would be over reading NEIMA to say we needed to do this.

MR. LYMAN: Risk-informed without a PRA is meaningless, that's my --

MR. RECKLEY: Okay, additional hands?

MR. BEALL: Yes, we have one, Mr. Kee, Ernest Kee.

DR. KEE: Hi, thank you, Bill. It's a very informative presentation. I have a very, I made this comment on the federal rulemaking website, but you know, NEIMA says innovation. And what I'm afraid of, and from what I'm hearing, in the last, this one and the previous public meeting, is the innovation part might not be emphasized, in my view, enough.

I feel like we're going down the same path that we followed in 50, in Part 50. And I would like just for people to think about this as a possibility to allow actual commercial operation of these advanced

reactors.

And that's this, if focused on containment, that's risk-informed. So, there's been a lot of work in containment analysis for various kinds of accidents. And I think, my thinking is containments can be designed to accept a full on core damage event, what we used to call 'core-on-the-floor' event.

And they can be designed with high probability of success against release. And the reason I'm going here is because I feel like the Commission -- well, risk-informed, so risk-informed. Where's the risk, from the Commission's point of view, is exposure to the public, right. And so, you'd have to contain an event.

And what I've seen, even in the Gen II and reactor experience now, is every one of them has resulted in some level of radioactive release, above what you have pointed out as being a normal release level. So, in order for every reactor, for all the different designs to be able to be licensed under this new regulatory framework, I feel like it would be proper to focus on containment.

And allow -- so we'd have two levels. Containment would be under regulation and would follow

basically the same kind of requirements that we have now, like in Appendix A. But the rest of the process part, these vendors are doing a lot of work in analysis to ensure these things don't break down, don't have a core damage event.

And I think those should be relegated, all that process internal, what you call internal hazards. The core damage events should be relegated to commercial standards. And so there would be two levels. And containment would be the focus of the NRC.

This would allow different technologies to be built under the same kind of a standard without having to focus on their various different, you know, types of technology they employ. And the performance part, performance based part I think could be -- this is my opinion -- could be the NRC's oversight and enforcement that the commercial standards committed to would be properly maintained.

So, that's my comment. Thank you for the presentation and listening.

MR. RECKLEY: Just a quick question back to you, Dr. Kee. What I have for you is, would that apply -- in the advanced reactor realm we've shifted over to some degree to talk about functional

containment, because that function may not be served by a traditional structure.

Would your argument equally apply to a functional containment where that attenuation or preventing the release is served by something other than a structure?

DR. KEE: Yes, but I think the key -- there's other things too, I point out in my comment that need to be looked at. But the point I'm trying to -- I think the inherent design feature that you all have pointed out is probably operative here. And I think that's what you're hinting at.

That generally, the expectation would be, you could walk away from this. This is very similar to something I got involved in before. You know, we talk about 96 hours in one rem. I don't think that's the right attitude.

The right attitude is the containment following an accident has to be there in place. How long has it been since Fukushima, I mean it's years, right? So this thing has to be very well built, but by focusing on the containment end. And it has to have defense-in-depth, it has to have safety more. I think it has to be safe for the public to have confidence in this kind of new technology. We have to

be safe, but I think we can do that.

And I think the best way to think of outages is what you said, is these inherent safe design features are, I'm sorry, yeah, inherent design features as you refer to them. Yeah, I think that's what I have in mind.

MR. RECKLEY: Okay, thanks. Bob, or maybe we can go over to Cyril's presentation.

MR. BEALL: Yes, we can move on now. That was the last hand.

MR. DRAFFIN: Okay, thank you. This is Cyril Draffin with the U.S. Nuclear Industry Council. We'd like to start with some opening comments from Jeff Merrifield.

MR. MERRIFIELD: Thank you very much, Cyril. I'd like to thank NRC staff for providing an opportunity for us to give our comments on parts C and F. Can I go to the next slide, please?

One of the things I just wanted to say up front, given the timing of when these materials were made available. And I think that was around, oh, I'd say December 18th, we have been limited in our ability to take a detailed look at this, more as a function of the holidays. And now we still got, we did get together on a variety of occasions and have worked to

provide some comments.

We have detailed comments on our feed. We'll be providing those later in the meeting. But we feel it's going to take us a little bit more time, particularly having had an opportunity to hear the presentation this afternoon, to give you a more detailed assessment.

One of the elements I think is important in that analysis is really going to the Bullet Number 4 is in order to understand how this all works together, we're really going to need to get a better understanding of other elements that are being prepared by the NRC and its contractors. Some of which you've telegraphed your intentions, others of which I think it will be necessary to take a look at it in more detail to see how all of thing hangs together.

Really there's the sense of understanding the totality of what you're trying to do. And obviously that will help put the subparts in context and be able to make a more detailed response.

Next slide, please. I think, you know, we certainly appreciate the extraordinary work that the staff has put into these efforts. I think the explanation that Bill provided, provides some

additional insights into the direction you all are going. I think we would certainly like to have opportunities to engage today and elsewhere to get a better sense of that.

One example that I think is the issue of Subpart F. We're attempting to create a Facility Safety Program. In our initial review, it was unclear to us what you were intending to address by this and what would be included. And I think having a dialogue today to understand that is going to be helpful.

I will admit up front, I think based on our initial review, there was significant doubts on the part of the advanced reactor community as to the utility of Subpart F.

Now, this may be of greater interest, given its operational nature, to future users. But I think in order for us to provide a more detailed understanding, we're going to have to certainly get into that in greater depth.

There have been some comments previously relative to Subpart C and the elements that were included on Page 14. I think we've got some members of our group that believe if you have a very small reactor, a microreactor, and perhaps others, having a full blown, full scope PRA doesn't make a whole lot of

sense. There may be some more deterministic ways of meeting adequate protection. And as is pointed out, NEIMA does not require a PRA. And so for that reason, we've got some questions on that issue. And certainly we'll raise that more.

We do want to be constructive today, and so part of our testimony -- and we've got a variety of people who will be talking today -- part of it will be to raise what we think are some questions regarding how you all want to implement the draft rule. Getting a better understanding of that intention will certainly put us in a position to provide more detailed comments in the upcoming weeks.

Next slide: one of the things we would like to suggest, there's a format that we have gotten ourselves into where the staff prepares certain elements of what you want to have in the rule. And then you send that our direction, and we prepare comments, we send that back.

And we think that there is a utility in trying to create more of a workshop format, where we could have a discussion and really try to garner the total picture of what the proposed rule is intending to do. And really go beyond commenting just on the individual subparts.

We would certainly suggest after we've had an opportunity to give additional comments on Subparts C and F, perhaps reconvening at some point within the next three to four weeks and have a more open-ended dialogue about the expectations for Part 53, and how things should be going forward.

It would also as part of that, be helpful for us to understand, you know, what part or parts of 10 CFR that the staff intends to incorporate by reference or otherwise in Part 53, because that obviously plays into the total picture.

A couple of things I want to mention that were raised in the meeting earlier. There was references to Slide 6. One of the elements, that is a chart that I understand where it comes from. The Agency is trying to work through, or the staff is trying to work through these various elements on an aggressive agenda in order to meet the focus of the Commission.

A couple of things I'd say in that regard. Number 1, at the end of the day, I think we all need to be mindful that we need to get this right and we need to put the time into it that's needed to get a rule that's going to be used and useful. While certainly meeting the Commission deadline is

important, I think we need to make sure we use sufficient time to make sure that we can understand what is being intended, and get it in a function that people will be able to use.

As it relates to the individual elements of that chart, on Slide 6, for example it notes that the safety criteria will be closed on February 21st. Now, as was noted by Nanette and by Bill, there is an opportunity for some look-back, but I think there's an effort to sort of drive this toward a date in the future, 2024.

From my personal standpoint, I don't think this is a discussion about trees. This is a discussion about the forest. And so, you know, my view and I think it would reflect many of our members, any of those issues remain open until the totality of the package is complete.

Because this is a, it is a living document, it is a living rule. And until we get a complete picture of what it's going look like, I don't think you can really effectively say that anything is fully closed out.

In terms of staffing and timing, I do want to make a note. You know, in earlier days and I'm going back to a decade or more ago when we were doing,

preparing rules like this. And we had large integrated companies that design these reactors, I mean there would be leagues of experts that would be brought into, in various elements of these rules.

With the advanced reactor community, these staffs are a lot smaller. And so, I think we do need to be mindful in how we approach all this. There are stresses in terms of staffing. Again, we want to make sure we get it right.

The final bullet I have here really goes to the notion of a phased licensing approach. This is one that we've talked about in the past. It is one that is reflected in NEIMA. We certainly would like to understand as it relates to the staff's plans relative to Part 53, how that would come about, and how that would be incorporated in the rule?

The final notion, there were some comments made earlier regarding what was intended within NEIMA relative to advanced reactors, in the definition of what is meant by significant improvements compared to commercial nuclear reactors.

And I want to clarify for the record, there were a series of criteria lettered A through H, additional inherent safety features, significantly lower levelized cost of electricity, lower waste

yields, greater fuel utilization, (E) enhanced reliability, (F) increased proliferation resistance (G) increased thermal efficiency; or, and I underline the word or, which from a legal standpoint is quite noticeable, (H) the ability to integrate into electric and nonelectric applications.

So, as you read that definition in its totality, there is no driver toward requiring enhanced safety features. As long as the designs that you are to review meet the adequate protection standards, that is perfectly fine.

If there is a reactor design that comes in front of you, and has an enhanced ability to integrate into electric and nonelectric applications as indicated in H, that would be perfectly consistent with NEIMA. So, just wanted to clarify for that record, that for the record, because there was an inaccurate representation of that. Thank you very much. Cyril.

MR. DRAFFIN: Thanks. On the next slide our goal for today is, the NRC and the industries, is to both have a better understanding of Part 53 by the end of this meeting. We're providing a response to the topics NRC raised. And we are also going to provide additional comments.

So we'll start on design analysis for the topics that the NRC raised in their materials that they provided in December.

For Part 53.420, and these are preliminary responses as Jeff indicated, they're talking about the approach for specific event categories. And we think this is useful. It's an accepted structure provided that there's a use for those specific categories in the rule structure. And those would be beneficial to put in.

Regarding 53.430 which deals with occupational dose, we recommend that occupational safety not be included in Part 53. That was one of the questions that you'd raised. We don't think it's appropriate to regulate occupational dose one way for advanced reactors and another way for the current fleet. And just rely upon Part 20, which already exists.

As far as 440, you raised the question of generally accepted. Now, generally accepted is currently used in Part 50 and 52. But it's an uncertain phrase and, you know, it provides latitude. But as, we think this might be addressed in review guidance and Bill alluded to that in terms of the use of consensus standards and codes, and how that would

be done. But not as a requirement, as a license requirement to -- so we think it follows a little bit of thinking it through in terms of how this would actually be done.

On the next slide, to continue with comments that the NRC had raised, they asked whether qualified was okay. We think it is. In talking about the identification and treatment of human actions, we're not quite sure what information the NRC needs, and so clarification would be helpful.

And the topic that Bill raised at the end regarding inherent design features, we do think that advanced reactors offer that as a capability. But it's vitally important to understand how these inherent features would be credited within the context of satisfying the proposed regulation.

In other words, it's not just thinking through how, what the inherent features are in the advanced reactors, and then make sure they come out reliable. But how is it going to be used? How would it be credited? And whether that's really a question for regulation or something could be used in terms of supporting the analysis.

So those are some initial reactions to the questions the NRC had raised. But we wanted to go on

and provide some additional detail. So on the next slide, on discussion of safety and security, Steve Nesbit, could you provide a little background on this one?

MR. NESBIT: Sure, thanks, Cyril.

We, first of all, we just wanted to point out that, you know, we don't think that we're ultimately going to need to address security in the safety analysis report. That it's better to deal with it the way that it is currently being dealt with in light-water reactor space, which is to put that safeguards type information in the security plan.

Getting to the proposed requirement, the Part 53 requirement, which I'm repeating here, safety and security must be considered together in the design process such that, where possible, security issues are effectively resolved through design and engineered security features. I think we agree that that's the right way to, or the optimal way to address security in your design, but we don't agree with the statement as a regulatory requirement. And the reason is that it addresses the design process, not the resulting facility.

Like I said, we agree with the sentiment. In fact I went back to the NRC Policy Statement and,

you know, the Policy Statement notes that the NRC believes it's in the interest of the public, vendors and license applicants to address security issues early in the design stage to achieve more robust and effective security posture for future nuclear power reactors.

So that is what the Commission had to say, but translating that into a security requirement in Part 53 is potentially problematical. We think that you need to assess the adequacy of security against performance requirements.

Now, we'd like to see the current requirement structure for security maybe addressed a little bit, so that it's more performance based. It's rather prescriptive right now. At any rate, you need to make that assessment against what the requirements are, not how you got to your ultimate security design.

So that kind of leads to a question, and the question is, suppose you've got an advanced reactor applicant and the facility meets all the safety and security requirements. However, when you delve into it, you determine that safety and security weren't actually considered together in the design process, which is the requirement.

Would you refuse to grant a license at

that point, even though the facility has been safe and secure? Would you require a licensee to get an exemption because they didn't do it exactly the way you wanted them to? So, that's the perspective we're coming from. And we think that that requirement might be problematical for that reason; back to you, Cyril.

MR. DRAFFIN: Thanks.

On the next slide, we have some additional comments regarding design analysis in 450. There's a term of contributing factors to unplanned events. It's unclear, so perhaps you could clarify, contributing to what, the probability, the consequences? And indicate whether that's referring to prevention, or mitigation, or both, so just a clarification would be helpful.

And then on 450(b)(5) there's a discussion of plant control. And it would be helpful if NRC could clarify what is meant by plant control. And what was the goal of that section?

On the following page, still staying with the 450, there was discussion earlier today regarding the PRA. And we certainly see the benefits, industry sees the benefits of doing a PRA, but and while it is consistent with the LMP, the PRA insights should complement and inform the safety review, but the

submittal of a complete PRA should not be required. In other words, doing one would be beneficial, where you could pull out the insights, the analysis. It helps you in your design, but putting in the whole PRA should be a choice and not a requirement.

And we also raised a couple specific questions such as, how does the Agency intend to address microreactors and other designs that want to pursue a deterministic approach for selected portions of its application, such as seismic events? And, you know, just explicitly, is a PRA needed for microreactors? So it's, we've had some of that discussion today, but I think we need, you know, probably more robust discussion of how we would actually, the actual language that would be used and the intent and the flexibility that would be allowed.

Under 53.490, there is a discussion of control of interfaces, but it may be referring to change management or configuration management. And we've included the last sentence there, but it's not clear what the intent of that requirement is.

And then even more specifically, there is discussions of what's the state of technology and economics of improvements? Is that something that's done once or continuously? What does it mean to

consider risk reduction measures?

Does NRC plan to provide guidance for the economics of improvement after defining it? And what does this imply for licensees? Must backfit if someone can identify an enhancement? So flushing that out with more detail would be helpful.

So that's our comments on the Subpart C and again as Jeff indicated, this is preliminary and we will be happy to work with NRC on more details and provide more analysis and insights later. Thank you.

MR. RECKLEY: Okay. Thanks, thanks Cyril.

Just to kind of quickly go through some of those and again, appreciate the comments, coming up with the right language is always a challenge. And maybe a word or phrase that we use is, could be better developed.

But kind of quickly going through your short list of specific questions, contributing factors to unplanned events, we meant that in the broadest sense. And that was just because we gave a couple of examples, but they're not all inclusive of things that can contribute to an event sequence, in that what we meant, would apply to both those things that would address both consequence and frequency. Because that, we see both of those variables as being

important in how we were laying this out.

The same with plant control and safety system failures and maybe there's better language. But we just meant that you need to look beyond the performance of actual safety systems, since other systems, normal operating systems, control systems, could contribute to initiating events that then are part of the sequence that needs to be assessed.

But again, maybe there's better language that we could use. You've already talked about the PRA. As it's written, microreactors would be required to do a PRA. We had numerous discussions during LMP, the licensing modernization.

And we're generally hoping, I'm not a PRA guy, but we were generally hoping that microreactors or other designs that are simpler by nature, fewer components, fewer parts overall, would be able to still do a PRA. And by nature the PRA would be simpler, because the plant is simpler.

If that is not thought to be the case, then we can -- again this, the whole reason to put out the preliminary language and have these discussions is to make sure there's a common understanding. And that we don't need, we don't end up being overly burdensome if it's not required.

We are looking at guidance and the development of guidance perhaps as a supplement to this. If you go, and maybe we can quickly go, Liz, if you could go to the first backup slide. I hate to ask you do that, because it's at the long end of a line here.

But this, this slide -- and we've used this in previous discussions as well. And it goes somewhat to Dr. Kee's point that in the end, what we're interested in is the risk to the public, which is decided upon or determined by how much radioactive material is actually released.

And so we are looking to the degree that reactors -- and this is a simplified model of a mechanistic source term and it's reflected in some -- again, previous presentations. Also some reports that you'll find on the reference list within the advanced reactor's webpage. Both reports prepared by Sandia and Idaho on mechanistic source term, to see if there's a way that we could simplify the overall process.

Because in the end, if you are able to successfully contain the material, which is reflected in the inventory black box there, you should be able to kind of stop the process as soon as you

successfully prevented the release.

And so to the degree that we can start to, through either the mechanistic source term model, which is inherent within the PRA model, or somehow come up with either an alternative or perhaps guidance that says this is effectively the same. You still have to do an assessment of all of the initiating events. But in terms of how far you carry the sequence, maybe only carrying it -- and I think this was what we were thinking, but maybe it's not reflected in the PRA standard, you only need to take it as far from a regulatory perspective as the first success criteria in terms of retaining the material.

But anyway, we can go back now. I'm just, this is an opportunity and a discussion point that if the fear is that the cost of doing PRA is unwarranted and there's a cheaper way, a simpler way to do the assessments, that would be perfectly consistent with the Advanced Reactor Policy Statement and where we want to go, in that simpler designs, those with attributes that are identified in the Advanced Reactor Policy Statement, can get by with simpler analyses and simpler licensing, so long as they can demonstrate that you end up in the same safety space.

So, anyway it's good discussion. We'll

certainly talk about this internally. And we can talk about it, as you say, as you've had more chance to talk about it at the -- and we can bring it up at the February meeting.

And then the last part about state of technology, economic improvements, we'll actually talk about that under the Facility Safety Program in the next discussion. But the general interface here as you mentioned was just to make sure that whatever you do in the design and the analysis phase, the other subparts related to construction and operations needs to maintain the validity of those analyses and the functional performance of the plant features that have been incorporated into the design.

So, but on the last bullet, we'll get to that in the next segment on the Facility Safety Program.

So, I think with that I see it's ten till 2:00, so we're kind of running out of time on this. We have Marc Nichol, I think, has his hand up.

MR. BEALL: That's correct. Marc, you can unmute and ask your question or provide any comments please.

MR. NICHOL: Yeah, thanks Bill, can you hear me.

MR. BEALL: Yes, we can.

MR. NICHOL: All right, great. Thanks, this is Marc Nichol, Nuclear Energy Institute. I have very similar comments to USNIC's so I won't repeat ones that they may have. But I will start off with one that Jeff Merrifield made.

And just note that because this information was released on the 18th, before most people went on vacation, I haven't had a chance to really convene with our members on it, or even internally within my organization. So, I preface everything I'm about to say as my personal views and not representative of an industry position.

I would start out based on the whole risk-informed PRA conversation since it's been buzzing about. And I think it merits its own topic of discussion at a future meeting. The reason I say that is because I think everybody has a different perspective on what risk-informed means, and specifically what it should be in Part 53.

And so getting on the same page in terms of first, what does risk-informed mean, and then two, what do we want it to be in Part 53, is important. I will say, even within Part 50 and 52, a PRA is required. I don't imagine that we'll be able to get

away from, you know, not having any requirements for a PRA.

And I think generally most of industry is planning to have PRAs, even if somebody is looking at a very deterministic approach. They may have a rudimentary PRA. So I don't think the risk is in having, is in one, an industry wanting no PRAs.

But now that said, we should make sure the rule is flexible and within that, especially within this risk-informed approach. I sort of view what the NRC has been proposing is more of risk-based approach rather than what I would consider a risk-informed approach. And like I said, others may have different views on what those terms mean.

And I take that the proposals for QHOs in the rule, these very strict and prescriptive requirements on PRA, and I'm not saying that's a bad thing. It's just a different way to write the rule. And I think if we do that, we want to be intentional about it. I do think risk-based does tend to limit flexibility in what can be done. But that's just, you know, one thing to consider.

The other thing I'd like to say is that, just taking the totality of Subpart B, C and F, it seems to me, and I could be reading more into it than

what's there, or misunderstanding what's being proposed, but it really appears to me that the requirements that are being proposed for Part 53 are more burdensome and prescriptive than what's in Part 50 and 52. And it's a little bit counterintuitive for me, because advanced reactors are going to be simpler, have higher levels of safety, and rely more on inherent safety features, less on human actions. So you think that it would tend to go the other way.

And, you know, we, you know, another metric to that is there seems to be information being proposed in Part 53 rule text that to me would historically, or should, be in guidance. And so the increasing prescriptiveness is a little bit concerning to me. So, I just say that as another sort of broad comment to think though.

We did, in our comments on Subpart B, try to propose an alternative, which we think is aligned with the NRC's original proposal. But what we believe would be much more performance based, flexible, and easier to read.

The other thing I wanted to mention, I'm still trying to get through this information on Subpart C. It's complex and I'm trying to figure out how all the terms work. Some of them seem to be used

in a different way than Part 50 and 52. And I'll just take design criteria.

So, in Part 50, 52 those are general design criteria. They're in my mind, I sort of call them safety functions. They're not the fundamental safety functions, but they're, you know, they define safety functions for the plant.

But design criteria in Part 53 seems to be criteria for a particular design feature. And so that seems to be a lower level item within that design-flow process. And it's, you know, to me it didn't appear to be the same type of use of the term.

It's even not clear to me what design features mean. Are we talking about system structures and components that provide safety functions? It didn't appear to be the case, but, you know, that would be the more traditional use of that.

And then even the safety functions, they appear to be the fundamental safety functions, which is fine if that's how we want to structure it. But, you know, there may be this missing gap of what are the functions that the plant needs to provide to be able to assure safety?

And then within that whole construct, the way it's written up seems to be that design features,

and so this would SECs, are the only ways to accomplish a safety function. That's there's no -- that programmatic controls obviously support the -- you know, enable to do that with confidence.

But it didn't seem to allow for human actions to be able to fulfill safety functions. And I don't believe that's the intent, but that the way I read the rule. So I wanted to make sure you knew about that.

There was one slide in there that talked about the requirement to analyze fire, aircraft, a couple of other things, and my question is, well what if, for a given design a fire and aircraft impact aren't actually important? You know, why should we require these in a very prescriptive way? If we do it more performance based and, you know, those would be to me, those would events that you would need to analyze.

And so within the design process, an applicant would determine is a fire, is an aircraft impact, are those events that are important for me to consider in my design? Or are they consequences such that, you know, there's no potential harm to the public, so that I don't even have to design against them?

I was interested, and maybe we'll get to this in Subpart B, but you had a requirement in there for mitigation beyond design basis events. But if you already required the quantitative health objectives, I wasn't sure why we also need to mitigate beyond design basis events, that if mitigation is necessary, it would have been caught up in compliance with that QHO, so, that may be a topic for later discussion.

You had a question about safety related versus special treatment, and non-safety related. I tend to think we don't have to specify those terms, that we could allow different approaches by not specifying them in the requirements, and some may use those terms exactly the way you define them. Some may use different terms, or use them in different ways based on their approach.

But the reason I say I don't think it's necessary to use those terms in the requirement is based on our alternative proposal of the safety criteria where we talked about adequate protection, and extra-adequate protection. And if you then start to align various requirements around that, you can do it without having to actually use those terms, I believe.

You asked a question about inherent safety

features. I think these definitely merit further consideration. You know, whether they should be included or I guess addressed in the regulations, specially or not is a good question. I think it is possible to address them in guidance.

And in my mind, the difference between an inherent safety function, and I'll just say an active safety function, is in what types of programs do you need to be able to assure that that component will be able to satisfy its given function at the time necessary, at the time it needs to be relied upon?

And what additional defense-in-depth, or what defense-in-depth may you not need since it's inherent, that you might otherwise need for an active component?

There was some good discussion about security. I liked Steve Nesbit's discussion. I agreed with him. I wrote a note off to the side, is that the requirements for design should be focusing on the resulting design, or the design that is the product of this whole design process and the adequacy of the design itself as an outcome.

Certainly there is going to be a need for the NRC to have some assurance over the process itself. But we should really focus in on that minimum

amount of the process, the design process that the NRC needs to assure in order to have confidence that the resulting design is adequate. So, for example QA or design control, if designs change over time.

I was really curious about the requirement at the very end, I think of the PRA section, where you now require a deterministic evaluation of the design basis accident. And I was really curious why we would need that if you've already gone through a very probabilistic approach?

It didn't seem to be necessary. And this actually ties back to the conversation about, are we headed in a risk-based approach, or a risk-informed approach? And how do you allow flexibility?

In the way that it's been written up, I would think, you know, you've got the QHOs. You've got these prescriptive requirements for PRAs. They wouldn't need to do a deterministic, you call it complementary analysis.

But perhaps somebody that didn't utilize the PRA in such an extensive manner, perhaps they do need to have some deterministic analysis to give greater confidence, but there was a thought there.

So with that, I do also agree with Jeff Merrifield's comment about, we're diving deep into

different topics and not really seeing how it relates back to the big picture. This was one of the things we had flagged in our October letter and why we recommended a systematic approach.

I think we're starting to see the friction of not having that picture put together at the beginning of the project. We also provided in our last letter, project requirements, or success criteria which I helped, I think helped put together that bigger picture.

But I would also encourage, as Jeff did, having a discussion on how do these things fit together, you know, so that there's a much better understanding of where we're headed. That's the end of my comments. Thank you.

MR. RECKLEY: Okay, thanks, Marc; yeah, a lot of material there. We'll go back and look at those. And some of them we'll be talking about later when we get to the Subpart B discussions, so anyone else, Bob?

MR. BEALL: Yes, Peter Hastings, you have your hands up. Please unmute your mic.

MR. HASTINGS: Thank you, can you hear me?

MR. BEALL: Yes, we can.

MR. HASTINGS: Just a, this is Peter

Hastings with Kairos Power, and just a couple of complimentary comments to NEI's and USNIC's comments, but to emphasis a couple of points. And I'll be as brief as I can.

When there's two terminologies, and one of the slides, I forget which number, mentioned -- it was in the discussion of the evaluation of design basis accidents and the expectation that a limited set of events would be evaluated as design basis accidents under the traditional construct of using conservative assumptions, only crediting items that are safety related. And of course that typically also includes other provisions, such as applicability of the QA program, historically at least, single failure criteria applicability, and so forth.

So, when we're looking in other parts of the rule to expand the definition of safety, we need to be really careful. Because pulling things like occupational exposure in normal op, effluent release doses into the, unwittingly, I believe, into the definition of safety also risks increasing the regulatory burden dramatically.

I don't think the staff's intent, but I think paying special attention to the language that we use and the use of the label safety, safety criteria,

safety related and so forth, needs to be done very, very cautiously. That's my first comment.

Second comment on the language referring to the mandatory, those are my words, use of standards. By virtue of the language that at least was in the slides about standards must be used. I want to be similarly cautious. First of all, and I speak with a lot of experience here in the standards development community, consensus standards are not things that happen quickly. NRC endorsement of consensus standards also is not, typically not timely for things that are trying to evolve quickly and innovatively. And requiring the use of the standard, of a consensus standard that may have been developed five or ten years ago, actually directly discourages innovation, which I don't think is the intent either.

So, I'd recommend looking for different language that encourages the use of standards where they're available and applicable, but certainly not requiring them. And I think, or better yet, take that provision out of the rule and have it exist in policy and guidance space.

And then finally, my third comment, and this reiterates some of the comments you've heard, the mandatory use of PRA. We all recognize that today

many designs will use PRA. The language in 50 and 52 varies between strongly urging it and requiring it.

But we, this is an opportunity to take a step back. And again, this is mainly about language. Having language, having requirements in the rule for which PRA today is a logical implementation step certainly makes sense.

But I would hesitate to try to look ten years in the future and conclude that what we call a PRA today is a sufficiently, sufficiently stable and sort of bedrock implementation method that it makes sense to mandate it as a tool.

Let the PRA be the tool that implements what the regulatory requirement is around risk-informed solutions, not call out a specific analytical tool today as a regulatory requirement. That concludes my comments, thank you.

MR. RECKLEY: Thank you, Peter; anybody else, Bob?

MR. BEALL: Nobody has their hands raised. If there's somebody on the bridge line that would like to ask a question, or have a comment, please hit *6 on your phone, unmute your phone, and then introduce yourself, please.

Okay, not hearing anybody on the bridge

line. That concludes our discussions of Subpart C; I would like to take a break right now. We're a little bit over schedule, so let's take a ten-minute break and come back, or a little bit over ten minutes and come back at how about 2:20? Okay. So, we can get a little bit of time back.

So, we'll take a break now and reconvene the public meeting at 20 minutes after 2:00.

(Whereupon, the above-entitled matter went off the record at 2:08 p.m. and resumed at 2:20 p.m.)

MR. BEALL: So next slide, please. All right, so we're starting the second half of our public meeting, in which we'll be discussing the Facility Safety Program Section in Subpart F, Requirements for Operation.

Bill, can you lead us through the discussion, please?

MR. RECKLEY: Thanks, Bob. Yeah, we'll probably circle back before I start, circle back to this at the end of the meeting and follow on, but it's probably useful to mention it here, as we look forward to the February meeting, I think what we're thinking is that we'll give more time. It's probably going to be a full day meeting, and I think we can use that as an opportunity to have some of the more generic

discussions that both Jeff Merrifield and Marc Nichol mentioned.

That said, I think by both schedule, and maybe as it works out on purpose or by accident, this has probably been a useful approach because my experience has been until stuff gets put down on paper and people can assess it, without an initial draft of a document, we would probably just spend a lot of time talking philosophy. So I think this could still work out. At the same time, be open as Marc and Jeff mentioned, and we can talk at the end of the meeting about doing that at our February meeting.

So let's go to slide 33, and we'll talk about one element of Subpart F. For the February meeting, the other thing that we can say, we had said at the December meeting we would try to work out a more complete outline than what we've provided with the, kind of, simple text boxes on what the various subparts would address. We could do that by the February meeting.

Subpart F is the Operations part, Subpart, and the thinking is that this would have basically everything that addresses the operations phase. And so this is going to have requirements on technical specifications, other configuration control, elements

like Reliability Assurance Program. Also address staffing, and as Nan pointed out on the one slide, one concern that we have is, as we go forward on this schedule, we're going to be addressing topics that in and of themselves would usually take years to resolve, and we're going to have to come up with preliminary language and then follow that up with what the Commission and its staff requirements memorandum called at least a rudimentary proposed rule by the schedule that was on Nan's slide.

So areas like staffing and various proposals to reassess the role of operator licensing and staffing levels, with some proposals perhaps going all the way to unmanned micro-reactors. Those kind of things, like I say, would normally take a long time in a regulatory discussion to come to an approach. And we are going to have to introduce such topics and resolve them in months, not years, at least to the point of developing the proposed rule.

So as Nan was mentioning, on our side, that's a challenge to bring in all the staff, but we probably -- our task is probably easy in comparison to yours, to bring in the right expertise, the right staff, to get volunteers from various designers, various organizations, or whatever. So the February

meeting we can talk about that a little bit more too. So all that is background, and maybe I'm just trying to delay this discussion because I've already seen the comments.

So the part of Subpart F that we're looking to introduce is the concept of a facility safety program. And the notion for introducing that is us trying to look at the overall regulatory program, not just licensing, but start to think about what the overall program looks like.

The inspection program, our continuing assessment of things like generic safety issues, operating experience, and all of the infrastructure that the NRC has in place to support the number of reactor sites that number in the tens. And the number of reactor technologies that number two. And so you then have to look at what the landscape might look like ten or 15 years from now when there are many sites of smaller reactors and of a wide range of technologies.

And so if the mindset remains that upon licensing, the reactor is deemed safe and is static for the next 40 years, unless the NRC makes you do something different, then the NRC will have to develop that infrastructure to make sure that, where

appropriate, we can challenge and impose additional requirements. And so one alternative, and we looked at other agencies that regulate larger number of smaller facilities or smaller hazards, and said how do other agencies do this?

And one concept is the concept of a facility safety program, which in -- I'm not trying to beat around the bush, it puts a burden on the licensee to do more active, dynamic risk-management of the facility, and to, where appropriate, take measures to address new information. So that's the rationale. Again, looking at the bigger picture of not just licensing, but also into operations and how we might do things a little different.

So if you go to slide 34, this basically lays out that, the first 53.800 current preliminary number, would establish a requirement to have such a program, and put it on the licensee to periodically assess, periodically look for and assess new information in regards to hazards, or operating experience, or new technologies. The second bullet, to routinely evaluate such identified hazards, and consider measures to mitigate or eliminate the resulting risks associated with the new information.

Other sections of Subpart F under

operations, will address the actual, kind of, more traditional compliance-oriented configuration management of equipment. Tech specs would still include provisions for having the safety-related equipment available, and have actions to take if that equipment becomes inoperable, for example.

The reliability assurance program will, as we envision, would have provisions to monitor the reliability of equipment assumed to address event sequences and deemed to be non-safety related, but safety significant. So those things would still exist. This program's only looking at new information that would potentially contribute to risk.

So if we go to slide 35, and what we were saying in the notes, is we first talk about the general concept here and then we can talk about the actual criteria, although we did include some, at least, starting points in the preliminary language. But again, the goal is really to look at this as not those things that would be contributing to ensuring adequate protection, those are going to be in the compliance-oriented, things like tech specs, but to look more for measures that would be, under current language, cost-effective safety enhancements.

So the criteria, again, we can get into

specifics. They may need to be tweaked or just rethought, but the challenge is to try to come up -- in such a program, the challenge is to try to come up with criteria that have you enter the process appropriately, and that's where you have -- you want to make sure the bar is low enough, such that you're actually identifying new information to assess, but you also want to make sure that it's not so low that you are challenging and wasting people's time in assessing measures that you know won't be cost-effective.

So that's what we were trying to reach in the very preliminary criteria that we put in this first cut, which is for more frequent events, normal operations, that you have a fairly low threshold. And that was, again, in the proposal 2.5 millirem, and -- to an individual, and, collectively, a 5 person-rem to the population.

And the reason to -- and the 5 person-rem, it might not be the right number, but, again, the idea here is it has to be of sufficient value to even enter into the assessment. So 5 person-rem, roughly, at $6,000 a person-rem, that's $30,000, the thinking being if the added consequence doesn't add up to at least a number like $30,000, you can't even initiate

the process to consider a risk-reduction measure. So it's not worth the effort.

So that's what those criteria are trying to aim at. And the other ones related to those times where you take advantage of your safety margins to get operating flexibility, the criterion is set at 10, a reduction in margin at 10 percent. So that's basically what we were laying out.

If you go to slide 36, I know this looked ominous and resulted in some of the comments because this is the section that identifies the need to identify staff and have training and so forth. So we did use as a model the program from the Federal Railroad Administration, but I think if you look past the fact that it's a couple pages of requirements, most of it comes around, basically, to you have to identify your staff, you have to have training for them, and you have to do a periodic assessment of the program.

So if we go to 37, this was starting to get into the licensing part. This would interface with the licensing subpart, Subpart H, in terms of including a facility safety program as part of the application, the NRC approving the plan, and then we would have to work out, like any change control

process, the processes for evaluating changes and providing updates. So in a nutshell, that was the proposal.

The reason we thought we would introduce it, in my mind it's a little bit analogous to the tech spec improvement initiatives, at least in my mind, that we've been evaluating and implementing over the last couple decades, which took, basically, prescriptive requirements that had been previously in the technical specifications, and moved them over into a risk management approach that took advantage of the maintenance rule and the availability of PRAs and other tools.

And so, to me again, this is just an ability to take those similar tools and build it in to hopefully improve the overall regulatory program, in comparison to having a fairly prescriptive and static set of requirements, and then basically saying the process is those static things change only when the NRC goes through the process of doing a backfit analysis and imposing it.

So 38, I think, we can either open it up real quick for questions to me on the specifics, or we can just delve into the presentation, Bob. It's up to you.

MR. BEALL: Yeah, we have one hand raised, from former Commissioner Merrifield. You can unmute.

MR. MERRIFIELD: Yeah, thanks so much. Actually, I'm going to be presenting the next two slides on behalf of NIC, so I've lowered my hand and can certainly address that in the context of those comments.

MR. BEALL: Okay, so you're the only one that had their hand raised, so let's go ahead and go right into USNIC, please.

MR. MERRIFIELD: Thank you very much. And I want to -- I'm going to preface our slides by some comments and reactions of my own relative to the presentation that Bill just gave. And so before I turn to the official slides, I do want to make a couple of up-front comments.

I appreciate the thoughtfulness that the staff has undertaken in thinking about this exercise and incorporating these elements in the context of a Part 53. I think as we evaluate that, and as NIC is going to be responding, and others respond, I think it is important to go back to look at the basis upon which Congress passed NEIMA and its intention. And I think that general intention of Congress was to have the NRC prepare a risk-informed licensing program to

facilitate the licensing of advanced reactors and enable the deployment of these technologies.

And you can go back, you look at the testimony, you look at the legislative history, you look at the language, all is consistent with that program. While I appreciate it's the desire of the staff to have an ability for the licensing of these reactors not to be static, and while I appreciate the notion that by putting these operational issues in it's going to make things more efficient for the NRC, I would say several things in regards to that.

The first one is, historically, we have lived with the fact that, and the NRC has regulated the notion that once a reactor gets its license, that is the licensing basis of the reactor, and where the agency feels it's appropriate to make changes, it has to do work and it has to take actions to change that, including an appropriate analysis of the backfit rule. And the notion that we're simply going to take, and contrary to the Agency's efforts to reduce unnecessary burden, in this case we're going the opposite direction where we're putting more burden on the ability of the individuals trying to license a reactor technology, to meet these new proposed requirements, which are not there now.

Having that level of detail in a rulemaking which is intended to license these reactor technologies, certainly adds commensurately to that burden and will make it more difficult for the advanced reactor developers to get through that wicket. I think that is contrary to the intention of Congress, and further, given the expedited time line that has been outlined by the Commission, I think a considerable amount of time and effort could be avoided on behalf of both the agency and the applicants and commenters on this Part 53 effort, if this were not to be included. And so my personal gut reaction is that this is taking things in the wrong way, well intended, but I don't think this is consistent with where Congress was intending the Agency to go in crafting a new Part 53.

With that, let me go to the NIC comments. Next page, please. The first comments on this is certainly intended to get a better understanding of what you all are attempting to accomplish. I think Bill Reckley outlined a bit of that, and I think as a group, NIC and its advanced reactor developer members is going to have to go back and assess in more detail our reaction to all of this. I don't want to speak for the group as a whole. That may -- it's certainly

possible they may have a different reaction than I gave you for my own personal comments, but certainly we will endeavor to go ahead and try to craft more detailed comments for you.

In terms of the specific comment below, we do not believe this is a performance-based program, and we do believe it's prescriptive. And I think this is consistent with my comments prior. We are concerned about the potential for increased regulatory uncertainty and regulatory burden, and we are quite concerned about the potential adverse impacts to the backfit rule.

Next slide, please. Can I have the next slide, please? In terms of the safety program performance criteria, we just see no prior precedent for this program, and I don't think Bill's comments indicated that. I think you were looking at other programs including some from the rail industry. We think it could create a number of problems, duplicative paperwork, including the regulatory updated -- burden -- updating this document, as well as the FSAR.

We think it brings into question the issue of reasonable assurance when the license is granted, and we don't think it's feasible to continue to be

revisiting these issues on decisions that were made back in the design process. As indicated, as I said before, we think this is inconsistent with streamlining regulations. We would certainly like to get additional understanding of where you're coming from. We got some of that today.

Again, this may be a topic that would be helpful in a workshop-like program. Better understanding of the scope for maintenance and how this applies to current fleet, I think Bill did go into that somewhat. That may be an area that we need to poke a little bit more. And, you know, we certainly need to have a better understanding of what the mechanism would be where licensees would assess new information and be required to make plant changes to address them. And, again, Bill outlined some of that today, but I think having a better understanding would be helpful.

With that, I believe NIC's comments are complete. Thank you very much.

MR. BEALL: Okay, thank you. Does anybody have any questions for the staff? Please raise your hand.

Okay, Marc, go ahead. Unmute yourself, please. Marc Nichol?

MR. NICHOL: Okay, can you hear me now?

MR. BEALL: Yes, we can, thank you.

MR. NICHOL: Okay, great, thanks. Marc Nichol, Nuclear Energy Institute. Yeah, I, again, similar to my earlier comments, these are only my thoughts because we really haven't had a chance to talk about them.

But I would start, it's a novel new idea, and despite the fact that it appears to put a lot of burden programmatic-wise on the licensee, I want to be open-minded to understand this approach. So I'm not trying to shoot it down, although, as Jeff mentioned, as we deliberate, we may come back and say we don't like this for some reasons. But I wanted to start with questions because I have a lot more questions than actual opinions, and two main questions.

The first one is what problem is being solved? I know, Bill, you went into it a little bit by saying the difference is having essentially one type of reactor, a large light water reactor, and even though we have 100 reactors, the number of facilities are relatively small, in the dozens, versus where we're going, which could be, you know, a dozen or more different types of designs, and if we're really successful, and especially if they're smaller, then we

may have hundreds and hundreds of these facilities.

So I do get that, but -- and I see the benefit to the NRC by relying more on a licensee to do some of this work in terms of evaluating new information, but I'm not seeing the value or the benefit to the licensee. So that's the second question, is, you know, not only what problem are you solving for them, if any, but what's the overall benefit, especially to the licensee?

So, for example, are you able to eliminate event reporting, which is under 50.72 or 50.73? Are you able to eliminate the need for the NRC to operate a generic issues program? What types of things there is going to be an offsetting benefit? Because without a benefit, not just to the NRC, but also to the licensees, there's not going to be an interest to change because what we do currently under Part 50.52 already is adequate.

So there's already the licensees under Part 50 have to review operating experience. The NRC already has a process for imposing new rules, orders, and rules on licensees for different things. So it's not that we don't have this in place already, it's just a different way of trying to do it. So it would be interesting to know what's the potential benefit

there, especially if we're able to eliminate things that are doing.

And what might help there, actually, is to run through how it would, how things would be handled under 50.52's process, which could be carried forward to 53, or under what you're proposing for this facility safety program, so we can better visualize what the differences are. So, for example, generic case issues like Fukushima or the central eastern earthquake. Generic issue, I think it's 191, that's the suction material stuff. How would those be handled differently, and so we can better visualize the benefits.

The other comment I want to make, and it's really designed to -- or it's really focused on the regulatory philosophy, and you'll see it again as I talk about ALARA later, but I'll focus it here on the facility safety program. It appears to me to be driving to ever lower risk and ever increasing safety. And that's not what I think the regulatory philosophy should be. I think the regulatory philosophy should be focused on what is safe and making sure that things are safe according to what safe is.

And so if we look back at Section B, Subpart B, the safety criteria, we have the 25 rem for

accident conditions, we have those criteria 100 millirems to the public for normal operations, those sorts of things. That's defining safe, so why do we have to be safer than safe? I agree that it's a good thing to do, but from a regulatory perspective, isn't safe, safe?

And so isn't it enough to just make sure that the plants are meeting what is safe, and, you know, you could encourage them to be safer, but to actually require them to be safer, even with these economic checks in place to be able to screen some out that aren't economical. There is the overall cumulative effect of regulation, and so as you go through these individual situations where, okay, I'm driving to levels of safety that are way below what's already been determined as safe, and there's a cost that was justified based on that, but when you aggregate all of them together, there's largely an increase in cost.

And I know that the NRC may not consider this very much, I do believe you should, but the industry is in business, and so these have to be cost effective. Now if the costs increased just to be able to reach what's safe, okay, I'm not going to complain about that. We have to be safe; I agree.

But if the costs are increasing to be more than safe, then that's where I think there's a disadvantage, and actually, for nuclear, you're actually pricing nuclear out of the market, which is not just being a nuclear enthusiast is a bad thing, but recognizing that the world needs nuclear power to reduce carbon emissions, it actually has a negative societal impact. So I just want to, from a regulatory philosophy, I do want to get that across, and I'm hoping that others can agree with me on that. But I do think it's an important point to talk about. That's the end of my comments. Thanks.

MR. BEALL: Okay, thank you, Marc. Bill, do you have anything?

MR. RECKLEY: Yeah, I'll give a little feedback to that, and this is a little bit speculation. Obviously, I can't say that the NRC will, down the road, be smaller and do everything that you mentioned in order to reduce the annual fee. And in the end, that's how a payback for this program would come about.

Is that, the way I was looking at it, and I'll talk first-person here, was that this is an enabling requirement. And I'm not trying to dance around, it's a requirement, it is. It's putting a

burden on the licensee, on a prospective licensee.

But the enabling part is if this were in place, as we then develop reporting requirements and other parts of our inspection and oversight program, as we look at even natural hazards, this stuff gets subtle. And I know it's kind of hard to talk about, but keep in mind when the NRC staff is looking at a hazard, if you basically are telling the staff identify the hazard, and it's fixed in place for the next 60 years unless you're able to do a backfit justification. And we all know what a challenge that is.

Is it a wonder then, how much time, effort and discussion goes into agreeing to the hazard? Because the staff has one shot for 60 or 80 years to identify the hazard for a facility. So just, again, that's a subtle point. But just keep in mind the unintended consequences of a static approach.

But going to your specific point, Marc, again, I was looking at this as an enabling requirement because if it's not in place, then as we go forward out of Part 53, and also start to develop the other infrastructure, we're going to have to assume that it does not exist. And, therefore, we will need the same generic safety issue program,

similar reporting requirements, and so forth.

And so we'll have to start to build that, whereas, perhaps, and I don't want to over-commit or over-promise, and it needs work, I know, if we had such a program, could it serve part of that purpose? So that was the thinking. But I see Peter's hand is up, so we can move on so we can stay on schedule.

MR. BEALL: Okay. Actually, the next -- Ed raised his hand first, so, Ed, can you go ahead?

MR. LYMAN: Hi, yes, can you hear me?

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

MR. LYMAN: Great, okay. So I was wondering if the licensee is going to like this idea so much. You know, France has gone to a regulatory regime, I believe, where the reactors have to undergo a review every ten years of, I guess, their design basis, and implement safety upgrades at that time.

So I think if the problem you're trying to solve is to address the temporal changes and that it could affect safety risk, that you might consider that as an alternative to this, simply having a ten-year review of the hazards and the design basis, and then require implementation of all cost-justified safety significant enhancements. That's my suggestion. Thank you.

MR. BEALL: Okay, thank you, Ed. Bill, you ready to move on to Peter?

MR. RECKLEY: Yeah, or I'll let you control the order.

MR. BEALL: Okay. Yeah, I'm keeping a running list. So okay, Peter Hastings, go ahead, sir.

MR. HASTINGS: Thank you, Peter Hastings, Kairos Power. And I'll try not to be too repetitive. I echo Jeff's and Marc's comments. And, Bill, I will say that, like Jeff, we appreciate the explanation and acknowledge the good intentions here. And like Marc, I don't want to dismiss the idea out of hand. It's frankly something that we just haven't had a chance to think about a little bit.

I'll be honest that at first blush it looked like a solution looking for a problem. The notion of requiring a constant revisiting, or a constant search for additional risk reduction, seems to constitute an erosion of regulatory stability. I'll also observe it seems to, rather conspicuously, not refer to the opportunity to relax requirements based on this kind of a, sort of, ongoing program.

Your follow-up remarks, Bill, in response to Marc's comments, I think are really useful, and so I do think this is worth looking at it in more depth,

because I think what you're trying to get to could be helpful. I'm frankly a little skeptical that all of the infrastructure elements you were talking about doing away with would actually go away, but maybe, and I think there's some merit in looking at those kinds of things.

As we do this though, I think one of them, and Marc touched on this, I think, really eloquently, it's an important consideration, sometimes these discussions can send the message that a reactor can never be safe enough. This kind of approach can easily be perceived to increase regulatory instability. And despite advanced reactors expecting to increase safety margins compared to the existing fleet, in some cases by orders of magnitude, when by any objective measure, the existing fleet is already among the safest form of electricity production that exists.

So again, a little bit of balanced comments back and forth. I do think some additional discussion on this is warranted. Thank you.

MR. BEALL: Okay, thank you, sir. Bill, you have anything to say?

MR. RECKLEY: No. This is -- I'll be honest, we expected this. I will ask that people also

look at the criteria. The first objective is to identify and address new information. When you get into the second step of actually saying when do you need to do a risk-reduction measure to address the new information, that's, I think, where you get into the criteria and where we can have a lot of discussion, even if the program remains in the preliminary language. So I'll leave it there so people can look at that aspect as well, whoever is next, Bob.

MR. BEALL: Okay. Commissioner Merrifield. You can open your mic, please.

MR. MERRIFIELD: Yeah, I just want to make one comment. Luis Reyes, who is the former Executive Director of Operations, and I presented on behalf of the NRC at the third Nuclear Safety Convention in Vienna a while back. And an area that has been a long-standing difference is between the French and the United States approaches to regulating reactors.

And as was noted earlier, the French do have a program which requires a ten-year periodic safety review which can result in additional requirements for operating reactors. That is an approach that the Nuclear Regulatory Commission has systematically rejected. And the Commission has systematically gone the other direction on that approach.

And so I think in context of long-standing Commission policy, I think this particular proposal needs to be evaluated very carefully because of the impacts that it could have on long-standing policy views, of which Luis and I had to robustly defend in that particular convention. Thank you.

MR. BEALL: Okay, Thank you very much. Marc, I see you're next, so please unmute your phone and go ahead. Marc Nichol?

MR. NICHOL: This is Marc. Sorry, I muted. I didn't know I was unmuted, so I muted and then unmuted.

I was just following up on Bill's last comment in terms of taking a look at this and there's the requirement to assess, and then there's a requirement to take an action based on that. And part of my comment on this regulatory philosophy of making sure that we're safe, but not regulating ever lower levels of safe because safe is safe, in part it relates to that criteria. So I think there's a criteria of 2.5 millirem to an individual, or 5 person-rem is sort of the threshold, and if it's above that then you need to -- you might need to take an action.

And that's really where I was concerned as

well. I could understand if it's a matter of this new information is now you're violating one of those safety criteria, so now you're over, just pick one, you're over 100 millrem dose to the public, then I can see you need to take an action there. But if you're down at, let's just say your normal operations is down at 10 millirem, and now you're exceeding, you know, going up just a little bit from that, it really seems punitive for a plant that's so low already, or below the level of safety, to have to take extra actions to be safer than safe.

I think, you know, I just wanted to reiterate again. I think the focus needs to be on safe, not safer than safe, and always safer than safe, what we were before then. Thank you.

MR. BEALL: Okay, thank you, Marc. Bill, do you have any other comments?

MR. RECKLEY: No, just again, I appreciate people giving it some thought. And we will, I'm sure, talk about it in future meetings.

MR. BEALL: Okay, great. If there's anybody on the bridge line who would like to have a comment or say something, please send us a quick chat in the chat window.

Okay, with that, we will move on to the

next slide, please. Okay, so this will be recap of our November 18, 2020, public meeting on Subpart B, and Nan Valliere will be leading this session of the public meeting. Nan?

MS. VALLIERE: Thank you, Bob. Starting on this slide, slide 42, I'm going to briefly go through a summary of key comments that resulted from the November public meeting, which focused on the safety criteria in Subpart B.

I want to note that these slides do not include all of the written comments we have received to date on Subpart B. They focus on the comments from the public meeting. And I know we will be hearing more on many of these comments in the presentations that follow this one, so I will very quickly step through these few slides.

This first slide just lays out the various sections of Subpart B that were discussed at the last meeting. Next slide, please.

On slide 43, we have the first of three slides highlighting the comments that we heard. The key topics of interest included the adequate protection standard, where commenters indicated, first, that the NRC should avoid regulations that are not needed to provide reasonable assurance of adequate

protection of public health and safety. Second, that using the qualifier of reasonable assurance can erode public confidence, and, third, that addition of some text to the rule language to help clarify exactly what reasonable assurance of adequate protection means would be helpful.

We heard comments that flexibility is important to allow applicants to use different approaches to define their safety case. Some commenters suggested that the NRC consider using site boundary as the location for assessing dose in the first safety criteria, as was done in the emergency preparedness rule, instead of using the exclusion area boundary.

Some commenters were concerned about the use of numerical probabilities in the rule language and suggested that the NRC consider replacing them with qualitative probabilities. There were also suggestions that the NRC clarify how the rule addresses specific licensing basis event categories. Next slide, please.

In November, we heard several suggestions related to the treatment of beyond design basis events, including that the NRC consider focusing such requirements on mitigation, as is being done for

operating reactors. We also heard many comments questioning whether inclusion of the quantitative health objectives from the NRC safety goals was necessary.

Several commenters questioned whether the inclusion of a provision to address additional requirements established by the NRC for ensuring reasonable assurance of adequate protection was necessary. Some commenters found the two tier concept to be overly complex. Certain commenters questioned the need to include requirements to maintain doses as low as reasonably achievable, or to include a requirement for limitations on effluent releases during normal operations. Some stakeholders asked if Subpart B could be less prescriptive. Next slide, please.

Some stakeholders expressed concern that use of certain terminology might make understanding the rule more difficult for the general public. Plainer language was encouraged. Some expressed concern with the perceived deterministic nature of the requirements for defense-in-depth. Certain stakeholders stated that the NRC should avoid use of the term high confidence in the rule language.

Some suggested that the NRC should remove

requirements for occupational dose from the safety criteria. And finally, some stakeholders did not believe Part 53 should include reference to Part 50 Appendix I, but should instead, pull out and copy over any needed criteria from that appendix.

So that concludes the summary of the Subpart B comments from the November meeting. And at this point we're going to turn the meeting over to the U.S. Nuclear Industry Council, which will have several presenters provide some of their thoughts on Subpart B.

Cyril, are you prepared to begin the U.S. NIC presentation of Subpart B?

MR. DRAFFIN: I am. Yes, thank you very much, Nan. So the plan is to cover five issues that we think are particularly important that you covered. The first one was on the top of slide 43, and that deals, if you go on to the next, with adequate protection standard, defense-in-depth, qualitative health assessments objectives, quality assurance and performance-based risk regulations.

So we're going to have five presenters from industry to give you, kind of, in-depth assessment of each of these things. So if you go on to the next slide, which is slide 48, Frank

Akstulewicz will elaborate on adequate protection and our perspectives on that. And this is based on a discussion we had with multiple developers. We met two times over the holidays, and so this is not just one person representing it, but a variety of inputs from our developers.

So, Frank, over to you.

MR. AKSTULEWICZ: Sure, thanks, Cyril.

First of all, I want to appreciate the efforts that the staff has underway to try to integrate all of these comments into one meaningful regulation. I know it's particularly challenging. The subject that I'm here to talk about, and I know Nan has gone through some of the comments, and some of these key points are repetitive to the comments that were made previously.

And so we don't know the direction that the staff has gone with respect to modifying Subpart B, but I will note that getting the adequate protection standard right for Part 53 has to be the central focus for this particular rulemaking. And if we don't have a clear standard for what is safe, you've heard some of the ongoing discussions about how much more is safe enough, or why are we doing what we're doing. You know, how does it integrate into a

general program for assuring overall safe operations?

So just a couple of key thoughts. Again, having a clear standard for what constitutes adequate protection is essential. The rule starts out by predicating that the standards have to be focused on assuring certain fundamental safety functions. We think that that's a great thing, but then again, how the other requirements establish or relate to a nexus to that adequate protection standard, is part of the question that we have.

And we hope that as part of the ongoing discussion, we talk about how this adequate protection standard is independent of the technology selected, the reactor size, or the selected licensing process. And, you know, we're still not sure in terms of how this is going to integrate or be separate from the licensing processes of Part 50 or Part 53, in terms of whether or not a decision about licensing will be only predicated on information provided under Part 53.

And my -- this is my opinion, based on some of the discussion today, I'm getting this picture that the staff is trying to translate much of the necessary requirements from Part 50 and Part 20 and Part 52 into a process that will be unique to Part 53, and therefore will be stand-alone. And I don't think

that that clarity has been really discussed up to this particular point in time. And maybe I even have it wrong.

Just another major point, and we've heard a lot of this discussion today. This is not the opportunity to try to add requirements to reactors that are already safer than the current fleet of reactors. Now, we need to have a common standard for what is considered safe, and if that standard is met, that should be sufficient.

There's this discussion about whether beyond-design basis or not is necessary, or should we expand the rule, I meant, you know, to include minimizing danger and protecting property to that particular provision of paragraph 200. It's still not clear why that is necessary, and why the QHO criteria are absolutely necessary to establish, or to be requirements for establishing adequate protection, or a safety construction. So we are concerned about challenges to the backfit rule and backfit process that some of these processes could portend. I know Jeff talked about it a little bit when we were talking about the Section 800 concerns.

But I want to go and specifically point out something that may not be apparent, and it gets to

some of the first standard. And that is, under Section 220, if you look at paragraph B, right, it defines having a consequence of less than or approximately equal to one in 10,000 years, right? So that would mean that licensing basis events above 10 to the minus 4 would be subject to the following dose criteria, right? And that is 25 rem.

So what that means is that from an adequate protection standpoint, AOOs could -- have those consequences up to 25 rem, and still meet this provision. So, again, I want to make sure that you understand and appreciate the significance of the construction of the language and how you define licensing basis, and how that licensing basis definition is applied throughout the set of regulations.

The last thing that is on the slide here is Part 53 should establish the minimum. And that is, going in, essentially what Part 50 established when it was structured back in 1979, I believe is when it was originally set up, or maybe even earlier than that, 60-something. The idea was to not pile on a whole bunch of criteria at one time, but to establish what the minimum regulatory load would be, and then to ask for the information that was appropriate in

establishing the criteria -- that the criteria are being met.

So we don't want to suggest that it's a bad thing to have regulatory standards. It's a good thing, but it should be established at the minimum requirements, not anything more.

And the last thing, and it's kind of an over-arching comment about the rule going forward, and that is the process for demonstrating that the requirements are met should not be defined in a rulemaking. This gets to the flexibility question, which is if a licensee can demonstrate that the standards for adequate protection are being met using some process other than PRA, just to pick one, or some other facility safety program for another, then that should be good enough.

And so I think that's kind of where we'll stop. And I think those are the high level considerations that we wanted to kind of bring forward again and repeat the urgency of making sure that the staff is listening to what we're trying to bring forward.

MR. DRAFFIN: Thank you, Frank, appreciate that. The next topic on the next page is defense-in-depth, and that was referred to on, I guess, slide 45,

the second comment. And we're going to have two slides on this, and it will be presented by Dennis Henneke.

So, Dennis?

MR. HENNEKE: Okay. Thanks. Again, Dennis Henneke with GE-Hitachi. I did want to give a little bit of background on the defense-in-depth. GE-Hitachi has been involved in the licensing modernization project and we have performed LMP evaluation for several plants and have done the defense-in-depth evaluation for LMP.

And as far as defense-in-depth, we understand, under LMP, what that looks like for an LMP application. Although, I would say, for an application itself, it may look slightly different, and we are currently applying that to the TICAP program. And it is an important aspect to any risk-informed, performance-based application. I understand there were comments earlier about being risk-based, but there are several aspects of risk-informed and performance-based, and one of them is demonstrating adequate defense-in-depth.

And so we think, with regard to a safety case, that it really needs to be looked at a little bit further and not rely entirely on NEI 18-04 under

LMP. So I think we need to have further conversations about that to understand what it means to have an adequate defense-in-depth and areas of prevention and mitigation.

I saw that slide earlier on the defense levels and barriers. That's just a diagram that shows -- Bill presented one aspect of defense-in-depth, and I don't think that -- I think you'd rather have something that defines what defense-in-depth is versus requiring something very deterministic with regard to defense-in-depth, such as showing barriers and containment and so on.

But, in regard to this, what we are talking about -- and Bill mentioned to it earlier -- that the reactors have unique designs and they may be presenting defense-in-depth, or have a defense-in-depth that is unique, either due to the use of passive reliability or design features, such as the fuel type, that give you a different viewpoint of what defense-in-depth is. It wouldn't always be, you know, the fuel, the vessel containment, and the safety system. So, it may look slightly different.

So, we're just trying to open the conversation up to understand what that looks like and to try and maybe establish some conversation to what

that looks -- what adequate defense-in-depth is, and may need to develop some guidance on that.

So, on the next slide we open up the question -- the types of questions that you may want to look at as, you know, is defense-in-depth multiple barriers or, for design basis events, do we really -- do we need to look at beyond design basis events? I heard a question about that. How does that apply?

You know, what are we trying to accomplish with defense-in-depth if we're really going with risk-informed performance-based? Is it really to show the adequate risk-informed, you know, PRA results and meeting the QHOs and so on?

And so we're looking for a little bit of clarity in starting the conversation about what the NRC is really trying to accomplish, and then how does a licensee translate what's trying to be accomplished into an application. Of course, we recommend, you know, following on what we're doing in TICAP because we'll have something on that shortly, but that TICAP application we're presenting is really just one plant's approach to it, and another, different type of design may have a different type of argument for defense-in-depth.

And, lastly, back to the previous point,

you know, on the inherent features of a reactor, I think Bill mentioned that earlier, that may give you a different defense-in-depth argument. But what if you had reactors that do not have a large amount of radioactivity that could be released offsite? What does defense-in-depth look like?

So, it's a challenge for us, but we'd like to start the conversation with trying to understand it better and maybe move this into a workshop discussion at some point. So, I appreciate it. Thanks.

MR. DRAFFIN: Great. Thank you, Dennis. And NRC had asked us to cover all five topics at once, and then NRC can, you know, provide comments if you wish. The next one is on quantitative health objectives. That's, I guess, mentioned on Slide 44, the first comment. And we're going to hear from Rebecca Norris from NuScale.

MS. NORRIS: Hi. Yes. Good afternoon. This is Rebecca Norris. Can everyone hear me?

MR. DRAFFIN: Yes.

MS. NORRIS: Awesome. Thank you. So, Nan summarized her concern in her introduction, and I understand, as Marc mentioned, that NEI is also considering recommendations for 53.230. So, this is compiled with USNIC separate from that.

So, we noted in the draft 53.230(b)(2) that there is a codification of the quantitative health objectives. I was not lucky enough to have been around for the history of this topic, so I had to look it up. I found the IAEA reference in that middle bullet very enlightening.

For the benefit of anyone else who's in my shoes, the term "QHO" is not to say that the rest of 53.230, CDF, the core damage frequency, or large early release frequency, are not quantitative. It was just the original term coined in the 1986 safety goals.

The 1986 safety goals have been in practice for quite a while, but they actually have not been codified explicitly yet. So, if this draft were codified, that would be the first time it was done for these safety goals.

The rest of the dose limits in 53.230 parallel the requirements of Part 50 and 52 and those in 10 CFR 20.1301. So, our concern really centers around the fact that this would add a large burden associated with this approach, especially compared to the expected very low releases from advanced reactors; i.e., the lower risk with advanced reactors.

Also, specifically, it appears it would need to be performed at each site and possibly redone

over time as population changes, with how it's worded right now.

So, we have two specific questions. Our first question is general. We would be interested in the reasoning behind the addition of the QHO requirement on top of the, quote/unquote, normal requirements in 53.230, as there might be a less restrictive way to meet the same goals.

In the spirit of not presenting a problem without a possible solution, we believe that 53.230 gives adequate public protection without paragraph (b)(2), which is the QHO requirement.

Additionally, I understand the NRC's Office of Regulatory Research has conducted studies similar to what would be required by (b)(2) for each existing LWR generically, and this could, and should, be continued for new applicants.

Our second question is: if the QHO codification is retained, what is the objective in the slightly modified wording from the original 1986 safety goals? I believe the original goals were 0.1 percent increase in the risk above the existing risk to the population, and that's been slightly modified to that listed in my first paragraph there.

So, those are our two questions, and

that's all I have for you today. Thank you.

MR. DRAFFIN: Thank you, Rebecca.

The next topic is QA. And we think that Part 53 provides an opportunity for the NRC to take a fresh look at Appendix B, NQA-1 program, the ASME standards, and consider alternatives.

Since that was adopted, the level of quality of commercially available components may meet and/or exceed the nuclear standards without the need for burdensome reporting requirements. We recommend the rules should state that quality control is necessary, but not provide directions on which approach to use.

Now, the guidance, which we think is necessary, could then indicate some of the alternative approaches, such as the ISO 9000 series, IAEA, the commercial dedication programs, and other approaches presented by industry. And that would have a number of advantages.

One, it moves toward an international acceptance. We hope that these reactors will be sold, the U.S. reactors and others, internationally to reduce climate change worldwide, not just in our country. And if you have some consistency among the approvals of the requirements for quality assurance,

that would be helpful in getting it done, getting it certified, and then certified and used in multiple parts of the world.

If you go down that path, you could also, you know, extend and broaden the scope and maybe get universal acceptance of codes and standards to mechanical or electrical, other things other than just QA.

And as you do, this should be deployed to show how these standards for ISO or IAEA can meet whatever requirements there are in Part 53, and potentially other NRC parts as well. So, that's our comments on quality assurance.

I did, since you had mentioned protection of workers, I did want to just reiterate what we had said before, that we recommend occupational safety not be included in Part 53. And we've had dialogue on that earlier today.

Our last topic for Subpart B is risk-informed, performance-based regulations. And we have two slides on that and we have a tag team of people form two different companies: Travis Chapman from X-Energy and Ross Moore from Oklo. So I turn it over to both of you for discussing this broad and important issue.

MR. CHAPMAN: Thank you, Cyril. Could you nod your head if you can hear me?

MR. DRAFFIN: I can.

MR. CHAPMAN: Excellent. Alright. I was asked to carry the message on the use of probabilistic risk assessment in the risk-informed language that was in Part 53 that we reviewed. I have a variety of developers and other applicants that have a differing range of design maturity, of the safety cases that they're following, of the licensing pathways that they're considering. And so we -- we elicit a lot of responses in this particular area.

I would say, personally, when I read through the language, I viewed it from the perspective of meaning what is required and how can I demonstrate compliance or that the requirement is met, and trying to think through what are the implications of the language as proposed.

So, a takeaway we had is that, in reading the Subpart B language, we certainly want our regulatory framework to be risk-informed. We don't want to lose the benefit that that has provided to this industry. But, at the same time, we're also concerned that it not become purely risk-based, making it challenging to meet requirements at differing

levels of design.

In the reading of the language in Subpart B as it is, it's certainly apparent that NEI 18-04 could be used as a mechanism to meet that. It's hard to understand is there a method of meeting the language as is without using NEI 18-04, just given how much of that language and that framework is already kind of seeded into the languages there.

We think that, depending on the design stage and the developer, the type of design, and its safety case, there's certainly deterministic approaches that could be appropriate for them to use, certainly in the areas of external hazards assessment, some of the seismic analyses, providing bounding analyses; in some cases, maybe early on, it may be appropriate for that licensee or that applicant to approach the NRC to get feedback on safety findings. Given the size of hazard that may be perfectly appropriate. And the effort of going through detailed PRA analysis at those early stages may not provide as much value to the reviewer to risk-inform the review.

The advanced non-light water PRA standard exists right now. That was on my mind as I read this, thinking the standard is providing me a mechanism of developing that PRA. But I would say that standard

and its use is still maturing. There are limited examples right now of acceptable cases across the different designs, the application types, the level of maturity, to really think through the implications of using that PRA standard to develop the risk information necessary to comply with the proposed Part 53 language.

So, I don't have them listed here as questions, necessarily, but some things that the developers were discussing just trying to get an idea of initial thinking about how the NRC view PRA development through a design cycle, including the capability of the PRA and how it would be delivered in terms of the license application.

Would it simply be insights? Would it be full PRA? Fault or event trees, event sequences, different information that may be required that maybe hasn't been before, and how does that relate to past precedent from Part 52 for expectations of PRA in applications?

If, as has been discussed kind of earlier, the idea that LMP wouldn't be required to comply with Part 53, how would an applicant meet those risk-related requirements, things like licensing basis event, frequency bins, especially in maybe a

preliminary stage of design information that may have significant uncertainty, thinking about how would you be able to show compliance with that requirement without having that framework in place.

And, lastly, and it's a bullet at the end, many applicants are considering international markets. There are other regulatory frameworks that we're trying to make sure that the designs can fit within, the IAEA-specific safety requirements or markets that have dual requirements for deterministic and probabilistic safety assessments.

And we're trying to think through, in complying with Part 53 as it's developed, how are we making sure that we're preparing to reduce the additional effort of meeting some of those other market requirements? And to what degree is the language, is that the thing that's going to be produced, or the way that we go about demonstrating compliance maybe compatible with multiple market regulatory frameworks?

And I will pass it off to Ross to talk about the performance-based elements.

MR. MOORE: Hello. So, in addition to risk-informing the regulations, I think it's also important that the requirements also be appropriately

performance-based and ensure clear interpretation of those requirements. And our review of Part 53 Subpart B proposed language offers several examples where requirements could lead to uncertainty.

Clear performance-based criteria can allow designers to be flexible in how they implement design features, programmatic controls, or other approaches while improving predictability in the review process. Determining those performance-based criteria should also be specifically based on those requirements necessary to ensure adequate protection without escalating the quantity and scope of criteria beyond that protection. And that goes back to what Frank had previously mentioned about not ratcheting up requirements.

Performance-based requirements should specifically set measurable outcomes, such as dose goals, that allow an applicant to establish design criteria for a subsequent material or system testing that demonstrates a system or component as performing the way it was committed to perform, without prescribing the methods required to get there.

A good example of clear and measurable outcomes could be that proposed language in 53.220(a), which calls out measurable dose criteria based on

previously determined safety requirement.

An example that is markedly less clear would be 53.220(c), which uses the phrase, and I quote, "additional requirements established by the NRC for ensuring reasonable assurance of adequate protection of the public's health and safety maintaining common defense and security."

This language is open-ended, difficult to interpret, uses terminology that isn't formally defined, and that could ultimately result in a moving target for an applicant to meet, especially depending upon, you know, a reviewer or technology.

So, that's for performance-based. And then some other considerations: tangentially, the Part 53 performance-based requirements, as written, Part 53 draft language -- and this has obviously been previously mentioned -- appears to rely heavily on NEI 18-04, making it almost an implicit requirement. While efforts of the LMP should not be ignored, Part 53 should accommodate the implementation of LMP rather than requiring it.

Performance-based, risk-informed regulations offer an opportunity to utilize risk to right-size the regulations using risk insights and determining appropriate level of requirements that

should apply based on the safety case of a design.

And then using performance-based language should offer an applicant flexibility in how to demonstrate that compliance.

Additionally, a properly implemented risk-informed, performance-based regulation should be technology- and design-neutral, minimizing the need for exemptions.

And then, lastly, the development of Part 53 should consider the overall impact and level of detail requirements for perspective applicant types. Specifically, not all applicants will be coming in with the same purpose or with the same level with the design review maturity, depending upon the application. And that expectation should not be limiting in the language and requirements of Part 53. I know the content of applications has not yet been specified, but that would be the concern there.

Additionally, Part 53 is an opportunity to reconsider the language and framework and how it impacts applicants coming in under those variety of pre-established application approaches, like Part 50 or Part 52, or potentially innovative approaches should they consider it.

That's all I have there, Cyril.

MR. DRAFFIN: Okay, Ross and Travis, thank you very much. So, that concludes Nuclear Industry Council's comments on Subpart B.

MS. VALLIERE: Thank you. Thank you. Yeah, thank you to all the USNIC presenters. You've certainly given us a lot to think about and we appreciate your insights.

I guess I'll just pause for a minute here. Bill, do you have any high-level comments you want to make before we move on to the next presentation from NEI? And I note that NEI will touch on some of the same issues.

MR. RECKLEY: I guess I'll just -- the one that was maybe a recurring theme, at least mentioned in a couple of the areas, our intent, and I think we've been straightforward on this, has always been that NEI 18-04, licensing modernization, would be one way to meet the Part 53 requirements. And so I'll acknowledge we had that in mind as we were developing the language. We were not trying to require it, but having in mind that NEI 18-04 was one way to meet it definitely influenced how it was written.

So, your comments will give us some things to think about and maybe go back and look at the specific language if it got too specific.

On the other hand, and this is an issue that we've always had, that when we've worked with NEI or we've worked with owner's groups or any group of applicants to come up with guidance like, in this case, NEI 18-04, it's one acceptable way and we'll acknowledge it's only one acceptable way. If individual designers or if groups, if there's a technology or other consideration, would want to develop, let's say, an alternate approach to defense-in-depth than that presented in NEI 18-04, or alternate risk criteria to the QHOs, which is also included in NEI 18-04, then we would certainly -- we'd be able to work with and cooperate with any other entity or organization that wanted to maybe step up and develop alternative guidance to that.

So, I'll just leave it at that and we can get into the next presentation.

MS. VALLIERE: Okay. Thanks, Bill. And now we're going to turn the floor over to NEI to present their thoughts.

Marc, are you ready to present your slides on Subpart B?

MR. NICHOL: Yeah. This is Marc. Can you hear me?

MS. VALLIERE: Yes, we can. Go ahead.

MR. NICHOL: Okay. Excellent. Thank you. So, thank you for the opportunity to present on this topic. We actually benefitted greatly from your explanation in the last meeting. And, with that, we had put together what I think were some pretty well-though-out ideas and alternatives, you know, building on what you all had proposed in Subpart B and trying to improve upon that, while still being consistent, especially in the areas where we agreed with you. So this presentation will go into more depth and background on the letter we sent with those formal comments.

We can go to the next slide. And, I think, actually forward on to the next one.

So, I'm going to start talking about the safety criteria. This is the Subpart B. Your Subpart B had more than just the safety criteria, I'll address those other requirements as well, but I want to talk about the safety criteria. And you started out with safety objectives -- I'll skip safety functions -- safety objectives, and then two tiers of criteria.

And, from your explanation, we really got the understanding that there was a tier that was dedicated toward reasonable assurance of adequate protection, and then there was a tier dedicated toward

what we call extra-adequate protection. I know you called it minimized danger, which is the term used in the Atomic Energy Act. I'm told by my lawyers that extra-adequate protection is actually the preferred term of art in the legal world because it has a greater meaning to it.

So, we recognize -- or we understood that that's what you were trying to do. And so, within that, we agree and we believe that the primary focus really should be on a reasonable assurance of adequate protection since that's really the legal standard for licensing.

And, along the lines of some of the feedback you got in terms of clarifying what reasonable assurance of adequate protection means, we included that into all our alternative-proposed draft rule text, really basing a lot of it on the NRO 2018 memorandum that went toward clarifying some of that, and especially making sure that it's clear that it doesn't mean elimination of all risk. And that's very key there, back to the regulatory philosophy comment I had made earlier in the meeting.

But we also recognize that the NRC has full discretion to implement regulations for extra-adequate protection. That's the court case

that's referenced here that sort of clarifies that. But we also know that the NRC has clarified that the focus of this extra-adequate protection really needs to be on substantial safety benefits that are justified by economic costs. And so that's an important element to capture in the regulations, which wasn't there before. And so you'll see from our alternative proposed draft rule text that we also provide that context.

And so, within that, we also recognize the NRC's proposal for two tiers was a little bit complex, or maybe overly complex, and it was really difficult to figure out how those work. That was actually part of -- I think that is a root of part of my challenge with understanding Subpart C, is that's where you really start to see how it becomes complex to implement two tiers.

And so in our proposed change or alternative it's still separated. And so we propose a requirement for reasonable assurance of adequate protection, and we proposed another requirement for extra-adequate protection. The criteria under -- we believe this is largely consistent with what the NRC was proposing. Under the reasonable assurance of adequate protection requirement, the criteria of 25

rem for what we call infrequent events would be there. Infrequent events is the term for what would capture design basis accidents. And so part of my comment earlier today is we could structure the requirements without defining classifications, and that would be the way to do it, term it as an infrequent event rather than a design basis accident.

And then the other requirement for extra-adequate protection, this is where you get your normal operating conditions, including, you know, if somebody had an AOO, that would be a normal operating condition.

And then you have another criteria for rare events. And this would be, presumably, design basis events, but, again, not having to use that term. And so for those very rare events.

And so we think by setting it up that way that, once we start to develop these other safety construct requirements, it will be much cleaner to tie them to these two requirements and be able to specify what additional requirements apply to things that are being provided to meet adequate protection versus what's needed to meet extra-adequate protection.

So, we do think that it's consistent. You know, and we tried to simplify the language as well.

I'll get into a little bit of clarity of language later within that.

There was a difference, one major difference -- and if you can go to the next slide now -- one major difference between what the alternative group proposed and what you had. And it really gets into the area of ALARA. And, you know, I didn't mention it specifically; there was the effluent dose releases that you had in there, as well. So, I sort of consider that as a type of ALARA, a more prescriptive ALARA requirement. And we didn't see that the ALARA really is needed for Part 53 requirements.

Now, there is a cost for regulatory compliance. We don't really think there's a substantial safety benefit. Part of my comment earlier today is regulating to safe and not trying to regulate ever-increasing levels of safety. Safe is safe. So let's be safe. But, beyond that, let that be to the discretion of the licensee.

And we do plan to implement ALARA practices. They make sense. They're wise practices. And, you know, even the Commission had noted a while back that the concept is intended to be an operating principle, not an absolute. And so I really take that

to mean that, hey, it's a guiding principle. If you can do it, you know, implement it the way it makes sense to you. I don't really think that it's something the NRC has to require.

For either of those, you know, it's certainly not adequate protection, and I don't think it's really necessary for extra-adequate protection because you've already got the criteria for normal operating conditions, 100 millirem to the public, or, for the rare events, which the NRC proposed QHOs. We'll talk about alternatives for that a little bit later here.

So that really would be the argument about why ALARA is not really needed. It's not that it's not a good idea. It's not that industry won't implement it at the plant. It's just a matter of not really needing to fall within the NRC's regulatory footprint.

We do know that this would be a difference and a change. We don't think that there would be any negative impact to safety. As I mentioned, safety is focused on those safety criteria, not how you can cost-justify it going down to lower levels of safety.

And we did mention in our letter that if, you know, the NRC wanted some greater assurance that

industry actually is going to look at doing ALARA programs, that you could issue a policy statement encouraging industry to do ALARA, similar to the advanced reactor policy statement, which encouraged industry to develop advanced reactor designs that have improved safety levels. And we follow that. We believe in that policy statement. And I think you see the advanced reactor designs that are coming about do have increased levels of safety.

So, next slide, please. Now I'll talk about the quantitative health objectives. And we've talked for more than two months with our members about this. It's been a topic of great conversation and great insight. I would say that there are people that do like quantitative health objectives in the rules, and there are people that don't like the QHOs in the rules.

NEI has not yet taken a position on it as an industry position. We do plan to do so at the right time, but we think that, more than that, it deserves some more detailed discussion. It's not a light topic to just pop the QHOs into the requirements and move forward. We think that needs to be really well-thought-out and it really needs to be a deliberate decision.

The reason is: this would be the first time the QHOs are in the rules. And the Commission always intended the QHOs to be as a policy statement, not in the rules. So this would be something to really do with a lot of forethought.

I do want to make sure that we all understand that whether the QHO is in a policy statement or whether it's in the rules, the level of safety of the plant is the same. The design, the analysis, the NRC scope of review, they are the same. The QHOs will have to be met regardless of being a policy statement or a regulation.

So, that's not the consideration. The difference is in legal compliance with the requirements. And so, if the QHOs are in the policy statement, there's no legal compliance because, you know, there's no requirement to legally comply with. And so, if it is in the rules, then there is.

So, let's go to the next slide. There are two options here that we've discussed and come up with. One is the QHOs in the rule language. And if it were in the rule language, we would propose framing it differently. We think that this framing is more precise, accurate, and leads to less confusion, but is otherwise largely the same as what the NRC proposed.

And the other is, if the QHO is in the policy statement, the question is, well, what is the criteria for -- under extra-adequate protection, what is the criteria for these rare events, or what we typically call beyond design basis events? Well, we think that the alternative there could be similar to what's done under Part 50/52 and equivalent to 50.155, which is the mitigation of beyond design basis events. And if we did that, then we could write more technology-inclusive performance-based language for Part 53. This is the language that we had come up with.

So, that's how we see it. And I really would like to understand from the NRC -- so this is a question I hope you will respond to in this meeting, because it came up in Subpart C where it appeared that even if the -- you know, the NRC is requiring mitigation of beyond design basis events even if the QHOs are in the rule. So, we see it as an either/or. I don't know if the NRC sees it as, regardless of where the QHOs are, you're still going to have a requirement for mitigation, or if you also see it as an either/or. So, hopefully at the end of my presentation you might be able to shed some light on that.

Next slide, please. This is looking at the advantages of the QHOs in the rule versus the disadvantages. This doesn't look at the opposite, which is what are advantages of QHO in the policy statement. It's not exactly an inverse of that, but it's close enough.

So, I will talk through this a little bit. And on the advantages side, we do recognize that there is enhancements to the regulatory stability, because if the QHOs are in the regulations, then it's harder for these limits to change or for arbitrary judgments to be made on the QHO. So there is some regulatory stability.

Likewise, there's some additional clarity that's provided by having specific limits of acceptable risk to the public for these beyond design basis events, specifically, you know, in the risk areas that are presented in there.

Having the QHOs in the rule ensures that the regulations are explicitly -- that the regulations explicitly result in the risk levels that comply with the QHOs. And the QHOs -- I'm going to combine a couple -- the QHOs are also the maximum acceptable consequences, and, therefore, avoid more conservative surrogate requirements. And so there is a lot of

benefit in that in terms of not being overly conservative in that area.

And the QHOs are understandable to the public because they're expressed in terms of public health effects. That's latent cancers and immediate health effects. And we believe that if the QHOs are in the rule, then they could eliminate the need for mitigation on beyond design basis events.

Now, on the disadvantages side, including that QHOs can increase regulatory uncertainty because it would establish the requirements without specifying the consequence limits. So, if you look at the other criteria, 25 rem for adequate protection, 100 millirem for normal operations, this would not specify the consequence limits.

So the question is: what are the doses for immediate fatalities and latent cancers that would be acceptable? The answer is: it's fairly complex. And, you know, to the best of my understanding, the only place it's documented currently is in computer codes, analytical codes, like MACCS.

Now, that doesn't mean that it couldn't be specified in guidance. And certainly, if QHOs were in the rules, then we would push for these consequence limits being in guidance. But not having them in the

rule, they could be subject to change. That reduces some regulatory stability if they were.

The other thing, I did mention earlier that the Commission's intent was not to have the QHOs as limits, but rather as goals. So including them in the regulations would make them limits.

And then there is increasing licensing risks. The complexity of demonstrating QHOs are met are high. Now, that complexity is not eliminated by keeping them in a policy statement, but the complexity or the difficulty in demonstrating it in the legal compliance space increases. There's also some subjectivity to changes and some societal risks that could force changes to the facility design if they're in the rules. I think there's less flexibility in that area. And I mentioned how these analyses would be used for legal compliance.

The last one here is an unknown. We looked at the history of the QHOs. The NRC discontinued its efforts, back in 2000, to update the safety goals. And it was really the staff was pursuing it, the Commission said don't do it, let's get more insights from risk decision-making and then do it. So the question would be, if we're putting QHOs in the rules, would it necessitate a need to

update the QHOs at that time? So, that would be a key uncertainty.

And the purpose of putting these advantages and disadvantages up here is to create discussion. As I said, we haven't taken a position on it. We'd invite the NRC's reflection on these advantages and disadvantages. And it's not to say that, you know, putting it in the rule is all for the best or putting it in the rule is all for the worst. There's arguments on both sides. And so I just want to make sure we collectively make our decisions with full information.

Next slide, please. Somewhat related to the QHOs is this topic of quantitative frequencies. Even in the 25 rem, the NRC had put in there frequencies greater than once in 10,000 years. And, again, some people like to have quantitative frequencies in the rules. Others prefer to have the quantitative frequencies in guidance and then use qualitative frequencies in the rule.

So I did want to, again, stimulate conversation and make sure we're making a well-informed decision. And, again, whether the quantitative frequencies are in the rule or whether they're in guidance, the level of safety is the same.

The applicant's design, analysis, and scope of review are the same. It's just a matter of what are the additional benefits or disadvantages of putting them in the rule.

And so, here, the third sub-bullet under the first bullet is really a comparison of what it would look with qualitative versus quantitative frequencies. The first italicized brackets is the qualitative frequencies. So, here, where we're talking about infrequent events, this is for adequate protection of 25 rem. And frequent events would be ones that are not expected to occur in the lifetime of a nuclear power plant. That's a qualitative. And then in guidance we would say not have expected frequency greater than once in 10,000 years. Or, if the quantitative were in the rule, you would say that infrequent events are those that have expected frequencies greater than once in 10,000 years.

The other thing I'll point out, just in terms of what we think is better clarity of rule text, we eliminated some extraneous words. And so it does read slightly different than the NRC's, but from a technical perspective it comes to the same conclusion.

Again, including quantitative frequencies in the rule would be a first of the kind, and

certainly there would be more stability from that because the values are more difficult to change in the future. But we do need to consider potential for unforeseen complications. There's been expressed a concern that the role of the PRA in demonstrating legal compliance would increase.

I think we see that reflected in Subpart C where you have many more prescriptive requirements on PRA and what we would do. And I note that, you know, Peter Hastings had made a cautionary comment about that. And then also what happens is the state of the art of the PRA continues to change over time.

Next slide, please. I mentioned the related requirements. And in our letter we did not propose alternatives for those because I think they fit better with what's been put into Subpart C, you know, the design features and those sorts of things.

The licensing basis events, the defense-in-depth, the safety functions, those all sort of fit together in what we're calling the safety construct.

And so we wanted to focus now on just the safety criteria, and we intend to come back and address those safety functions, LBEs, defense-in-depth, when we make comments on Subpart C. So I want

to make sure you're aware of that.

Similar to USNIC, we think that for occupational exposure the NRC proposal wouldn't be consistent with Part 50/52. It really -- and similar to NRC's proposal for ALARA -- moves it from a radiation protection program into design constraints. And that would be new and we don't think it is really justified. So we would propose to address occupational exposure similar to Part 20. You know, our proposal that would not have requirements in Part 53 for ALARA would need to figure out how to address those Part 20 requirements that are related to ALARA that would not apply to Part 53. But that could easily be done.

Administrative requirements. There will be a whole bunch of these that I think we'll need to put together as we go forward. One is the NRC's authority for new requirements. That was in one of your criteria. I think the comments back at the last meeting, we took it to mean that, oh my gosh, every application you're going to come up with new requirements here. Your comment was, no, this is really the NRC's authority to do that. And we agreed. And we do also acknowledge it has some limitations, like a backfitting. So, those could be rolled up

together somewhere in an administrative subpart.

I touched mostly on some specific areas for performance-based language. And, really, when we write these, we want to avoid unnecessary language. So, wherever we don't need a word, don't include the word; wherever a word or term or phrase is ambiguous, don't use it in that way. Make sure it's clear and precise. That will avoid complications.

So, some of the terms that were used, "high confidence," "upper bound," I think those were mainly used for quantitative frequencies. And, you know, we may have some technical comments about whether those are the right things or not, but they're better included in guidance rather than rule language. And I think you'll see our alternatives to quantitative requirements show how you could eliminate them.

And then there were a lot of repeating of similar information which every time it's in there -- and I'll just pick on the term "design features and programs will be included to demonstrate" -- or every time you include the same thing over and over and over again, that's a new requirement that has to be demonstrated. And especially if it's phrased differently, then that's going to come up with all

kinds of complications.

So, the idea here would be simple, not repetitive, in that regard. That was part of the thinking we tried to put into our alternative proposed draft language, which we think it accomplishes the exact same thing you did in your safety criteria. And so we look forward to your feedback on that.

Next slide. I'll go through quickly here. I know the meeting is coming close to an end. Also in our letter we proposed success criteria, or you could also call them project requirements. And this is success criteria for what does a successful Part 53 look like?

And this follows up from our October letter with a systematic approach where you start by defining the -- having the end in mind and defining what the end product needs to look like. In this case, it's the final Part 53 rule. And then you can work toward those requirements. And it gives a lot of benefits.

One is you can make sure that you're working towards success the entire time, because you already know what it looks like. You could use that to plan discussions for these meetings with stakeholders and also guide the development.

What the success criteria did not do is define, you know, how to do it or the process to do it. That's really not the intent. And so you'll see things within our success criteria like, you know, defining the safety construct or the safety criteria, things we're talking about now, but also things like defining the types of licenses to be approved, what is the application process. We also identified in there operations, construction, that sort of thing.

So, having that all laid out together I think actually helps facilitate what was discussed earlier today, which is alignment on the grand vision of Part 53 and how everything fits together. That's one of the benefits of the success criteria, is it shows how everything is fitting together. So we encourage NRC feedback on that.

And when we developed these project requirements, we aligned them with both the NEIMA and the vision and goals that we proposed in our October letter. So we think that there's great alignment there. And while we intended to be exhaustive, we do expect additional criteria to be identified, just as further clarification of the scope or as we start to realize we forgot things.

Next slide. This is just a listing of

some of the higher level ones. I mentioned a couple of these. But, even in terms of defining, well, what are the licenses, you know, starting to talk about how is this going to fit back with 50 and 52 is going to help, because if the NRC has a vision of how 53 fits with 50 and 52 and it's different than what stakeholders are thinking in 50, 52, and 53 working together, then that's going to lead to a lot of differences in perspectives on how the details within each of these requirements work.

And I'll just take the Part 20 as an example. That's probably the first one that came up. You know, is the intent to have radiation protection all in Part 53? Is it to reference completely to Part 20? Is it to, you know, somehow recognize that not all of Part 20, specifically ALARA requirements, don't need to apply, and that's what needs to be worked out? Or even there was an earlier discussion about security. How is security going to fit in?

I think that we really should discuss an integrated approach to safety and security. Whether at the end of the day that makes sense to put into Part 53 or not needs to really come out of a discussion. I think that there's a lot of potential benefit to doing that, but, anyway, that's what this

type of document can drive.

Next slide, please. We need some feedback on some ACRS recommendations. The first is addressing uncertainties. We didn't really agree with their assessment on this. We think, first, we did agree that a systematic approach needs to be done to address uncertainties. We really think that this can be done with modern tools. Specifically, NEI 18-04, we think, does this. And so we disagreed with their presumption that you have to use deterministic postulated worst case approaches for all designs.

We think a better approach would be to focus on these more risk-informed things that's being developed, but also allow flexibility for deterministic if that's the approach that works best, but that not be, you know, the primary focus. Similar prototype licensing should be an option, but it shouldn't be required.

And then the GDC, the ACRS seem to imply that the GDC from Part 50 should be included in Part 53. Maybe a technology-inclusive adopted -- or adapted, I should say. We really -- based on our experience with the ARDC and trying to be technology-inclusive, it seems really difficult to come up with a set of design criteria for Part 53 that

would be applicable to all designs.

So, while we think design criteria need to be addressed in Part 53, we don't think a set of it that applies to all reactors is the best way to do it. So we're looking at proposing an alternative approach when we make comments to Subpart C and the other requirements from Subpart B that we didn't comment on yet.

I think that's all I had, if there's any questions or feedback.

MS. VALLIERE: Thank you, Marc. We appreciate NEI's comments on Subpart B and the other topics you covered.

Bill, do you have any comments you'd like to make before we move on to our final stakeholder presentation?

MR. RECKLEY: No, not specifically. Was there something, Marc, that you were looking specifically for feedback from us?

MR. NICHOL: Yeah. There was one specific question, if you're able to answer it now. And that is: you proposed the QHOs in the requirements, and then today we saw there was a potential requirement for mitigation of beyond design basis events. We would see that if QHOs are in the rule, then there's

no need for a mitigation of beyond design basis event requirement. That it's one or the other.

And I was wondering if you saw it as one or the other, or if you see it as, regardless of where QHOs go, you are also going to need a mitigation of beyond design basis event requirement.

MR. RECKLEY: Yeah. I mean, we were trying to capture things to make sure we didn't lose anything, and where that showed up is if not covered in the PRA. So, my own personal thought is that, for example, if you were using NEI 18-04, you would probably disposition that as being covered. It would require a little bit of additional guidance, because keep in mind that 51.55 is not for beyond design basis events. It's for a specific beyond design basis event that's actually defined within the rule. But we did want to make sure we didn't lose that thought, and gave it some further consideration.

So, I know we had -- even as we were writing it, we knew there were more work to be done in that area, but -- so I generally agree with you that, as we matured this, if you followed a probabilistic approach and had a metric like QHOs, that you could probably not need to do anything in addition to satisfy the mitigation part of 51.55.

We also have to look at the loss of large area part of 51.55, and that's going to be an area of additional discussion. So, we know this is a work in progress. And, you know, I'll be honest, we haven't thought all of this all the way through.

MR. NICHOL: Yeah. And you'll see that -- and they're on the slide now at 60 there. So, if you look at the bottom bullet, that also addresses loss of large area. So, we try to take that entire thing and say, well, you know, adequate protection comes from assuring that the -- and I'll just use the design basis accident even though that's not the terms we're using -- design basis accident, so less than 25 rem. But there are accidents with, you know, that are beyond that, and we need to have a cutoff for that as well, that are beyond that that we need to have a little bit of extra-adequate protection.

And so we said, well, if we didn't use QHO, then how would you do that extra-adequate protection for these beyond design basis events? And the conclusion was, well, you could mitigate them, because the mitigation is a very good approach. And you can see here that the types of mitigation you need to be able to -- the capability to maintain or restore the fundamental safety functions, you know, access and

use of offsite. And that could apply to anything that's a beyond design basis event.

So, anyway, we --

MR. RECKLEY: No, this is very useful and it gives us some things to think about. Again, you know, you have to be careful as you're bringing things -- and you cautioned us, and then I'll return the caution of bringing things over back and forth between 50, especially Part 50, and what we're proposing here.

You know, 51.55 was added to a set of plants that had pretty much well-defined requirements already, including compliance with station blackout rule and things like that. And so we added this in that context.

If we went to your proposed language, you know, we would end up still having to discuss, in my opinion, having to discuss a probabilistic element to this, which is: would your wording, the proposed wording on the slide, simply require one success path? And is it clear that one success path is always okay?

For 51.55, we were able to evaluate that in the context of it was being added onto a set of requirements in terms of the existing accident analysis, as well as things like the emergency procedures and the requirements that were added for

the 9/11 orders and all of that. So, it was added on in that context.

And so, as we look to come back, it may very well be a proposal, but there would still be then questions we'd have to answer that, in my own opinion, are resolved, actually, by referring to the QHOs.

So, anyway, we'll look at your wording, and it's a good point of discussion.

MR. NICHOL: Yeah. And just to provide clarity as you think through it -- and we'll just take station blackout as one. So, let's say a plant identifies a station blackout as a beyond design basis event. So it would fall under this requirement. Well, the requirement would be to maintain or restore the fundamental safety function. So, let's just say that plant's fundamental safety function is core cooling.

Well, if it can provide core cooling without electric power, then a station blackout is not really an issue. So, boom, that whole issue goes away for them. Or, if it is an issue for them, well, they may need to have some ability to address the station blackout.

So I think it does give that flexibility to think through it without adding in a lot of

complexity and prescription. So I think it's fairly flexible from a technology-inclusive approach, but --

MR. RECKLEY: Okay. It may be. We'll look at it. Thank you.

I guess it is approaching 4:30. So, Nan or Bob, if we want to go on to --

MS. VALLIERE: Yeah. So, I think next we're going to turn the floor over to Michael Keller from Hybrid Power Technologies.

Michael, are you on the line and prepared to present your slides on Subpart B?

(Pause.)

MS. VALLIERE: So, perhaps Michael was not able to join us today. So, Michael's slides are in -- go ahead, Bob. Were you going to say something?

MR. BEALL: Yes. Mike, can you unmute your phone if you're on the line? Or put something in the chat window if you are.

(Pause.)

MS. VALLIERE: So, Bob, it appears, as I was saying, that he was not able to join us today.

MR. BEALL: Yes.

MS. VALLIERE: So, perhaps we can just alert the other attendees to the fact that his slides are included in the slide package that you referenced

early in today's meeting. And that can be found in the public meeting page on the NRC's public website.

And so I guess at this point I'll ask -- we have had some raised. Is that correct?

MR. BEALL: Yes, we have two.

MS. VALLIERE: Yes. Mr. Kee first?

MR. BEALL: Yes, ma'am. So, Ernest, if you could unmute your phone?

DR. KEE: Hi. I promise to leave after this comment, but I did go back and look at the AEA as amended, and I think Congress has it right that reasonable assurance with adequate protection is called out in two places there with regard to temporary or interim use. And that's Section 189 and 192.

But Section 189 and 192 -- and Section 182, which is, I think, what we're up against here -- it, in my opinion, purposely leaves off the reasonable assurance. So I'll just leave it at that.

And with regard to the discussion around probabilistic risk assessments and, most recently, quantitative health objectives, I want to warn y'all that we don't have the law of large -- this isn't like automobile accidents where you can find frequencies of different kinds of consequences. We don't have that

here. And so it's very valuable in probabilistic risk assessment to look at the scenarios, like I think people have said earlier, what will take you to a problem?

But when you go to assigned probabilities, this becomes kind of, I think, a bridge too far, especially -- I mean, we don't have enough data even in the existing reactor fleet. One hundred reactors, we don't have the law of large numbers even close on our side, especially domestically.

Now, if we now go to advanced reactors where nothing exists, they haven't even been built yet, then I just think this indicates caution on trying to assign probabilities, and I would go back to saying let's be careful with that. That's all I have to say.

MR. RECKLEY: Okay. Thank you. I'll use this as an opportunity to plug an effort the NRC didn't do, this was a DOE initiative working with EPRI and Vanderbilt and some others, to look at basically going to -- from process hazard analysis, or other tools, and using those assessments that are not as focused on the probabilities to then inform and build the PRA.

The other aspect is I think we will all

have to be comfortable with large uncertainties as PRAs are used.

And that might be a little different than what we were accustomed to, but that actually can be a good thing to use the PRA, acknowledge that there's large uncertainties in -- but continue to use it as a tool.

But anyway, I'll leave it there. We have more hands raised. So, Nan or Bob?

MR. BEALL: Yeah. I think the next one is Ed Lyman. So, you can unmute, please.

MR. LYMAN: Hi. Can you hear me?

MR. BEALL: Yes, sir.

MR. LYMAN: Hi. Thanks. A few comments. So, I had to laugh when the NIC presentation suggested that you define "adequate protection" in the context of this rule. And just looking at the schedule you have, the idea that you can actually do that and resolve an issue, which I think has been discussed for -- since the Atomic Energy Act was originally passed, that you can do that by the end of this year is -- I assume you understand how absurd that is.

Not that I wouldn't be opposed to you coming up with a clear definition of "adequate protection," but I think the Commission's weighed in

periodically that that isn't necessary.

On the QHOs, we certainly don't support the use of the current numerical values for the QHOs in any kind of new rule.

As you know, the QHOs do not even -- they are -- greatly exceed the risk profile for the current fleet looking at SECY -- let us see, 97-208, where the staff pointed out that a core damage frequency of ten to the minus 4th per year is more stringent than the QHOs.

So, given the CDF of the fleet average is less than that, that means the QHOs are much less protective than even the current fleet. So, including them in a rule for advanced reactors, which arguably, you know, are not supposed to be safer than the current fleet, but certainly not less safe, so I think without revising them and updating them they should not be included.

And certainly without an additional societal risk QHO that would address the issue of land contamination and non-individual risk end points.

The other aspect of the QHOs and trying to -- because they're explicitly in terms of cancer risk and (audio interference) cancer risk, the linkage of those to actual fatality risk is not a uniform linkage

across the population.

In fact, as the NRC or in all other federal agencies are going to have to grapple with the issue of racial equity and discrimination in their regulatory processes, I think you're going to have to take a hard look at whether using these uniform risk metrics that don't take into account the pathway between being exposed to a carcinogen, you're actually dying of cancer, which is rooted in discrimination and racial inequity in access to healthcare and all those other factors. You're going to have to grapple with that. We're going to make sure that you grapple with that.

My final point -- well, actually I had a question and it was to Mr. Nichol. He compared two numbers which I think are not direct comparisons and I just want to make sure I understood that.

So, could the NRC clarify when he put events -- this is slide 59 of the slide deck. He compared events between 1 in 10,000 years and 5 in 10 million years where the first was the reference to the -- sounds like a reference to core damage frequency, but the second is the QHO. And that isn't core damage frequency. That's individual latent fatality risk.

So, can someone clarify if that's what's

going on there? Thank you.

MR. RECKLEY: I think, and since it's not my slide, but I think the 1 in 10,000 to 5 in 10 million are relating to basically back to the licensing modernization. That is the band that we refer to in Reg Guide 1.233 and referencing NEI 18-04 as the beyond design basis event category.

And so, as we were developing this language in Part 53, we used the 1 in 10,000 --

MR. LYMAN: But those are apples to oranges. Isn't 5 in 10 million, isn't that the QHO --

(Simultaneous speaking.)

MR. RECKLEY: It actually does and it's where the numbers correspond. It's also in -- and I don't know. Maybe I can ask Marc to come in since I'm trying to interpret his slide.

MR. NICHOL: Am I still through or do I need to unmute?

MR. BEALL: No, Marc, you're still good.

MR. NICHOL: Okay. Yeah. No, that was shorthand. So, the events to a frequency of 1 in 10,000 years is the adequate protection. That's design basis events. And then events up to 5 in 10 million years, that's the cutoff for beyond design basis events. So, that was just to reflect that.

Those numbers aren't being compared there. So, it's just basically saying beyond design basis events are those that have a frequency between 1 in 10,000 years and 5 in 10 million years. And that's consistent with LMP, NEI 18-04 and NRC-established policy.

MR. LYMAN: So, let me ask what's the physical origin for 5 in 10 million year core damage frequency?

MR. NICHOL: That's not a core damage frequency. That's --

MR. LYMAN: Then it's apples to oranges. Those aren't the same units.

MR. NICHOL: Well, the 1 in 10 million years is also events. They're both events. We don't use core damage frequency for advanced reactors.

MR. LYMAN: No, the -- well, actually we do, but it -- by saying 1 in 10,000 years in the rule refers to a frequency of initiating event, right?

MR. RECKLEY: No, an event sequence. So, it's not just the initiating event.

MR. LYMAN: Okay. The sequence. That's the -- an event sequence. 5 in 10 million is what the QHO -- that is likely in cancer fatality risk.

MR. RECKLEY: And that's -- well, it's not

a coincidence, but sort of a coincidence. It's also within licensing modernization. The bottom frequency --

MR. LYMAN: Okay. But what --

(Simultaneous speaking.)

MR. LYMAN: All right, but I wasn't aware of that, but what is the technical rationale for that? That's kind of odd.

MR. NICHOL: I'm not the expert on the LMP approach. So, I can't answer.

MR. LYMAN: Possible the LMP screwed up. I have to go back and look at it now.

MR. RECKLEY: Well, yeah. Well, and look at the Reg Guide. I mean, we did give a fair amount of consideration to how far down in the frequency ranges you needed to look at events.

The proposal in NEI 18-04 was -- it was the 5 in 10 million years. We thought that was a reasonable number with the caveat, as we pointed out in the regulatory guide, that it's not an absolute floor.

That the PRA is going to be looking at sequences at lower frequencies and you do need to go down to lower frequencies to look for things like cliff edge effects and other factors and uncertainty

to make sure there's no uncertainties that are going to push the 5th or 95th percentile above that frequency range.

MR. SEGALA: And, Bill, they also do cumulative risk measure looking at all the event sequences to compare against the QHOs in LMP as well.

MR. RECKLEY: Right.

MS. VALLIERE: Okay. I don't think we have any other hands raised, do we, Bob?

MR. BEALL: No. I don't see anything else.

Is there anybody on the bridge line that would like to ask a question or make a comment? If you do, please put something in the chat window or unmute your phone with *6, please. Say something.

(Pause.)

MR. BEALL: Okay. Let's go to the next slide. I think USNIC would like to make some closing remarks.

Cyril?

MR. DRAFFIN: Thanks. This is Cyril Draffin for the US Nuclear Industry Council. Go to the next slide.

We certainly appreciate the opportunity to have a dialog with the NRC staff regarding a

streamlined Part 53 that meets the adequate protection standard. It might be a challenge, but we think the group is up to it and we can provide more comments on the proposed Subparts C and F in the next couple weeks.

And as Jeff Merrifield mentioned, we suggest a more interactive workshop on Part 53 to enable -- facilitate more dialog, raise some of the issues that we've raised, and NEI has raised today, and kind of go through some more of the details than just long presentations and some response.

Bill had indicated that there might be an all-day meeting. I know you had indicated earlier on it might be in early February and we're happy to work with the NRC to make that as constructive as possible.

On the last slide, we had just a reminder that advanced reactors can be used for more than just power generation and so we need to think through nonpower applications as well.

And that every element of the licensing process needs to be considered, and that includes technical, administrative and procedural lines and the Advisory Committee on Reactor Safeguards, how they interact with applicants, questions they ask, how they overload in terms of duration of comments.

So, it's not just what they recommend, but also how much time it takes to work with them, what their role is, as well as the Atomic Safety and Licensing Board.

And then, finally, internationally we refer to the Danishes for having some approaches that could be applied in multiple countries and some regulatory standards for quality assurance and others so that Part 53 moves the entire world forward in terms of licensing advanced reactors.

So, I'll return it to NRC for final schedules.

MR. BEALL: Okay. Thank you, Cyril.

Are there any last questions or comments? Please raise your hand using the Teams button.

(Pause.)

MR. BEALL: Okay. Well, on this slide it provides an overview of the current Part 53 rulemaking schedule. As you can see from this slide, we are still on the first milestone where the staff is performing public outreach, meeting with ACRS and working on the draft final proposed rule package.

The staff has 16 months to complete these activities before the draft proposed -- excuse me -- the draft proposed Part 53 rule package is submitted

to the Commission for review and approval. The staff is still projecting that the Part 53 proposed rule be published for public comment in October 2022.

Next slide, please. Slide 81. The staff will be hosting additional public meetings every four to six weeks. These public meetings will cover additional topics and will include the release of additional Part 53 preliminary proposed rule language.

The staff will continue to post all preliminary proposed rule language and any comment submittals received on the preliminary proposed rule language on regulations.gov under docket ID NRC-2019-0062 prior to the public meeting.

The next Part 53 public meeting is tentatively scheduled for early February 2021. And, as Bill has mentioned, we're looking at making that a full-day meeting.

The staff would also like to remind everyone of the importance of receiving both functional and technical feedback from stakeholders on the preliminary proposed rule language. In the upcoming months, stakeholders may need to determine if they have the right level of support to review the technical areas related to advanced nuclear reactors.

Future releases of the Part 53 preliminary

proposed rule language will be more technical than previous releases. And, as such, may require technical experts to address and provide feedback.

Slide 82, please. The NRC staff will also be hosting a meeting with the NRC Future Plant Subcommittee to receive feedback on the Part 53 rulemaking. The first meeting will be on January 14th, 2021, to discuss Subparts B and F. Additional ACRS meetings will be held every one to two months.

In addition, separate from the current Part 53 public meetings, the NRC staff will have a series of public meetings to discuss and receive feedback on the regulatory framework for fusion energy systems. The first of these public meetings will be on January 26th, 2021.

Slide 83, please. In addition to have -- 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 addresses on this slide. Your interest and comments will provide -- will improve our rulemaking effort.

I also encourage you to monitor the Part 53 rulemaking docket ID -- again, that's NRC-2019-0062 -- on the regulations.gov website for updates and 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 webpage, click on the "Recently Held Meeting" button and look for this meeting. The meeting feedback form will be at the bottom of the meeting announcement.

I'd like to thank everyone for participating in today's meeting and I hope everyone has a good evening. Thank you very much for your attendance. This will close the meeting for the day.

(Whereupon, the above-entitled matter went off the record at 4:45 p.m.)