

UNITED STATES
NUCLEAR REGULATORY COMMISSION

+ + + + +

UPDATE ON 10 CFR PART 53 LICENSING AND REGULATION OF
ADVANCED NUCLEAR REACTORS (PUBLIC MEETING)

+ + + + +

THURSDAY,
JULY 21, 2022

+ + + + +

The Commission met in the Commissioners' Conference Room, First Floor, One White Flint North, Rockville, Maryland, at 9:00 a.m., Christopher T. Hanson, Chairman, presiding.

COMMISSION MEMBERS:

CHRISTOPHER T. HANSON, Chairman

JEFF BARAN, Commissioner

DAVID A. WRIGHT, Commissioner

ALSO PRESENT:

BROOKE P. CLARK, Secretary of the Commission

MARIAN ZOBLER, General Counsel

NRC STAFF:

DARRELL ROBERTS, Deputy Executive Director for
Reactor and Preparedness Programs

ROBERT TAYLOR, Deputy Director, Office of Nuclear
Reactor Regulation (NRR)

MOHAMED SHAMS, Director, Division of Advanced
Reactors and Non-Power Production and Utilization Facilities, NRR

STEVEN LYNCH, Senior Project Manager, Division of Advanced Reactors
and Non-Power Production and Utilization Facilities, NRR

LAUREN NIST, Branch Chief, Operator Licensing and
Human Factors Branch, Division of Reactor Oversight, NRR

TONY BOWERS, Branch Chief, Reactor Security Branch,
Division of Physical and Cyber Security Policy, Office of Nuclear
Security and Incident Response

ALSO PRESENT:

GREG CULLEN, Vice President for Energy Services and
Development, Energy Northwest

PETER HASTINGS, Vice President, Regulatory Affairs &
Quality, Kairos Power

DENNIS HENNEKE, Consulting Engineer, Advanced Plants
Risk and Reliability, GE Hitachi Nuclear Energy

ED LYMAN, Director of Nuclear Power Safety, Union of
Concerned Scientists

JEFFREY SEMANCIK, Director, Radiation Division,
Connecticut Department of Energy and

Environmental Protection

MIKE (MUHANNAD) SHAQQO, Senior Vice President,
Advanced Reactor Programs, Westinghouse
Electric Company

DOUG TRUE, Senior Vice President and Chief Nuclear
Officer of Generation and Suppliers Division,
Nuclear Energy Institute (NEI)

P R O C E E D I N G S

9:00 a.m.

1
2
3 CHAIRMAN HANSON: Good morning, everyone. I
4 convene the Commission's public meeting on 10 CFR Part 53, Licensing and
5 Regulation of Advanced Reactors. NRC is working to transform the
6 regulatory framework for advanced reactors into a risk-informed,
7 performance-based, and technology-inclusive approach.

8 Central to this effort is the development of 10 CFR Part 53.
9 Today, the Commission has an opportunity to hear external stakeholders'
10 views on the development of Part 53 and also get an update from the staff.
11 NRC is taking a novel approach with this rulemaking, involving our
12 stakeholders by releasing preliminary rule language and conducting public
13 outreach and dialogue.

14 This approach is leading to a wide range of comments and
15 sometimes competing views. But I'm hopeful that consideration of diverse
16 perspectives early in the rulemaking process will ultimately produce a better
17 rule. I look forward to engaging in a fruitful dialogue this morning and
18 receiving specific feedback on the rulemaking effort.

19 We'll hear first from our external panel. Following that, we'll
20 have a short break. And then we'll hear from the NRC staff. But before we
21 start, I will ask if my colleagues have any remarks they'd like to make.

22 Okay. With that, we'll begin with our external panel. Each
23 panelist has eight minutes, give or take. I'm not going to hold any -- there's
24 no trap door beneath your chair. So don't worry about that.

25 We'll proceed in order in which you all are listed in the public

1 notice for the meeting. And we'll begin with Mr. Doug True, Senior Vice
2 President and Chief Nuclear Officer of Generation and Suppliers for the
3 Nuclear Energy Institute. Doug, the floor is yours.

4 MR. TRUE: Thank you, Mr. Chairman and
5 Commissioners, for inviting me here today. I'm glad to be part of this
6 discussion because I think this is a really important topic that's in front of the
7 Commission.

8 I'm going to start with some context. I want to go to the next
9 slide and just set this up. The conversation today is Part 53. But as we look
10 at Part 53, I think it's important to understand the evolving landscape that we're
11 operating in. So let's go to the next slide, please.

12 When I was here back in February of 2020, BC, before
13 COVID times, we had a conversation about advanced reactors. And I spent
14 most of my time talking about decarbonization. I presented a slide similar to
15 this one. This one is the newest version, a little bit prettier, that talks about
16 what's going on with our utility members and their commitments to reduce
17 carbon emissions. And the role that nuclear could, should, and we believe
18 will play in that decarbonization effort.

19 I want to move on to some new news on this front and sort
20 of provide some more detail on this. Next slide. In February, we initiated a
21 survey of the Chief Nuclear Officers of the operating nuclear plants that are
22 members of NEI. And we asked them several questions about how nuclear
23 fits into their decarbonization vision. The first question related to a
24 subsequent license renewal. And what we found in that survey was that over
25 90 percent of generation -- not necessarily 90 percent of the units -- but 90

1 percent of generation today is expected to operate to at least 80 years.

2 The question was framed in terms of at least 80 years
3 because we all know that's not necessarily the end, but it's the end that we
4 have an opportunity for today. So that means the current fleet will be
5 operating through 2050 and beyond.

6 We also asked questions about new nuclear and how that
7 might fit in. And we put it in a couple of different contexts. But the primary
8 result we got back was that if they had a predictable nuclear product to fit in
9 to provide reliable firm dispatchable power, they'd need about 90 gigawatts --
10 a little over 90 gigawatts of new nuclear.

11 That 90 gigawatts, if you translate that into SMRs which
12 seem to be the conversation of the day right now, not ruling out that there'll be
13 large reactors in the future. That certainly could be the case. But that
14 translates to something like 300 new plants. It might be many more modules
15 than that, but 300 new plants.

16 That's a scale that I don't think any of us really had wrapped
17 our head around. What's important about this is two things. One, our
18 members of operating nuclear plants only represent about 42 percent of the
19 total generation in the United States. So it's probably a floor in terms of the
20 amount that utilities would want.

21 And in fact, we didn't include PacifiCorp, Grant County, and
22 UAMPS in the survey. We were specifically focused on the operating fleet
23 because we didn't want to cherry pick who answered the question. The
24 second thing is, that I think this is really compelling because the chief nuclear
25 officers work for utilities whose responsibility it is to provide reliable power to

1 customers. Their customers expect their power is going to be there. They
2 understand what it takes to run a reliable grid. And if they say they think they
3 need nuclear, could use nuclear as part of that, I think that's a much more
4 compelling case on some of the waxing eloquent about what we can do with
5 storage and renewables. Next slide, please.

6 So while that survey is one data point, we think it's a
7 compelling one. We've also looked at this at a number of other ways, done
8 some modeling. DOE has done some modeling. EPRI has done modeling.
9 Breakthrough Institute just completed a report.

10 But all of them end up triangulating you into the hundreds of
11 units. This is what we're probably talking about here. So with that in front of
12 us and the efficiency that's going to be needed to be able to move through that
13 many applications I think is an important backdrop to what we're talking about
14 here because if we get this right, we can really enable that. If we don't get it
15 right, we can certainly truncate that.

16 So let me go on to Part 53. First of all, I want to start by
17 recognizing the tremendous effort the NRC staff has gone through over the
18 last 18 months or so. Maybe it's 21 months working on Part 53. They've
19 really kind of gone above and beyond in their pursuit of keeping stakeholders
20 informed on the decisions they're making, sharing information and I think that
21 they deserve a lot of credit with that. With that said, the industry continues to
22 be concerned. And you'll hear about more of that today about the usability
23 and desirability of the path or maybe I should say paths that are in front of us
24 in the current Part 53.

25 There's been a lot of discussion about predictability and

1 flexibility. Frankly, I think that's a big of a red herring. I don't think it's a false
2 choice to have to say you have to pick between those. I think that we do
3 believe that the alternatives, the original core Part 53 as originally proposed
4 are important. But we think that the so-called Framework B that's just come
5 out doesn't really kind of scratch the itch yet and there's some work to do.
6 And frankly I think, I'll talk about this later, maybe that should be merged.
7 Maybe we don't need a second framework. Maybe we can do it all within the
8 Framework A.

9 What's important is that the users of this regulation are
10 seeing the additional burden that's embedded in Part 53. And you'll hear
11 about that in different forms from different industry presenters today that
12 makes it less desirable than a Part 50/52 pathway. So what we don't want to
13 do is end up putting all this heroic effort by the staff to put a regulation together
14 that ends up not being used. So I think to us the important thing is how do
15 we get to a used and useful rule. Next slide, please.

16 So in doing and reflecting on this presentation, I began to
17 think about where we are and where we're going. And I think the Commission
18 has some important decisions ahead. So most importantly, what's the best
19 course to get to that Part 53 that will be used?

20 Certainly, we can proceed with a draft proposed rule, collect
21 public comments. The NRC could consider making it a mandatory rule. I
22 think that would be a mistake. Or we could take time to do some more on
23 Framework A or Framework B.

24 But most importantly, we've got to overlay this need for
25 efficiency because we need something that can process a large number of

1 applications. We continue to think that a single framework might be an easier
2 and quicker way to an endpoint. So I think that should be considered.

3 And I think the other thing that we're concerned about is a
4 lot of these plants are going to be significantly safer. We need that burden to
5 proportional to that safety. If you have a truly safer plant, there should be
6 less burden on those plants.

7 And finally, we need to think about how this fits into the
8 global situation because this is a global challenge. Decarbonization is a
9 global challenge. And we need Part 50 to support that. And we continue to
10 have open issues that I'm sure we'll get to discuss in the Q&A. With that, I
11 think I'll end and turn it over to my colleagues to add their remarks.

12 CHAIRMAN HANSON: Thanks, Doug. Next we'll hear
13 from Dennis Henneke. He's the consulting engineer for the advanced plants
14 risk and reliability, GE Hitachi. Dennis?

15 MR. HENNEKE: Yes. Thank you, Mr. Chairman. I'm
16 Dennis Henneke, I support the Chief Engineer's office of GE Hitachi in the
17 area of risk assessment and safety analysis. And I'm also the American
18 Nuclear Society chair of the Joint Committee on Nuclear Risk Management
19 which is the U.S. standard group that develops all risk assessment standards
20 for ANS and ASME.

21 I support all our nuclear reactors. If we can go to the next
22 slide. In particularly right now, we're looking at two reactors. For these
23 reactors, GE is generally supportive of a risk informed, performance-based
24 approach in Part 53. We have been from the beginning.

25 We like to see that our second reactors that are licensed to

1 go under this. But I think you'll see in our comments that we think we're a
2 long ways away. Our two reactors GE Hitachi is supporting right now is the
3 TerraPower-led Natrium reactor, which is a sodium-cooled fast reactor. It is
4 currently using the licensing modernization process, LMP. And that would --
5 if it went under Part 53, would be categorized under Framework A. And then
6 we are also supporting the BWRX 300, which is being initially proposed to be
7 built in Canada at the Darlington site. It is using a PRA-forward risk-informed
8 IAEA approach which I'll talk a little bit about in my slides. And if it went under
9 Part 53, it would be under Framework B.

10 Framework A and Framework B are quite different, as you
11 heard from the comments, with Framework A being a performance-based
12 approach. I would definitely not call it risk-informed. It's performance based.
13 And Framework B being fairly deterministic which is an unfortunate ending
14 too. We just learned over the Framework B details at this point. I'm going
15 to focus on trying to look at a risk-informed approach, such as the X-300 to be
16 put more under Framework A at least, a single framework, and provide some
17 basis for that.

18 Currently neither reactor would likely use Part 53 if licensed
19 initially under Part 50, initially because of the schedule, because we trying to
20 put our initial license out for an operating license in 2026 region. But in
21 addition, there's extra burden in Part 53. And there is no benefit. There's no
22 reduction of burden currently under the proposed rulemaking that would make
23 any sense for us to transition at some point to Part 53. And that's part of the
24 issue that the industry has been raising for quite some time and I have a
25 proposal for how to improve that. So let's go to the next slide.

1 I want to make sure I got my recommendations in before I
2 went into too much details because I am analyst after all. So I could spend
3 hours on the details. First, is that a PRA-forward approach, a risk-informed
4 approach, such as we use for X-300, which uses a risk-informed IAEA
5 approach has the same basic attributes as we're using for LMP as in Natrium
6 reactor. And we should include a PRA-forward approach such as this under
7 Framework A. We should not limit Framework A to an LMP-only approach
8 because LMP is not accepted outside the U.S. And so for those reactors like
9 the X-300, we're trying to build in countries in Europe and Canada. We would
10 be pushing everything uphill to try to get that approach accepted.

11 So an IAEA approach which gets the same attributes which
12 you'll see should go under Framework A. Recently, there was a meeting of
13 the International Organization of Harmonization of Licensing which was
14 commissioned by the Director General of the IAEA. Many of the panelists
15 here, their organizations supported that. And if we were to support an IAEA
16 type approach under Framework A and look at the details, that would help in
17 the international effort on harmonization. So think about that as a positive
18 outcome of trying to move in that direction.

19 The second recommendation is Part 53 is not risk-informed.
20 It is performance-based on Framework A and deterministic on -- generally
21 deterministic on Framework B. And we need to make sure that Part 53 is
22 truly risk-informed. In this day and age, we should be smart enough to make
23 requirements that answer the basic question that I have listed here, that if a
24 reactor, such as a Natrium reactor, such as the X-300 reactor, were to design
25 a reactor such that it has very small contribution for whatever attribute you

1 want to fill out. Let's say fire protection, combustible gas control, operator
2 actions, we had no risk significant operator reactions and so on. Are the
3 requirements different for that reactor than for a reactor, let's say if you were
4 to re-license a current operating fleet, which has an acceptable risk but has a
5 much larger contribution. In our review of the rule right now is the answer is
6 no. There is no difference. There is no difference in the fire protection
7 requirements for a low risk and a high risk plan. We have the same burden
8 overall. And that's the type of burden that we are looking to reduce in revising
9 what's listed there in Part 53.

10 If you look at the staff's slides, there's a slide on AERI and it
11 has a bullet that says licensee requirements are commensurate with risks.
12 That's the goal of the licensee. And that is not the case right now as far as
13 we see it. Let's go to the next slide.

14 So as I mentioned, I have a lot of details I'm going to skip
15 through. This slide shows the safety basis for a safety analysis for an LMP
16 type of approach. Not going into the details because I'm limited to eight
17 minutes. But what it says is under an LMP approach, the initial basis for the
18 licensing-based events, the safety classification, and the defense-in-depth
19 adequacy start with the PRA and the LMP analysis that supports that. The
20 deterministic analysis is still required and the results of that must agree with
21 the determinants of safety analysis. If you go to the next slide, you'll see the
22 same sort of diagram with a IAEA -- risk-informed IAEA approach. Now what
23 we do in that approach is those licensing-based events, safety classification,
24 defense-in-depth adequacy start with a deterministic safety analysis. And the
25 PRA informs that. And in the end, again, we must agree the PRA and the

1 deterministic analysis must agree.

2 Now the biggest difference is that the safety classification is
3 deterministic so it's more conservative. It's going to have a more
4 conservative safety classification. Otherwise, the basic output of that is very
5 similar.

6 So if we go to the last slide, you'll see them side by side.
7 And the point I want to make is that the outcome of an LMP approach and
8 other risk-informed approaches like the IAEA -- risk-informed IAEA approach
9 are the same, and we should treat them under a single framework. If you
10 have a PRA-forward approach, the rule should be treating them identical.
11 And the problem now is, of course, as I mentioned earlier is that Framework
12 B has a lot of deterministic. And the NRC Slide A in their presentation calls
13 this the traditional framework, and traditional framework means traditionally
14 deterministic. And so we'd like to see the NRC reconsider Framework A to
15 be more inclusive of a PRA-forward approach. So thank you very much.

16 CHAIRMAN HANSON: Thank you, Mr. Henneke. I
17 appreciate that. Next we'll hear from Mike Shaqqo. He's the Senior Vice
18 President for advanced reactor programs at Westinghouse. Oh, wait.
19 Sorry. I apologize. Thank you. Sorry. We got Peter Hastings coming in
20 remotely. I apologize, Peter. He's Vice President for Regulatory Affairs and
21 Quality at Kairos Power. Mr. Hastings?

22 MR. HASTINGS: Good morning, Mr. Chairman,
23 Commissioner Baran, and Commissioner Wright. I'm grateful for the
24 invitation to speak to you today and humbled to be among this distinguished
25 group. And I apologize that the weather gods intervened and kept me remote

1 today. Next slide, please.

2 Kairos Power is a clean energy engineering company
3 working to develop and broadly deploy a fluoride salt-cooled, TRISO-fueled
4 high temperature reactor. In pursuit of our mission to enable the world's
5 transition to clean energy, with the ultimately goal of dramatically improving
6 people's quality of life while protecting the environment. Importantly, we
7 recognize that in order to achieve this mission, we have to prioritize our efforts
8 to focus on clean energy technology that's not only safe. That is, after all, the
9 price of admission for nuclear energy but also affordable. The primary focus
10 of Kairos Power's efforts is to reduce programmatic risks through iterative
11 development of cycles intended to provide technology certainty, regulatory
12 certainty, and cost certainty. Next slide.

13 As you likely know, we are in the middle of a construction
14 permit application review for the Hermes Demonstration reactor in Oak Ridge,
15 Tennessee. We've also engaged for several years in very active pre-
16 application engagement with the staff, culminating in the approval of eight
17 topical reports to date. Reports that apply to the Hermes non-power reactor
18 as well as to future commercial power reactors with three topicals currently
19 under review in parallel with the Hermes application. Our engagement with
20 the staff has been very, very productive and has included several aspects of
21 innovation on both the applicant side and the regulator side.

22 In addition to being a developer, we're also the owner-
23 operator of this first plant. So we have a somewhat unique perspective.
24 Also apart from our recent experience, my team and I have a substantial
25 amount of experience in navigating new regulations. I'll always think of

1 myself as the utility guy frankly having spent the first 30 years of my career at
2 a nuclear utility. And I've since led teams that have successfully executed
3 the first licensing action for a new facility under significant changes to Part 70
4 and participated significantly in the first round of licensing actions under Part
5 52, including utility leadership in seven AP1000 combined licensees. And
6 leading up to working at Kairos, I personally spent several years contracting
7 with TVA and the Electric Power Research Institute on SMR licensing and with
8 Southern Company, Nuclear Energy Institute, and the Nuclear Innovation
9 Alliance, as well as others on establishing regulatory framework for advanced
10 reactors, including the original licensing modernization project. I tell you all
11 this only to point out that this experience is what informs our comments today.

12 Next slide.

13 While I do want to acknowledge the significant amount of
14 effort on the part of the staff and developing the various drafts of the Part 53
15 rule, as well as outreach to stakeholders, I also have to concur with my
16 colleagues. First, the proposed rule as written adds burden and complexity
17 such that it's unlikely to be used or useful in its current form. Examples
18 include an increase and emphasis on ALARA as a design requirement instead
19 of a programmatic requirement, as well as including beyond design-basis
20 events and the design basis and duplicative operational programs. We take
21 to heart the staff's statements that none of those increases and burden was
22 their intent, yet we haven't seen changes to illuminate or mitigate the
23 increased burden.

24 Second, the distinction between Frameworks A and B is
25 overstated in the context of what ends up in the licensing basis. It's worth

1 paying particular attention in Mr. Henneke's graphic demonstration that the
2 result, the output of the two frameworks only varies by degree and that the
3 ultimate safety outcome of each framework is virtually identical, particularly in
4 the context of what ends up in the actual licensing basis. Part of its
5 complexity derives, we believe, from an effort to address a presumption that
6 the role of the PRA is so fundamentally different in a risk-informed approach
7 that it warrants elevating the PRA itself to its own place within the licensing
8 basis. In our view, this is not the case.

9 While the PRA tool may be more prominent in a risk-
10 informed approach than in purely determinist applications, there's nothing
11 magic about the PRA that should cause it to be perceived as more important
12 or more compelling than any of the other of hundreds of calculations and tools
13 used to establish a design safety basis. The way the process is sometimes
14 described frankly is almost as if a developer's first step is to create a PRA.
15 And then after turning the crank on a PRA black box, out spits a design, and
16 that's obviously not how design is done.

17 After Framework A was published, the industry attempted to
18 convey that the specificity on how a PRA is performed was not needed in a
19 rule and appears this was the genesis of Framework B. But as Mr. Henneke's
20 slides demonstrates -- excuse me -- the distinction of two frameworks is
21 somewhat artificial. And in any event, the PRA is not the final word on any
22 safety basis, nor does its increased usage warrant a fundamental revamping
23 of the content of the licensing basis. Next slide.

24 We want to convey a couple of additional really important
25 programmatic points. First to reiterate what many have said prior to this

1 meeting: Part 53 is not necessary to license advanced reactors. We know
2 this based on our clear understanding of the pathway through the existing
3 regulatory framework, indicated in the case of Kairos by way of an approved
4 regulatory analysis topical report.

5 Not only that, we also know Part 53 is not necessary to
6 license advanced reactors by simple empirical evidence based on the fact that
7 we at Kairos are in the middle of licensing an advanced reactor. As we
8 debate the merits of Part 53, it's really important to continue to signal not only
9 the policymakers but also to the market that Part 53, if successful, will make
10 licensing advanced reactors more efficient. But Part 53 in no way gates our
11 or anyone's ability to license a new plant.

12 Second, the burden of using the existing framework such as
13 exemptions is not only -- excuse me, is not as significant as might be
14 portrayed. Yes, it's a bit of a hassle. And yes, we at Kairos have expended
15 a non-trivial amount of time in our own regulatory analysis. But most of the
16 departures from the existing rule are not particularly controversial.

17 It hopefully goes with saying that if Part 53 does not reduce
18 burden, it is unlikely to be adopted. In the case where designs already have
19 a licensing basis under Part 50 or 52, there's unlikely to be a motivation to,
20 quote, convert to Part 53 later. In most cases, new designs are likely to select
21 the least burdensome pathway, whatever that is.

22 Part 53 therefore is likely to be adopted or not on its merits
23 based in large part on whether it's able to reduce regulatory burden compared
24 to other existing rules. One of the things that keeps me awake at night is the
25 notion that Part 53 doesn't hit the mark but that someone concludes, hey, we

1 expended a lot of effort on this, so it should be made mandatory for new
2 reactors. To be perfect fair, I've not heard anyone say this out loud. And I
3 have no indication that anyone is so inclined. But we want to state
4 unequivocally that consideration should not be given to make Part 53, quote,
5 mandatory in the future.

6 Honestly, even if Part 53 turns out to be better than what we
7 fear it would be promulgated in its current form. It likely will take some time
8 to demonstrate its value. And in the meantime, the well understood path
9 needs to continue to be made available to those who choose it.

10 Indeed, this concern is -- excuse me, is being demonstrated
11 in real time by the volume of new learning which continues to occur as part of
12 the implementation of Part 52, which has been on the books for some time but
13 whose first implementation isn't through the construction phase yet. Next
14 slide.

15 That will conclude my remarks, and thanks again for the
16 opportunity to comment. And we look forward to continued engagement on
17 this very important matter.

18 CHAIRMAN HANSON: Thanks very much, Mr. Hastings.
19 I appreciate that. Now we will go to Mike Shaqqo, Senior Vice President of
20 advanced reactor program at Westinghouse. Mr. Shaqqo?

21 MR. SHAQQO: Good morning. Thank you, and thank
22 you for the opportunity for us to -- for me as well to be here and to share our
23 perspective with you. So really appreciated that, and I appreciate the
24 openness and the ability to voice our opinion as part of this dialogue.

25 Again, my name is Mike Shaqqo. I'm the Senior VP with

1 Westinghouse responsible for development of advanced reactor within our
2 nuclear fleet. Go to the next slide, please.

3 So Westinghouse has over 14,000 employees around the
4 world supporting the nuclear industry and our customers. We along with our
5 -- within our Westinghouse have a strong belief that nuclear along with
6 renewables will play a significant role in being able to decarbonize the energy
7 sector, as well as to provide the energy need to support future demand.

8 We also have been through the years -- through the many
9 years, it started way back with George Westinghouse himself many decades
10 ago, a strong believer in having innovative solutions that we can put on the
11 table, especially in the area of nuclear energy. We believe the reasons for
12 these innovative solutions are driven by the fact that we need to provide the
13 optionality needed to support enabling these goals that we talked about in
14 terms of providing energy security and energy demand across all sectors of
15 the economy.

16 So with that said, currently we have our AP1000 which is
17 our grid-based technology that's about 1,100 megawatt electric design that
18 has been licensed by the U.S. NRC under Part 52. And also, that goes down
19 to from that one optionality to the smallest and most innovative technology
20 that we have which is our most advanced reactor technology in the area of
21 micro-reactor known as eVinci. Next slide, please.

22 So touching a little bit on AP1000, we have as you probably
23 know four AP1000 reactors that have been safely and reliably operating in
24 China. We also have two units here in the U.S. in Georgia that will soon be
25 going online as well.

1 In addition, we have seen a significant interest especially in
2 the last few years in terms of clean energy supply with our AP1000 technology,
3 specifically in Eastern Europe. So as I mentioned, AP1000 is not only
4 licensed by the NRC under Part 52. But currently, it's the most advanced
5 light-water technology in operation that has been developed in the western
6 world. Next slide, please.

7 So going down to the smallest, most innovative
8 technologies is our eVinci. I mentioned to the Commission before the
9 meeting, I'm most excited about this technology because the doors of this will
10 actually open in terms of being able to use clean energy at a distributed level.
11 eVinci is innovative in the sense that it operates just like a nuclear battery. It
12 will be deployed in a distributed manner to support localized energy supply,
13 whether it's heat or electricity, at the range of about 5 megawatt electric plus
14 14 megawatt thermal, additional if used in terms heat. The reason it operates
15 as a battery because it basically has minimal moving parts within the reactor
16 system. It also has the ability to operate for eight continuous years without
17 needing to be refueled.

18 In addition, our plan here is to design this reactor to be
19 distributed and shipped to site fully assembled in the factory. Last November,
20 we initiated the review with the NRC under the pre-application licensing
21 process where we have basically submitted to the staff our plan on how we're
22 going to engage prior to submitting a design certification. We followed the
23 guidelines of the NRC and the staff where it makes more sense to go in and
24 have a pre-application review to enable the understanding, to enable the
25 dialogue and open interface and productive interface with the staff to ensure

1 that when we moved to the design licensing phase, we have what is needed,
2 we have the understanding that's needed to de-risk that process as well from
3 a deployment perspective.

4 We are very appreciative of the effort and the support and
5 the productive engagement that we have had with NRC staff to date. Let's
6 go to the next slide, please.

7 So what's unique about eVinci and really micro-reactors in
8 general is the ability for this technology to be deployed at scale. What does
9 that mean? It means it would be deployed in tens or hundreds of units to
10 provide that localized energy supply for mines, for remote communities, and
11 later on for other distributed energy in industry to support their energy demand
12 in a clean way. So with that said, that model for deploying that technology is
13 somewhat unique and innovative. We believe the current regulations will
14 allow us to deploy it and have the ability to get the product licensed and out to
15 market. We are currently relying on Part 52 for the licensing of that
16 technology for the time being. Next slide.

17 So regarding Part 53 specifically, we are supportive of the
18 risk informed approach the staff has taken under the new rule. We are also
19 supportive in the fact that this is a technology inclusive new rule where in that
20 case, we'll reduce the amount of exemptions that will have to be taken for now
21 on light-water reactors.

22 In terms of key challenges, we echo what our colleagues at
23 NEI have said in terms of some of the key challenges that this rule will have
24 to address. Just to bring it specifically down to our micro-reactor technology
25 advancement and licensing, so we see the need for the rule to be streamlined

1 to allow it to actually be commensurate with the size of that reactor. A micro-
2 reactor, an eVinci reactor, is a lot closer to a research reactor versus a large
3 or midsize reactor.

4 The second thing, the rule needs to support at-scale
5 deployment. So that means it has to be streamed around the area of
6 transportation, as well as licensing and siting requirements. Go to the next
7 slide, please.

8 So in terms of Westinghouse priority, it's pretty clear. We
9 really need to continue to drive and support the deployment of AP1000 and
10 we need to support the licensing of the eVinci technology to allow us to deploy
11 to the market within the next five years. We also support the continuous effort
12 by the staff on Rule 50/52 rulemaking and the effort behind that is important
13 for the reasons that you see there. Let's go to the next slide.

14 So just real quickly to close then, so in summary, we are
15 supportive of having a risk-based regulation to enable the licensing of
16 advanced reactors. However, the regulation should minimize adding new
17 requirements and must be streamlined to support efficient and timely
18 deployment of these reactors. Thanks again for the opportunity.

19 CHAIRMAN HANSON: Thank you, Mr. Shaqqo. Next
20 we'll hear from Greg Cullen. He's a Vice President for Energy Services and
21 Development at Energy Northwest.

22 MR. CULLEN: Thank you, Commissioner. And really do
23 appreciate the opportunity to be here today. A little bit of background on
24 Energy Northwest. We are a joint operating agency in the state of
25 Washington that has 27 public power member utilities. But we have 92

1 participants in our projects over six states.

2 We operate in a region, as you know, a power system that
3 Washington and Oregon both have clean energy requirements now staring us
4 down. And as was stated by a leader in the public power arena and the
5 region recently, the number one issue facing the utilities in our region right
6 now is, where are we going to get clean, firm, flexible capacity? That's the --
7 as you said, the Holy Grail of this issue right now.

8 As you also probably known, we were involved with NuScale
9 and development of their technology for the last ten years or so and with
10 UAMPS and their project. But then we're also participants in both of the
11 ARDP awards and have shifted our focus to those in particular with the
12 development of the X-energy project in our region. And so that's left us in a
13 place of really a leadership role if you will in this development of new nuclear
14 and probably has led us to thinking a lot more about what operating an
15 advanced reactor and new reactors would look like than many other utilities at
16 this point.

17 We see a real future for this in our region. But from a
18 perspective standpoint while I'm here today, I want to make sure I'm clear.
19 I'm not a Part 53 expert. We're not digging into the details of this like some
20 of my peers at this table because, again, as you know, we're planning right
21 now a Part 50 application.

22 But as we look ahead, we do think about as first movers,
23 would there be an opportunity or a reason for us to move to Part 53 at the end
24 of it or use it in the future? And it's been alluded to a little bit today, we think
25 there are possible reasons to do that. One would be all centered around the

1 avoidance of a huge number of exemptions, right, that can lead to both maybe
2 public perception challenges as well as operational confusion out into the
3 future.

4 So the perspective I'm going to try to bring you today is not
5 just thinking about getting the first license issued but what we're going to have
6 to deal with for the 60, 80 years after that. And that's one of the things we
7 think about is a large number of exemptions might create a challenge going
8 forward on just clarity of what your licensing basis is. We think it can be
9 managed. But clearly in the end, we aren't going to make that switch unless
10 we believe that the benefits would outweigh the additional burden. Next
11 slide, please. Yeah, sorry. Next slide.

12 The rulemaking objectives, so we pulled these out of an
13 NRC staff white paper from July 2020. And I think these are really good list
14 of objectives for us to talk and think about. Particularly the first two on safety,
15 I want to highlight some language here about to at least the same degree of
16 protection as currently required. And in my terminology, for what it's worth, I
17 think of that degree of protection being sort of the combination of what you
18 have inherently in your design then plus the operational requirements of things
19 you might have during operation and control of that. So that's one way to
20 think of it. To me, those things should add up together to provide a same
21 degree of protection. So if we make advancements in the design, then those
22 should result in less operational requirements in order to still provide that same
23 degree of protection. Next slide, please.

24 So what are our interests? Well, I guess I kind of tie these
25 back to each of the objections we talked about. Clearly for all of us, the

1 number one thing is to make sure we still provide that adequate safety case
2 and provide that adequate degree of protection, that equivalent degree of
3 protection. We understand that there are still some questions about
4 advanced reactors, and it's on us as an industry to support our belief that these
5 have a designed in benefit that should be rewarded with reduced operating
6 burden.

7 But as we move on to the second interest, recognizing that
8 safer reactors should not translate into increased operational burden clearly
9 tied to Objective 3 which, again, talks about just providing that equivalent
10 degree of protection. Right now, we have some concerns. As we look
11 forward, one of the things for you to think about for us as a utility is we're
12 looking at making that decision to really commit to this and move forward.
13 And that's a risk decision, right? So we are thinking about what are the risks
14 associated with the licensing timeline. But again, what are the risks of
15 operational costs out into the future?

16 And so what we're looking for is some amount of
17 predictability to this. And so what we see right now are, again, some real
18 concerns about what seem to be potential operator burdens out into the future.
19 Probably the prime example is a facility safety program. This is something
20 new. And so it provides quite a bit of unpredictability for us as we think about
21 operating out into the future and what that could look like. There's quite few
22 as was talked about in the NEI comments, a proliferation of kind of duplicative
23 and what we think are sort of unnecessary additional program requirements,
24 things like that, that for us as an operator, provide a lot of uncertainty about
25 what that could look like in the future or what it could change to be as things

1 go.

2 The third interest, avoiding unnecessary complexities. So
3 first of all, now we've introduced some new terminology that again leaves us
4 with some uncertainty, unpredictability, and some ambiguity to that. Clearly,
5 there's time to resolve those things and try to provide some clarity. But again
6 for us from a risk standpoint, those provide risks that we have to understand
7 better before we're willing to say, hey, we know what it's going to cost us to
8 run these things. We know what it's going to take to get this licensed. And
9 then one other thing, this differing language for differing licensing processes,
10 again, probably not something you've heard before, but maybe? I don't
11 know.

12 But as we think about it now, there were some subtle
13 changes in this that I think are unnecessary but as an operator, provides some
14 complexities. So for example, the quality assurance program requirements
15 in Subpart K, there's a new one at the top. Everything else shifts down. And
16 so now you have Appendix B that has a certain list of criteria. And now you
17 have Subpart K that has a totally different numbering system and list. And
18 as an operator operating maybe Columbia Generating Station, a traditional
19 fleet, and then a new advanced reactor. We got two dialects we're trying to
20 speak as we try to operate. So I would encourage you just to think about
21 things like that, that obviously would affect the regulatory process as well as
22 we go forward.

23 And then finally, trying to ensure the licensing process
24 supports readiness for operation. And so kind of the old begin with the end
25 in mind, making sure that whatever we do here, whatever we set up sets us

1 up for the regulatory oversight process and how we manage that. And all the
2 risk-informed initiatives that we have out there that may not fully be utilized in
3 initial licensing but may be things we still would want to have access to later.
4 So making sure that we have all those things still in play.

5 And finally, next slide, just to kind of build on what Doug
6 said. We think there is so much need. We see it quite a bit in our region as
7 I kicked off talking about. Nuclear is definitely needed to support our nation's
8 goals for clean energy and has to be safe as we talked about. It has to be
9 firm and reliability. But it has to be cost effective and operationally flexible.

10 So cost effective, of course, as I said, we are having to be
11 predictable or looking for predictability in what we're doing in order to try to
12 make that determination. And then operationally flexible, just something I
13 would ask you to keep in mind as we go forward. These reactors are likely
14 to be used a little bit differently than the traditional fleet. We have to make
15 sure that the regulations support that. Thank you.

16 CHAIRMAN HANSON: Thank you, Mr. Cullen, for your
17 presentation. Next we'll hear from Dr. Ed Lyman. He's the Director of
18 Nuclear Power Safety at the Union of Concerned Scientists. Dr. Lyman?

19 DR. LYMAN: Yes, good morning. How's the sound?

20 CHAIRMAN HANSON: Sounds good. Thank you.

21 DR. LYMAN: I appreciate the opportunity to present the
22 views of Union of Concerned Scientists on this important topic. And I
23 apologize that COVID conditions continue to preclude my attending meetings
24 in person. May I have the next slide, please?

25 So I'm not going to repeat many of the objections that we've

1 raised at previous meetings. But overall, we do believe that the Part 53
2 approach remains problematic. I'm going to focus on a few of those issues
3 today.

4 As Mr. Cullen already pointed out, the staff's overarching
5 objective in Part 53 is to maintain the same level of safety and security as
6 currently operating plants. But in our reading, the current draft does not
7 clearly do that. And in particular, focusing on the standards for beyond
8 design-basis events or non-design-basis accident licensing basis events in
9 Framework A, the incorporation of the quantitative health objectives as
10 fundamental acceptance criteria will actually allow licensing of plants that are
11 less safe than the currently operating fleet.

12 Now with regard to all the operational programs in Part 53,
13 I disagree that as others have claimed that these maintain deterministic, are
14 not risk informed. We're concerned about a number of modifications to
15 current rules for what we see as important defense-in-depth qualitative
16 measures that really should remain in place no matter what the fundamental
17 design of the plant is. And one aspect I'd point out is our concerns about the
18 proposed Section 73.100 which would be available to any Part 53 applicant
19 and would essentially nullify the current physical protection requirements
20 across the board. May I have the next slide, please?

21 So with regard to the quantitative health objectives, I think
22 it's clear that Part 53 does meet specific quantitative acceptance criteria for
23 this category of non-design-basis accident events. But the QHOs are simply
24 not the right ones anymore because they represent the minimum level of
25 safety of the fleet as it was 30 years ago. In fact, in 1990, the Commission

1 already pointed out that the operating plants met the QHOs with margins.

2 And today, the operating plant average core damage
3 frequency is ten times lower than it was in 1990. In fact, the Vogtle Level 3
4 PRA just confirmed something like a hundred-fold margins to the latent cancer
5 fatality QHO. Next slide, please.

6 And this is clearly illustrated in a very helpful paper from Mr.
7 True a few years ago that shows the decrease in core damage frequency to
8 the operating fleet. Next slide, please.

9 So unless the rule requires that a large margin is maintained
10 to the QHOs, then in principle Part 53 applicants could have designs with
11 much higher core damage frequencies than the current fleet and still meet the
12 QHOs. Do I think that's likely to happen? No. But you are setting to stone
13 a regulation for generations and you need to keep that in mind.

14 There are other deficiencies that I've raised before with the
15 QHOs, one that does not include any kind of land contamination, a metric
16 which could be particularly important. If you have a small reactor, you may
17 easily meet the QHOs for individual risk, but you may also contaminate the
18 landscape in ways that aren't captured by those current criteria, and that
19 needs to be addressed. I've also pointed out that using metrics like average
20 cancer fatality risk of the general population is not sensitive to disproportionate
21 impacts of radiation exposure in disadvantaged populations.

22 In addition, the evolution of the understanding of ionizing
23 radiation -- the risk of low-level ionizing radiation is including non-cancer
24 endpoints like cardiovascular disease that should also be included. Next
25 slide, please.

1 So I think at a minimum, QHOs are not even included in the
2 rule. You've got to reduce them by at least a factor of ten, consider these
3 other endpoints for human health effects, and include land contamination.
4 Next slide, please.

5 Now with regard to PRA, I do think it's essential that a risk-
6 informed framework has a high quality, validated PRA with full understanding
7 of the uncertainties and incorporation of defense-in-depth to compensate for
8 those uncertainties. And that means to comply with an LMP approach, you
9 need a Level 3 PRA with all the elements of that technology. But it's become
10 clear that even for operating plants to actually do that in a defensible way and
11 have a good result is a massive effort. So I do agree it is a burden. But it's
12 an essential burden if applicants want to be able to use a risk-informed
13 approach. This is the key or the door to getting margin reduction for a whole
14 range of other aspects of operation. And to do that, you need to have PRA
15 where it's defensible in a quantitative sense to justify that. You can't get those
16 benefits for free. Next slide, please.

17 Now with regard to Framework B versus Framework A, as I
18 just said, if you're not going to have PRA, you can't have risk-informed
19 regulation. So Framework B is deterministic by design. So the confusion
20 among the other participants in this panel is why it's not risk-informed. Well,
21 it's deterministic by design because it's designed for applicants who don't want
22 to do a PRA. And if you recall, that was a request from the industry. So it's
23 a little -- it's actually absurd to then say that should be risk-informed somehow.
24 Now Framework B looks reasonable at first glance. I have some concerns
25 with its technical aspects; I won't go into those here. Next slide, please.

1 Now one example of the operational programs that I believe
2 are being weakened without adequate justification is this proposed section
3 73.100, which again would not require any particular finding with regard to the
4 radiological risk of a plant but would allow essentially the entire current
5 framework for physical protection of nuclear plants to be gutted. And I have
6 concerns that this would only shift the burden to the NRC inspectors and
7 analysts to figure out what, in fact, is going on at a site with regard to its
8 security programs. And I think it really should be stricken. Next slide,
9 please.

10 So you can't be a modern risk-informed regulator and
11 depend on policies that are 40 years old. And so I think it's critical that the
12 NRC really revisit the policies that would be put into place in this rule starting
13 with the safety goal policy statement, not only with regard to the QHOs as I
14 discussed but also with this fundamental question of advanced reactors and
15 whether they should meet a higher standard for safety in the current fleet or
16 not; I believe they should. In fact, what the NRC is doing is enforcing
17 mediocrity, in my view, and the views of Commissioner Asselstine underscore
18 that here. Next slide, please.

19 Also, you do you come across the statement in the record
20 that the Commission took a position that safety goals are not to be used to
21 make specific licensing decisions. It's not clear to me that was ever formally
22 retracted with an explanation. And so it seems to me that that also -- if that
23 policy is going to be changed and written into the rule, it's important for the
24 Commission to document that better than just making it in a Statement of
25 Considerations. Next slide, please.

1 And finally, NEI in a letter recently sent is using this
2 argument that we heard there may be hundreds of applications over the next
3 few years and we ask you better make sure the process speeds things up.
4 That's a false sense of urgency. I think realistically you're not going to get
5 anywhere near that number of actual applicants because frankly the financing
6 doesn't seem to be out there. But whether or not that's true, the NRC's
7 obligation is to public health and safety. And that has to be a fundamental
8 obligation, not the speed of deploying these reactors. So I think I'll stop there,
9 and I appreciate your questions. Thank you.

10 CHAIRMAN HANSON: Thank you, Dr. Lyman. And
11 finally for today's panel, we're going to hear from Jeff Semancik. He's the
12 Director of the Radiation Division of the Connecticut Department of Energy
13 and Environmental Protection. It's great to have someone here from the
14 states. We don't often hear from state agencies in this context. So Mr.
15 Semancik?

16 MR. SEMANCIK: Thank you, Chairman. Good morning.
17 My name is Jeff Semancik. I'm the Radiation Control Program Director and
18 the governor's appointed NRC state liaison officer for the State of Connecticut.

19 I want to thank the Commissioners for their time and
20 opportunity to address this topic of interest to the states. Next slide, please.

21 First let me note that these represent my views and not
22 necessarily those of our national organization, the Council of Radiation
23 Control Program Director, or all the other states. I also want to just disclose
24 that I am working with the National Academies of Science, Engineering, and
25 Medicine as a member on the working group looking at waste aspects of

1 advanced reactors and really can't comment much on anything within that
2 context. Next slide.

3 As I'm sure you know, the interest of the states vary widely.
4 However, I hope I can provide some meaningful insights and have attempted
5 to identify those topics that in my experience in conversation with other state
6 folks are general of interest for the states. And I'll use the terms, states and
7 we to kind of just identify that. Next slide, please.

8 With increasing attention on climate change and reduction
9 of carbon emissions, nuclear power does and is likely to continue to play a
10 major role in the efforts by states to meet carbon reduction goals, many of
11 which are codified in state statutes. Recognizing both economic benefits to
12 their communities and the contributions to the current reduction targets, many
13 states have provided incentives to ensure economic viability of existing units
14 and have even made statutory changes to incent new nuclear development.
15 Next slide.

16 The states also recognize that the Atomic Energy Act grants
17 the NRC the sole authority for regulation of nuclear power facilities.
18 However, as representatives of the communities in which these facilities are
19 located, states continue to maintain a very serious interest in matters that
20 could affect the health and safety of our citizens or the natural resources of
21 our states. We are committed to ensuring that all regulatory oversight is
22 conducted in an independent and transparent manner and provides for fair
23 treatment and meaningful involvement of all people. Next slide.

24 Specifically with respect to Part 53 rulemaking, we
25 recognize the congressional directive as well as the challenges inherent in

1 regulating complex technology, including the need for technical expertise.
2 We appreciate the NRC's efforts to engage with and incorporate feedback
3 from stakeholders during the regulatory process. However, most states lack
4 the specific experts in nuclear technology. So we rely on the NRC and other
5 experts to perform rigorous independent technical reviews and build a
6 regulatory framework that ensures safety remains the overall priority. Next
7 slide.

8 Although we understand the approach to developing Part
9 53, the complexity of the topics, the volume of information, the extent of
10 meetings challenges anyone attempting to follow the rulemaking or provide
11 meaningful feedback. For example, the most recent notice for comment on
12 Part 53 rulemaking contains 118 reference documents, several of which
13 represent hundreds of pages. The nature of the process which continuously
14 modifies proposed language makes it difficult to stay current. New
15 technology and new acronyms make it nearly impossible to keep up with
16 topics without significant preparation and research time, a time commitment
17 not available to most state programs with limited personnel. For members of
18 the public without industry experience, the challenge is made even greater by
19 the lack of plain language and an overreliance on broadband access to view
20 materials or participate in public meetings, both of which disproportionately
21 affect many of those in our environmental justice communities.

22 As a result, my experience through the limited participation
23 that I have been able to carve out of my other duties is that the process has
24 become dominated by industry stakeholders, vendors, and utilities with
25 dedicated staff to the process. Next slide, please.

1 While states rely on the NRC for technical reviews and
2 advanced reactor safety, we do have some overarching interest. First, we
3 feel it's important to maintain transparency in regulation and oversight. For
4 example, while many licensee-controlled programs such as surveillance
5 control or equipment classification can provide necessary reductions of
6 regulatory burden for licensees, they can create an unintentional opacity of
7 the program. For such programs, we would like to see publicly available
8 summary reports such as those currently required for facility changes made
9 pursuant to 10 CFR 50.59.

10 Likewise, we encourage continuation of requirements for
11 reporting off-normal events and environmental monitoring data. While
12 burden reduction actions may not be intended to reduce information available
13 to the public, even the appearance of reducing transparency can adversely
14 affect public trust. Second, we expect opportunities to be made for our
15 citizens, including those in environmental justice communities to provide
16 meaningful input to the process. Third, public confidence in and acceptance
17 of nuclear power facilities and their communities is based in part on their faith
18 and the preparation and competency of their local responders. When physics
19 leads to failures that engineers missed, we must be prepared to respond.
20 Even when systems function as designed, a good zero measured off-site is
21 essential to maintain public trust. Our experience indicates that licensees'
22 support is critical to ensure local responders are trained and ready, and we
23 believe this should be their obligation. Even with a well-organized national
24 response, local responders must be capable of responding to radiological
25 incidents in the first hours and days until federal resources and assets are

1 mobilized. Next slide.

2 While for reasons I have explained, the states have not
3 comprehensively reviewed all the proposed Part 53, a few areas have been
4 identified of specific interest. First with respect to radiation dose limits, I
5 would like to make two observations. We believe that off-site consequences
6 in terms of public dose limits should reflect the claims of inherent safety
7 improvements with the advanced reactors. We believe this is necessary
8 since these safety improvements and lower offsite consequence analyses
9 have been presented as the basis for reducing requirements for offsite
10 emergency response. For example, a public dose limit of 25 rem for
11 establishing the exclusion area is still five times the annual federal
12 occupational worker dose limit and equal to the emergency responder dose
13 guideline to conduct lifesaving missions. Second, the quality health
14 objectives proposed specify risk criteria for immediate and latent health effects
15 in terms of cases per 10 million years.

16 We're concerned that explicit use of these quality health
17 objectives vice specific radiation dose limits could result in licensees changing
18 dosimetry models to achieve these performance goals, rather than focusing
19 on improving plant safety and reducing offsite dose releases. The language
20 is also subjected to different interpretations. For example, it is not clear to us
21 over what time period immediate health effects refers, since significant acute
22 radiation effects manifest over a period of weeks, with radiation deaths being
23 measured by what we call LD 50/60 which represents the dose limit that will
24 result in 50 percent fatalities in 60 days.

25 Next, many states have extensive authorities including

1 those delegated by federal agencies to regulate non-radioactive discharges
2 and waste. Some states including Connecticut require formal environmental
3 justice plans for new electrical generators. As such, we're just interested in
4 coordination interaction of Part 53 with such state authorities.

5 Finally, we note that the recent Supreme Court ruling the
6 major questions doctrine holds that Congress must authorize federal agency
7 decisions on issues of major political and economic significance. Although a
8 recent ruling, we're still monitoring the application of this precedence to issues
9 such as the continued storage of nuclear waste and fusion. Next slide.

10 So what would we, the states, like to see for changes?
11 First, while we support reduction of unnecessary regulatory burdens, any
12 regulatory framework must maintain safety as its core principle. Second, we
13 recommend specific outreach on topics of interest for stakeholders beyond
14 industry representatives. And we provide the state liaison officers of the
15 CRCPD's committee on commercial nuclear power specific groups that could
16 provide such feedback.

17 And finally, we recommend in-person meetings with plain
18 language materials and discussions be held with broad geographic diversity.
19 And such meetings should be accessible to all members of the public,
20 including those that reside in our environmental justice communities. And
21 with that, I thank you for your invitation and the opportunity to discuss these
22 topics.

23 CHAIRMAN HANSON: Thanks very much, Mr. Semancik.
24 Thanks everyone for your presentations. We'll begin questions this morning
25 with Commissioner Baran.

1 COMMISSIONER BARAN: Well, thank you all for your
2 presentations and for your involvement in the Part 53 advanced reactor
3 rulemaking. This is a critical rule. It's also a tough rule with a lot of complex
4 issues to work through.

5 I'd like to start by asking about one of the issues that has
6 been under discussions for a while which is the overall safety performance
7 standard or criterion. The current Part 50 regulatory framework has a long
8 list of deterministic requirements applicable to light-water reactors. Part 53
9 of course aims to move to a technology neutral performance-based approach.
10 The rule wouldn't tell applicants prescriptively how to meet the safety
11 standard. There would be flexibility in a variety of ways to meet the safety
12 standard. But it seems to me that having a safety standard in the regulation
13 is central to the concept of a performance-based regulation.

14 The big question then is, what should the standard be?
15 The NRC staff has contemplated using the quantitative health objectives or
16 QHOs which were established in a 1986 Commission Policy Statement.
17 Based on your presentation, it sounds like there are a range of concerns about
18 using the QHOs in this way. Some stakeholders think the QHOs would be
19 too stringent. Others think they'd be too weak. There also seems to be a
20 concern about moving them from a policy statement into a regulation.

21 So let me ask a couple of big picture questions for anyone
22 on the panel who wants to weigh in. First, do you agree that a performance-
23 based regulation needs to include an overall safety standard or criterion?
24 And second, if you don't think that should be the QHOs, what should the
25 standard be? Doug?

1 MR. TRUE: So I'll jump in. It's not clear to me that it does
2 need to be in the regulation. So we have a really good example of a
3 performance-based rule in the maintenance rule. The maintenance rule -- in
4 the language of the maintenance rule, there's no performance criteria. It's
5 laid out that you'll have various programs, but the way it's actually
6 implemented is through a set of guidance that the industry actually developed
7 and the NRC endorsed as a way to meet those requirements.

8 And the actual thresholds that are used to monitor
9 equipment performance under that and adjust your maintenance practices
10 and monitoring are all contained in guidance. So probably our flagship
11 performance-based regulation that we have today in Part 50 didn't take that
12 course. To me, it doesn't need to be in Part 53 either.

13 COMMISSIONER BARAN: And so is that kind of the
14 direction you take, not having it in the regulation. And so that gets you around
15 the QHO problem because you just don't have a basic -- a core performance
16 standard --

17 (Simultaneous speaking.)

18 MR. TRUE: I mean, there are a whole bunch of
19 requirements in Part 53 beyond just having the QHOs in there. They're the
20 dose limits for different types of accident events that all come into
21 consideration before you ever even get to that endpoint final number, two in
22 this case, two numbers. Those numbers are the worst way to regulate
23 because it's all about what's between the design and there that actually
24 determines the level of safety. Understanding that number at the end of the
25 day isn't what's going to determine whether these plants are safe or not; it's

1 how all the rest of the frameworks put together. That's my personal opinion.

2 There may be some different views on that. But it's a -- I
3 mean, it's what we've said about hearing from PRA and PRA-related things
4 from the beginning. Don't focus on the number. Focus on what's getting you
5 to that number. I do believe we should confirm that plants do meet the safety
6 goal, whether you use a PRA for that or you use more of a bounding
7 assessment like the area approach for the micro-reactors to demonstrate that.
8 I think that's prudent and should be a part of the regulatory process for Part
9 53. But to me, there's no reason that makes it have to be part of the actual
10 regulation itself.

11 COMMISSIONER BARAN: Other thoughts or views?
12 Jeff?

13 MR. SEMANCIK: I think that may be true from an industry
14 perspective. I think from the public perspective, I think we do -- our folks do
15 expect to have kind of a cutoff criteria that kind of indicates a level of safety
16 that they can rely on. And despite all the other complexity of the process, it
17 should fit in. They know ultimately that it meets that criteria.

18 As I stated, I worry that basing it on cancer mortality or
19 immediate health effects is just going to complicate what we're trying to do
20 which takes focus away from improving the safety of the plant and maybe gets
21 us into dosimetry questions and radiation biology which are far from resolved
22 science in many respects and just could introduce opportunities for other
23 stakeholders to kind of interjecting unnecessarily on it. So in our view, I think
24 dose goals which have kind of been established throughout all the programs
25 at the NRC is kind of a standard way. I think it maintains the most

1 reasonableness going forward from our point of view.

2 COMMISSIONER BARAN: Okay, thanks. Greg?

3 MR. CULLEN: And just to follow up on Jeff's comment
4 which I agree with, I think I'll just go back to kind of what I -- some things I said
5 and to my comments. We have a language, a process on these dose
6 requirements that we all kind of are familiar with, we understand, we kind of
7 know how that all works. Why come up with a whole new set of things that
8 we're all going to have to figure out what that means and looks like going
9 forward? So I think as you said it, Commissioner, very well, we have
10 established requirements. The Part 50 requirements are basically just told
11 as prescriptively what you have to do to meet those. Why not keep the same
12 requirements and then just remove the how do you meet them piece?

13 COMMISSIONER BARAN: Dennis?

14 MR. HENNEKE: I appreciate the question. When we
15 talked about the QHOs coming into the rule, as a technical guy, I was fully
16 supportive of it. And Dr. Lyman was correct, the advanced reactors that were
17 analyzed in an order of magnitude well below the QHOs. And so meeting the
18 QHOs was never much of an issue for the truly advanced reactors like the X-
19 300 and the Sodium reactor. And so even if the QHOs were adjusted, we
20 shouldn't have an issue.

21 But if you look at the licensing modernization process, the
22 QHOs are part of the analysis. They are indebted in the analysis to determine
23 what's risk significant. The closer you get to the goals, the more things are
24 going to have to become safety related and so on.

25 But the LMP as I showed on my diagram, it supports a

1 deterministic analysis, and the deterministic analysis is the end result. It
2 says, here's my safety case. Here's what I need to provide as part of my
3 license. It informed by the PRA and is informed by the QHOs. But in the
4 end, that deterministic safety analysis is what we stand on for the safety case.
5 And that's a risk-informed approach.

6 Inputting the QHOs, NEI has a really nice argument on this.
7 Inputting the QHOs as part of the requirements, what you've done now is taken
8 the PRA which is informing all of this analysis and bringing it part of the license.
9 And so any change in the risk assessment, these are big, big analyses and
10 big documents - a Level 3 PRA is tens and tens of thousands of pages - now
11 becomes part of the license basis and any change that we do to our analysis,
12 NRC provides us new generic data. All of a sudden, we have to inform the
13 NRC, hey, we've changed our analysis; here it is and resubmit. And that
14 burden really doesn't make any sense. QHOs are needed as part of the
15 support for the analysis, but not in the rule itself. Thanks.

16 COMMISSIONER BARAN: Let me just make sure. The
17 folks who are virtual, anyone want to weigh in?

18 MR. HASTINGS: Yeah, this is Peter Hastings. I'll start
19 and I think Dr. Lyman's hand is up as well. I think we run the risk here, no
20 pun intended, of miscommunicating. Fundamentally, the rule already has
21 performance-based criteria, the 25 rem requirement for design basis
22 accidents, the 1 rem requirement for normal op, and the requirement to
23 mitigate beyond design basis events. That's not changing. QHOs aren't
24 needed for the implementation of Part 50 or 52 and not needed for Framework
25 B.

1 It's the getting to that that's the challenge. And because
2 there are multiple pathways to get there, risk-informed safety analysis simply
3 can't be boiled down to a single quantitative metric unless you're going to
4 dictate a specific methodology. The licensing modernization project uses the
5 risk target curve. And that's one effective way to get there. But to assure
6 the safety of reactors, the industry has a very long history of using defense-in-
7 depth, uncertainty identification and quantification, margins, operational
8 programs, and expert judgment to assemble comprehensive safety cases.
9 And trying to prescribe the specific methodology and the specific submetrics
10 on how to get there isn't productive and limits flexibility and argue as a burden.

11 COMMISSIONER BARAN: Thanks. Ed, do you want to -
12 - you can have the last word on this one.

13 DR. LYMAN: Thanks. Yeah, I agree. The numerical
14 standard should not be the only one; it should complement the others. But
15 just to point out why I think you need to have this in the rule, going back to the
16 post-Fukushima, the Near-Term Task Force recommendations, they pointed
17 out that the current licensing basis for the operating fleet inconsistently treats
18 severe accidents. And in that case, it went to some non-conservatisms with
19 regard to Fukushima-type events. The Commission essentially punted on an
20 attempt to try to solve that problem consistently. And now you have another
21 opportunity to do that, to be able to have a framework for treating beyond
22 design basis accidents consistently and with clear standards in the rule that
23 would allow for clear inspection enforcement objectives. So you have an
24 opportunity here to fix that outstanding problem that the Near-Term Task
25 Force identified and you should take it.

1 COMMISSIONER BARAN: Well, thank you all for sharing
2 your views. Oh, yes.

3 MR. SEMANCIK: Can I just offer one other thing?

4 COMMISSIONER BARAN: Sure.

5 MR. SEMANCIK: QHOs are based on latent cancer
6 mortality. That's one of those areas of potential where does the overlap occur
7 with state's authority. So if I'm regulating toxic hazards, other waste on there
8 and I'll get a cancer mortality, is there some desire or what's the overlap of my
9 cancer mortality with yours and do they add. It just creates that overlap that
10 doesn't exist if we kind of use a different standard that we're kind of used to
11 which is on the radiation dose side.

12 COMMISSIONER BARAN: Thank you all for weighing in.
13 I appreciate it. Mr. Chairman, we looked at one issue. I'll leave all the other
14 issues to you and Commissioner Wright.

15 CHAIRMAN HANSON: Well, it was a big issue. Thank
16 you, Commissioner Baran. Commissioner Wright?

17 COMMISSIONER WRIGHT: Thank you. And as we just
18 saw, ten minutes goes by quick and that was very good dialogue. So I'm just
19 going to dive right in. Doug, we'll come to you. Good morning. Good to
20 see you again.

21 MR. TRUE: Good morning.

22 COMMISSIONER WRIGHT: I think from one of your
23 slides, around seven or so, you talked about Framework B and you said which
24 is geared toward using traditional licensing approaches. But I think you said
25 it's unlikely to result in fewer exemptions in Part 50 and 52. And I've heard

1 those statements before, but I've not heard meat put on the bone. And so I'm
2 trying to get a little bit -- we've heard a little bit today which is good. Can you
3 provide me maybe some examples that illustrate that? And is this only a
4 concern maybe with Framework B?

5 MR. TRUE: Primarily a concern with Framework B. I
6 might let Dennis -- I think Dennis has some better specific examples that would
7 be useful. Sorry, Dennis. Put you on the spot.

8 MR. HENNEKE: As far as Framework A, I mean, there are
9 still concerns there. For example, when talking about beyond design basis
10 events, the hazards are treated similar to a safety analysis postulated initiated
11 event. So whether it's a fire or a seismic event or whatever, it's treated very
12 similar to a LOCA, how a LOCA was in design basis arena. However, when
13 you come down to it, there are deterministic criteria, such as all safety related
14 and NSRST, non-safety with special treatment, components need to be
15 protected from effects of a fire or protected from -- or seismic qualified.
16 Protected from a fire, they may have been safety related because of a LOCA
17 analysis.

18 They're not necessarily safety related because of a fire. So
19 all of a sudden, we have to come back and say, no, we don't need to protect
20 this component for seismic or high winds or other things because it's not relied
21 on for safe shutdown during a high wind event or a seismic event and so on.
22 So there's still lots of deterministic parts of even Framework A and even more
23 so in Framework B. And we're going to have to come back and say, no, we
24 don't need to have it because of this reason. I don't know if that's an
25 exemption space. Definitely in the technical space, there's still lots of

1 overlying requirements that we're going to have to ask for exemption.

2 COMMISSIONER WRIGHT: And I'm going to say anybody
3 in the panel can jump in at any time. I want to go to the next question. And
4 Dennis, you did address this a little bit in one of your slides earlier.

5 So we've heard that as -- and I've heard a lot of it that as
6 currently proposed, there would be minimal benefit to using Part 53 given the
7 perspective of an increased burden, right, as compared to Part 50 and 52. I
8 even heard all you all say that today. And I agree we've got to have a rule
9 that's not just useful and usable. But I've heard it again today. You all said
10 and reduced burden, right? And I've talked with staff. And when we have
11 these conversations, it stays at that real high level. And I think that even the
12 staff would say if you would give me a specific example, then maybe we can
13 talk about it, right? And Dennis, you mentioned a few, I think on your Slide 6
14 or Slide 2. Can you provide me maybe some more examples or two of where
15 Part 53's Framework A or B options reflect an increased burden and how could
16 it be reduced, right, because I think that's where staff would like to engage.

17 MR. CULLEN: Again, without being able to dive too deeply
18 into the specifics, I'll just continue to use the facility safety program. From our
19 perspective, that looks like an unfixed in time design basis potentially, right?
20 That we're constantly evaluating, well, here's a new threat. Here's a new
21 thing. It looks like potential for a 60-year. Every year, we have to revisit
22 what should our design basis be and what do we need to make as far as
23 changes to the facility or to how we do things in order to keep meeting
24 perception of new things that someone identified as a concern. So that's just
25 an example that for us it just provides us a high level of uncertainty and

1 unpredictability out into the future.

2 COMMISSIONER WRIGHT: And Peter, you can jump in
3 too anytime. Yes, Dennis.

4 MR. HENNEKE: So let's go through some real examples
5 here. So under Framework A or Framework B, definitely we have expanded
6 to beyond design basis event analysis. And part of them is where now having
7 in the license the requirements for safety-related components as well non-
8 safety with special treatment, NSRST.

9 And those are still the -- even under Part 50, those show up
10 in the SAR. And the requirements associated with the beyond design basis
11 components and NSRST components now become part of the license. So
12 what you're taking now is all the base requirements for quality assurance and
13 testing and equipment qualifications. And you're bringing them over with
14 really not much of a reduction in that. And then you're adding to that scope
15 all of these non-safety with special treatment components into the license
16 requirement. And the license now is expanded by a factor of two just simply
17 because the NRC wants to see what you're doing for testing for these NSRST
18 inspections, any special treatment that you have. And so that burden, that
19 additional burden is required by Part 53, it's fine if we had burden reduction in
20 other places. But we're not seeing it. As I mentioned in my slide if I had --
21 and our two reactors are exactly this.

22 If you have failsafe design, a fire occurs in any location, yhe
23 rods go in and cooling starts. In the case of Natrium, it's air cooling. You
24 don't have to start it. It's already there. It turns on. Fire damage to anything
25 doesn't cause any public risk problem. What's the minimum fire protection

1 program I have to have? And the answer is you have to have a fire protection
2 program like anybody else. You can't get rid of fire protection. So if I could
3 get rid of a fire protection burden, we're still going to have fire protection. But
4 that's part of the license. If I could get rid of that, then that burden reduction
5 could make up for what we have to analyze in beyond design basis events.

6 COMMISSIONER WRIGHT: Peter, do you – Michael?

7 MR. SHAQQO: Yes, thanks, Commissioner Wright.
8 Yeah, I mean, just to touch on it, I'm not the licensing expert here. But I can
9 tell you from the deployment perspective, the examples you see about
10 additional programs, as we look at these and as we look going through the
11 pre-application process now for eVinci, which rely on Part 52 because that's
12 what exists today. The biggest challenge for us is bringing that new
13 technology to go through the licensing process and taking it to market is any
14 new requirement. Additional requirements does not support the safety
15 aspect like what Dennis is talking about and Greg is talking about.
16 Introducing those requirements increases our risk in being able to really meet
17 and continuously meet data operation over time because for two reasons.

18 One is it's new, right? It's a new technology that we're
19 licensing. But also it's a new regulation. So with new requirements, it's
20 going to add that additional burden of not knowing it and not going through it
21 the first time.

22 The second piece is as the burden in terms of being able to
23 continuously operate at an effective way that without having these additional
24 burdens that have no impact on safety programs, additional programs that
25 have been contemplating inclusion of ALARA potentially. It's not clear if it is

1 or isn't. You're going to be in as far as the licensing basis. These additional
2 requirements from a deployment perspective, it creates that additional burden
3 that's really to us as a developer gives us some level of uncertainty, not we
4 cannot meet them. That's not the issue. It gives us a level of uncertainty
5 about the schedule, the delivery, the ability to get this product out to market.

6 It's just a different perspective on why that burden will create
7 a challenge for us, not because technically we can't meet them. We know
8 we can. It's more of what is this additional burden that will impact us from
9 being able to deploy that technology. Just another perspective.

10 MR. TRUE: I'll let Peter jump in, and then I'll maybe close
11 it.

12 MR. HASTINGS: So I'll add these are all really great
13 examples of a facility safety program, the sort of elevation of beyond design
14 basis into the design basis. We mentioned earlier the elevation of a PRA to
15 a different role in the licensing basis, the codification of QHO limits. I
16 mentioned in my remarks the elevation of ALARA to design requirements
17 instead of programmatic requirements. These sort of all end up manifesting
18 themselves in increased level of detail on the docket and in the license that
19 just makes the license more burdensome to maintain for no apparent benefit.
20 I'll say maybe even more fundamentally what we have seen is a distinct effort
21 to decrease burden in Part 53. Looking for target areas where the burden is
22 actually demonstrably decreased compared to 50 and 52.

23 And I think I'll go off script a little bit here. I think part of the
24 challenge here is we, the industry, have provided comments on all these
25 things multiple times and it's not that the staff aren't listening. I think what

1 we're lacking because of the compressed schedule for getting this rule put
2 together is the lack of an ability to have a real meaningful two-way dialogue
3 on these issues.

4 COMMISSIONER WRIGHT: Doug?

5 MR. TRUE: Peter said it very well. What I was going to
6 say was we submitted 100 pages of comments in November last year that
7 outlined all the additional areas of burden, examples of those. And today I
8 think the majority of them still exist. Very few have been addressed. So I
9 think one of the reasons I wanted you to hear from the individual
10 representatives of the technologies is because we've been saying it, NEI's
11 been saying it all along and it's not getting through. So hopefully we got
12 through today. Thank you.

13 COMMISSIONER WRIGHT: Thank you.

14 DR. LYMAN: And if I could just jump in, Commissioner.
15 You didn't hear me say that reducing burden is necessarily an objective in
16 itself. Reducing burden has to be earned. And also when you're talking
17 about new untested reactor technologies, maybe it is appropriate to have more
18 burden. You don't have the operating experience to justify reducing burden.
19 But over time, that can be earned. But I don't think the rule itself should
20 demonstrate reduced burden. It should have a process for how that can be
21 done, once it's earned.

22 COMMISSIONER WRIGHT: Thank you. Thank you, Dr.
23 Lyman. And Mr. Chairman, I do agree with Mr. Hastings' earlier point when
24 he was talking about the dialogue. I know that we've got all these meetings
25 and it's all -- but it does seem like there needs to be more dialogue, right?

1 And so I encourage you to do that. And one of the things I
2 was trying to reach at today was if we can point out those specific things, then
3 maybe staff can focus their efforts more as you can, too. And I've got two
4 questions in, Mr. Chairman. The rest are up to you.

5 CHAIRMAN HANSON: Well, let's see if I can meet or beat
6 that. I'm not optimistic at the moment, given the complexity of the issues; and
7 I think both of my colleagues have raised important things. And, in fact, I'm
8 struggling a little bit here, I think, to kind of find that right insertion point
9 because I think we've got a bunch of issues here.

10 I think a critical one is the NRC's role in confirming or
11 determining the safety of the designs in front of us and doing so in a way that
12 is straightforward, let's call it that, and clear for both applicants and for the
13 public. And so one of the things, I think – I want to touch on this in a couple
14 of different directions. One is potentially about the complexity of the rule for
15 applicants and the public and being able to see inside of that about how we
16 are making our determinations. About the permeability, I will call it, between
17 Frameworks A and B or B1 and B2. I think Mr. Henneke spoke rather
18 eloquently about that and the potential need to not necessarily, you know, if
19 you're in one, you know, the twain shall not meet.

20 But I'm going to start with, Doug, you made this kind of
21 comment at the beginning about how you thought the difference between
22 predictability and flexibility was a little bit of a red herring, and I think Dr. Lyman
23 brought this up as well. So let's start kind of with that conversation, and I
24 guess I'd ask you to kind of expand on that a little bit because I do think of
25 predictability and flexibility as kind of being on a spectrum and there being

1 some tradeoffs there.

2 MR. TRUE: Well, certainly, we want to get to a predictable
3 endpoint. Everybody wants to get to that, so we need to end up there. But
4 I think that the question is how much are you putting in the regulation and how
5 much of that prescription needs to go into the regulation? For example, take
6 Dennis's example on the different ways you can get to licensing basis events
7 and beyond design basis events, use PRA or use the other way. Framework
8 A shows it to be very specific; PRA must be used for these following things.
9 You could change that; and, in fact, we proposed this in November and
10 actually maybe even before that, to say, you know, PRA should be used, it
11 should be used as a tool, but there are other ways to do it, rather than requiring
12 that it's strictly done with that, using PRA as that way to get to that endpoint.

13 That kind of provides some predictability because it's clear
14 that's what you have to do, but you're prescribing a method in the regulation.
15 Then you spend all your time arguing about that method where you could have
16 actually had different ways and done it through guidance. And when we
17 offered to try to take that point and expand it into guidance, it would give you
18 the means to do what Dennis described, but that wasn't of interest and we
19 ended up with whatever it is, three-hundred and something new pages or five-
20 hundred pages with Framework B that is going to go into the wrong direction
21 of being able to be scrutable and understandable because now we've got a
22 regulation that's even more massive than it was when we had just Framework
23 A.

24 That's why in one of my remarks, I pushed back to say, well,
25 shouldn't we look into how do we take a framework and make it be workable?

1 That may require putting more in guidance, but that's okay. We do that today.
2 Nobody is saying today's system isn't predictable. We haven't been
3 complaining about unpredictability. So that's kind of where we're coming
4 from. To make it predictable doesn't mean it has to go in the regulation.

5 CHAIRMAN HANSON: I see. Okay. Anyone else want
6 to weigh in on that?

7 MR. CULLEN: Commissioner, maybe the other way to
8 think of it, too, is, you know, not each section or each thing we're talking about
9 here might have aspects of predictability and flexibility within them and it's not
10 necessarily everything on that one continuum. So, for example, again, in my
11 simplistic view, what I sort of hoped we would accomplish with this process
12 was, you know, Part 50 established very prescriptive requirements about how
13 you meet these things. You know, as we watched NuScale go through the
14 process, you know, it was a lot of beating their way down from those
15 prescriptive requirements to where sort of they should end up based on their
16 designed-in safety aspects. I was hoping we kind of had a process that said,
17 well, let's look at the designed-in safety aspects and then establish from there
18 what the requirements may need to look like.

19 So to some extent, that provides some flexibility, you know,
20 how you establish what you're going to have to meet in order to provide the
21 same degree of overall safety has flexibility in that, depending on what you
22 can bring to the table in your design and demonstrating that in the design has
23 been brought up several times today. But then you start getting to other
24 areas and, again, from my simplistic perspective, things like the facility safety
25 program seems like it comes out of nowhere and has nothing to do with that

1 first. It's fixing something somebody has as an existing problem that they
2 wanted to solve. That brings a lack of predictability, but it doesn't really speak
3 to the flexibility of what we were looking for with a Part 53 rule that could be
4 specific to the design. So I guess there are just different aspects to this that,
5 you know, again, it's not all on that one continuum of flexible versus
6 predictable.

7 CHAIRMAN HANSON: Please, Mr. Semancik.

8 MR. SEMANCIK: Yes, I think there's merit in moving some
9 of the guidance into guidance vice regulation, in simplifying the message of
10 the regulation, not only to the industry but to the public, right? I hear the
11 overarching very finite safety criteria that we can defend, how we achieve
12 those safety criteria, you know, if you can simplify, get some of the complexity
13 of the regulation and get it into a guidance document, that does, you know,
14 into reg guides or whatever, that does have some merit in simplifying the
15 amount of language in the rule itself.

16 CHAIRMAN HANSON: We have a lot of competing
17 demands, right? I mean, I think some of the complexity that's ended up in
18 the rule has been the result of trying to accommodate a lot of different
19 technologies where the staff has kind of gone out and said, hey, we'd like to
20 kind of have an overall approach about this, and various folks have raised their
21 hand and said, well, what about my thing over here and what about my thing
22 over here?

23 We also have the mandate to be performance-based, and
24 so, you know, being performance based implies, kind of by definition, having
25 performance standards or by having a clearly-defined methodology of

1 demonstrating safety. And so I think there's a lot of things that are here at
2 play, and then trying to simplify that in a way that's understandable for
3 everybody, too, because there is that imperative, I think, at the heart of this in
4 the various pieces of show your work. It's proving safety; it's not asserting
5 safety, right? And we do have a framework in 50.69 and other things now
6 where you get flexibility by providing additional information.

7 I do agree with Mr. Henneke, and I do worry about
8 Framework A a little bit because PRA is a massive undertaking. It's a multi-
9 year effort, you know. I mean, Palo Verde and other licensees have achieved
10 that, but it was a multi-year effort, even with the existing fleet. And so there
11 is a, you know, I do have this thing about Framework A in its purest form and
12 usability or attractiveness there. But I also have some concern about the
13 level of, again, about showing your work and proving safety and not just
14 asserting safety, that there are things that I think, Mr. Semancik, you said,
15 things should be analyzed and not just -- I don't remember what it was now --
16 reported or et cetera because I think there are some elements out there who
17 want all the predictability of a structured and performance-based rule but
18 without any performance standards.

19 So the issue that Commissioner Baran raised is, I think, a
20 really important one of, you know, I think he was more polite than I'll be, which
21 is kind of, okay, if not QHOs, and I get there are issues around the QHAs, well,
22 then what? And I'm sensitive to Mr. True's argument, as well, that, okay, look,
23 it's not about the number at the end of that, it's about how you get to that
24 number and how you get from point A to point B, being transparent and robust
25 and so on and so forth, right?

1 I don't have any answers to this. I'm trying to kind of clarify
2 the issue so that we can go on to the next conversation with the staff, and we
3 can then put all these things to them --

4 MR. HASTINGS: Mr. Chairman.

5 CHAIRMAN HANSON: -- as we go about this. So,
6 please, Mr. Hastings or Dr. Lyman.

7 MR. HASTINGS: I think this is a really insightful question
8 and a really productive conversation, and you've introduced the topic with
9 citing the NRC's role in confirming safety. You initially said determining
10 safety, and I think that's sort of an important distinction because the NRC's
11 role isn't to determine safety, it's to confirm safety. It's the licensees', it's the
12 applicants' job to determine safety and then make that demonstration. And
13 the show your work line, I've used that hundreds of times to my team and
14 within the industry.

15 I think that, and I'm sympathetic to the staff. I am. The
16 staff wants more specificity, so they aren't criticized for their reviews being sort
17 of one-off in every case and non-standardized and, therefore, taking a long
18 time. But the presumption that if it's not in the rule it won't get done is simply
19 specious. It doesn't reflect any of the experience that we all have where the
20 implementation of guidance is very often the answer to the pathway through
21 the minefield, if you will, to get to the ultimate requirements as stated in the
22 regulation. And I think the model of having, either through consensus
23 standards or NRC-endorsed guidance, describe the acceptable pathways to
24 get where you're going is the real key to this conversation because if it all gets
25 piled into the rule and nobody uses the rule, then it won't have accomplished

1 anyone's objectives. The fact is that the show your work mandate, if we
2 agree absolutely is a mandate, it's done every day in audit space and with
3 supporting document reviews for what's in the actual licensing phases.

4 CHAIRMAN HANSON: Thank you, Mr. Hastings. Mr.
5 Lyman, I don't want you to be left out. If you had some thoughts about this,
6 I'd be happy to hear them.

7 DR. LYMAN: Yes, just to be -- let's be clear about what the
8 difference is between what's in the rule and what's in the guidance and why
9 the industry wants to have as little in the rule as possible because that will
10 reduce the opportunities for inspection findings, violations, and enforcement
11 actions. The more that's piled into the guidance, the more subjectivity there
12 is to come up with alternative means of meeting regulation that are outside of
13 the scope of enforcement. And from the point of view of the public, take the
14 security rule, it's especially important there because that kind of sausage-
15 making is not going to be apparent to the public. All they know is what's in
16 the rule and whether or not that's being met. So, certainly, for aspects where
17 the public will be less privy to those details, it's important to have those clear,
18 inspectable, and enforceable criteria in the rule to bolster public confidence.

19 CHAIRMAN HANSON: Okay, thank you. Well, with that,
20 I think we've probably come full circle. Thanks, everybody, for your
21 presentations. We'll wrap up this first panel now, and let's say we'll
22 reconvene at 10:50. Thanks, everybody, very much. Really appreciate it
23 and good discussion. Thanks to my colleagues, as well.

24 (Whereupon, the above-entitled matter went off the record
25 at 10:42 a.m. and resumed at 10:51 a.m.)

1 CHAIRMAN HANSON: This meeting will now
2 recommence with the NRC staff panel. We'll be led off today by Deputy
3 Executive Director for Reactor and Preparedness Programs, Darrell Roberts.
4 Darrell, the floor is yours.

5 MR. ROBERTS: Okay. Thank you and good morning,
6 Chairman Hanson and Commissioners. We are pleased to be here today to
7 provide an update on the agency's activities to support 10 CFR Part 53 and
8 the licensing and regulation of advanced nuclear reactors.

9 Part 53 continues to be a remarkable effort by staff and
10 stakeholders to develop a technology-inclusive risk-informed, and
11 performance-based regulatory framework and represents a cornerstone in
12 NRC's strategy to prepare for the licensing of advanced reactors. The NRC
13 staff remains committed to our vision of developing an innovative, predictable,
14 and appropriately-flexible framework to enable the efficient and reliable
15 licensing of advanced reactors.

16 The staff is making significant progress and is on schedule
17 to deliver the proposed rule to the Commission in February of 2023. The
18 schedule extension approved by the Commission last November has allowed
19 the staff time to develop a traditional technology-inclusive alternative in
20 response to stakeholder feedback.

21 Part 53 now has two distinct frameworks, as you've heard
22 earlier today and will hear more about later. The additional time also allowed
23 the staff to further engage stakeholders on key issues. The staff has
24 considered the extensive stakeholder feedback and adjusted the language to
25 further improve the proposed rule. The result is an enhanced version of Part

1 53 that recognizes the benefits of a flexible regulatory framework, allowing
2 potential applicants to select a best-fit path towards regulatory reviews and
3 decisions.

4 As you'll hear today, the staff has worked diligently to
5 identify and prioritize areas needing guidance and has issued major pieces of
6 advanced reactor guidance recently. Although the rulemaking is on track to
7 be completed well before the NEIMA required date, challenges do remain.
8 Most notably, the completion and management review of the entire proposed
9 rulemaking package to include the statements of consideration, the supporting
10 regulatory and environmental analyses, and a compilation of guidance
11 supporting the rule will be a heavy lift for the staff over the next seven months.
12 In addition, the staff is continuing to explore whether additional flexibilities
13 could be added to the rule to address the needs of microreactors and other
14 designs, as the staff learns more about the plans of developers in this unique
15 class of advanced reactors. Next slide, please.

16 I would like to now introduce the panelists who will talk about
17 the agency's activities to support Part 53 licensing and regulations of
18 advanced reactors. Our first speaker during this panel will be Rob Taylor, the
19 Deputy Director for New Reactors in the Office of Nuclear Reactor Regulation,
20 or NRR. He'll talk about the development of ruling for Part 53. After Rob,
21 Mo Shams, NRR's Director of the Division of Advanced Reactors and Non-
22 Power Production and Utilization Facilities, will discuss the current status of
23 the rulemaking package. Following Mo, you will hear from Steven Lynch,
24 Branch Chief of NRR's Advanced Reactor Policy Branch, who will provide an
25 overview of risk-informed licensing approaches in Part 53. Next, you'll hear

1 from Lauren Nist, a Branch Chief in the Division of Reactor Oversight and
2 NRR. She will discuss staffing flexibility in Part 53. And, finally, Tony
3 Bowers, a Branch Chief in the Division of Physical and Cybersecurity Policy
4 in the Office of Nuclear Security and Incident Response, or NSIR, will discuss
5 fitness for duty and access authorization frameworks. That concludes my
6 opening remarks. And next slide, please. So without further ado, I'd like to
7 hand the presentation over to Rob Taylor.

8 MR. TAYLOR: Thank you for the introduction, Darrell.
9 And good morning, Chairman and Commissioners. It's a pleasure to be here
10 today. Next slide, please.

11 The successful completion of Part 53 is critical to effectively
12 positioning the NRC to address the changing landscape in the world of new
13 nuclear reactor development. The NRC staff is engaged with 15 vendors in
14 pre-application and has been informed that more than ten applications could
15 be submitted over the next five years. While Part 53 won't be available in
16 time for the early licensing of some designs, the work being done to develop
17 creative risk-informed, technology-inclusive, and performance-based
18 requirements is paving the way today for thinking differently about these early
19 movers.

20 For example, to support early movers, the staff has issued
21 important advanced reactor guidance related to fuel qualification, including
22 guidance for specific design types, and developed a comprehensive website
23 on accident source terms, including information relevant to the development
24 of non-LWR accident source terms for licensing. Both of these initiatives are
25 key to supporting advanced reactor developers, most of which will be using

1 new fuel types not previously reviewed by the NRC, and they represent areas
2 that are indicative of how we are innovating to support these early movers.

3 Part 53 itself is part of a tapestry of innovative advanced
4 reactor activities the NRC staff is undertaking, including developing an
5 advanced reactor generic environmental impact statement, creating graded
6 emergency planning requirements, and adopting new standards for high-
7 temperature materials and probabilistic risk assessment, among many others.
8 Specific to Part 53, the staff's efforts to re-envision the approaches to quality
9 assurance programs, security requirements, operator licensing, and other
10 traditional licensing approaches are facilitating early engagement and
11 resolution of issues necessary to provide for timely and reliable licensing. To
12 date, the NRC has completed the review of 14 topical reports and 19 white
13 papers for vendors during pre-application activities. We expect to receive
14 another 24 topical reports and 31 white papers by the end of fiscal year 2023.

15 Like all of our advanced reactor activities, the staff is
16 approaching the development Part 53 with an emphasis on our principles of
17 good regulation, such as openness. We're utilizing a novel rulemaking
18 approach to help achieve clarity and reliability while enabling flexibility where
19 appropriate. We're engaging stakeholders on specific topics and have
20 demonstrated our willingness to change positions of the rule based on that
21 feedback. The Part 53 effort directly supports our goals to be a modern risk-
22 informed regulator through a more efficient, timely, and resource-focused
23 licensing of new and advanced reactor technologies. Next slide, please.

24 The staff has effectively used a schedule extension granted
25 by the Commission last fall and is making significant progress toward

1 compiling all the work into a comprehensive rulemaking package. The
2 Commission-approved schedule extension has yielded the benefits
3 envisioned. The extension has enabled enhanced stakeholder engagement,
4 rule optimization, alternative licensing approaches, and responses to key
5 stakeholder input. Specifically, the staff has restructured the rule to include
6 two versatile frameworks in response to stakeholder feedback to broaden the
7 licensing approaches available to advanced reactor applicants. These are
8 Framework A, which encompasses a probabilistic risk assessment, or a PRA-
9 led approach, and the newly-developed Framework B, which enhances
10 traditional licensing approaches with risk insights used in a supportive
11 manner, as well as the technology-inclusive and performance-based
12 requirements.

13 The staff has continued to engage extensively with a diverse
14 set of stakeholders to enable robust dialogue, which has enhanced common
15 understanding of key issues in support of making informed changes to
16 preliminary proposed rule language to increase clarity, promote reliability, and
17 enhance efficiency. The staff has met with external stakeholders an
18 additional eight times since last December to enhance engagement on various
19 portions of the preliminary proposed rule and to receive stakeholder feedback
20 on key issues. The staff has also met with the ACRS, or Advisory Committee
21 on Reactor Safeguards, an additional five times, including focused meetings
22 on topics of particular interest to the Committee.

23 To enhance participation at public meetings, the staff has
24 released several iterations of the preliminary proposed rule text and advanced
25 copies of presentation materials to ensure that information about the NRC's

1 regulatory activities is readily accessible. We've publicly released two
2 iterations of draft rule language for Framework A and one iteration for
3 Framework B since December. This engagement has helped staff to identify
4 specific areas of stakeholder interest for enhanced discussion in the proposed
5 rulemaking package.

6 Although we may not agree with all stakeholder comments,
7 the staff has worked diligently to make changes in response to feedback
8 where reasonable and appropriate. In the staff's paper transmitting the
9 proposed rule to the Commission, we will raise key areas of stakeholder
10 interest for the Commission's awareness and consideration and will discuss
11 potential impacts of adopting viewpoints that differ from the staff's
12 recommendation. Early engagement on the preliminary rule language has
13 benefitted the development of the rule and should facilitate stakeholder form
14 of commenting on the proposed rule.

15 While staff's focus will now naturally turn to preparing the
16 proposed rulemaking package for transmittal to the Commission, this does not
17 mean we will end all engagement with external stakeholders. In fact, the staff
18 has scheduled another public meeting for next week to continue the dialogue
19 on the preliminary rule language. As with any rulemaking process, there will
20 continue to be opportunities for stakeholders' engagement before the
21 finalization of the rule.

22 Despite the enormous effort undertaken by the staff to get
23 us to where we are today, the staff is facing several challenges in completing
24 the Part 53 proposed rulemaking on the current schedule, as Darrell noted.
25 The *Federal Register* notice containing the proposed rule language and

1 statements of consideration is expected to be over 1,000 pages and is just
2 one of several documents that will make up the entire rulemaking package.
3 The staff is exploring innovative alternatives to our normal management
4 review processes to facilitate the review of this large and complex package.
5 In addition, there are some other issues that we are continuing to work
6 through, such as the exploration of additional rule provisions to address the
7 needs of microreactor designers whose reactors may be fully fabricated,
8 fueled, and assembled in a manufacturing facility before being shipped to the
9 ultimate operating site.

10 There are other areas for which we only recently reached
11 resolution and released preliminary proposed rule language, like Framework
12 B and the revised staffing sections of Framework A. These new proposals
13 were first discussed with the ACRS and external stakeholders in late June,
14 and additional feedback from these stakeholders may be forthcoming.
15 Nevertheless, I'm confident that staff will deliver a high-quality rule package
16 on schedule that achieves the goals outlined by NEIMA and the agency vision
17 for this rulemaking. Next slide, please. I'll now turn the presentation over to
18 Mo Shams.

19 MR. SHAMS: Good morning, Chairman and
20 Commissioners. It is my pleasure to be here today to share with you some
21 insights on the Part 53 rulemaking and the staff's efforts to develop this
22 modern risk-informed regulatory framework. In my remarks, I will highlight
23 the staff's transformative initiative to propose alternative licensing approaches
24 in Part 53 that meet the Commission policy of providing a level of safety
25 consistent with that of the existing regulations, while establishing efficient,

1 predictable pathways for licensing advanced reactor designs. I will contrast
2 the proposed approaches while highlighting the role they can play in licensing
3 future reactor design safely and securely. Next slide, please.

4 As I shared with you back in December, the development of
5 Part 53 has been carried forward through an incredible effort by an
6 extraordinary group of staff from around the agency who continue to double
7 their efforts to evolve the rule in a way that is innovative, responsive to
8 stakeholder feedback, and continues to meet Commission direction. As Rob
9 just mentioned, the team is also committed to developing the rule in a manner
10 that is consistent with the NRC's principles of good regulation. True to that
11 commitment and in response to stakeholder feedback, the staff undertook a
12 significant initiative and brought in Part 53 by adding a traditional licensing
13 framework to provide flexibility in the role of the PRA while continuing to
14 ensure predictability and safety focus of the requirements.

15 As Rob also indicated, the current construct of the draft rule
16 embodies two frameworks, A and B. Framework A maintains the PRA-led
17 approach consistent with the Commission policy to leverage PRA and
18 regulatory activities as supported by the current state of the art, while
19 Framework B offers a technology-inclusive traditional regulatory approach.

20 Specifically, Framework B is structured around compliance
21 with a set of performance-based and prescriptive requirements that defines
22 the design capabilities required to meet the safety criteria. Inversely,
23 Framework A enables the vendor to optimize the design by leveraging a
24 comprehensive design-specific assessment to develop a safety case and
25 demonstrate the viability of the design with a high degree of confidence

1 against the safety criteria.

2 While the two frameworks have different starting points, they
3 often meet at similar design endpoints, as they both leverage the same top
4 level safety criteria. One example of a top-level safety criterion that is met in
5 both approaches is the quantitative health objectives, or QHOs, from the
6 Commission's Safety Goal Policy Statement. They are included in the rule
7 language in Framework A to provide quantitative technology-inclusive
8 cumulative best metric that underpins risk-related requirements. Conversely,
9 the QHOs are used in guidance under Framework B to support the
10 deterministic requirements and defense-in-depth, consistent with the use of
11 the PRA in a supporting role. In aggregate, both frameworks provide an
12 equivalent level of safety that is as robust as provided with the current
13 licensing process in Parts 50 and 52 while leveraging, as appropriate, a
14 flexible risk-informed approach to meeting the requirements. Next slide,
15 please.

16 It is important to know that the current rule construct
17 presents Frameworks A and B as two distinct approaches. Although favored
18 by some stakeholders, as you heard this morning, addressing both
19 approaches in one set of rule language would have required writing the rule
20 at a very high level, likely lacking clear regulatory guideposts for future
21 applicants and potentially resulting in protracted review time lines, especially
22 for novel designs. Specifically, while providing an equivalent level of safety,
23 the two frameworks differ in the method used for establishing the licensing
24 basis for a design. Namely, one emphasizes risk metrics while the other
25 emphasizes design criteria.

1 Presenting them as two distinct frameworks in a proposed
2 rule provides applicants with options that appropriately balance flexibility and
3 predictability while also enabling effective and efficient licensing reviews. To
4 that end, an applicant will need to choose its preferred licensing approach at
5 the time of the application.

6 Although distinct, both frameworks share many common
7 requirements in areas like construction, operations, programs,
8 decommissioning, licensing maintenance, reporting, and quality assurance.
9 This commonality is responsive to stakeholder feedback on constructing
10 Framework A in a manner that leverages the innovative approaches
11 developed by the staff in Framework A to the maximum extent possible. So,
12 therefore, Framework B incorporates the flexibilities in Framework A wherever
13 possible, affording these approaches to applicants that can demonstrate
14 applicability with appropriate supporting analyses and programs.

15 Framework B also utilizes rule language from Parts 50 and
16 52 and, where necessary, the staff developed new language to address gaps
17 and consider pertinent concepts from international standards while adhering
18 to Commission policy. Principally, Framework B has been and continues to
19 benefit from robust stakeholder engagement and is encompassing diverse
20 views in establishing this alternative licensing approach. Additionally, in
21 optimally developing and integrating the two frameworks, the staff is working
22 tirelessly to meet the current schedule while continually assessing
23 opportunities to further improve the rule and enhance its flexibility. Next slide,
24 please.

25 Consistent with our vision to further enable flexibility in

1 licensing advanced reactors, the staff included in Part 53 a first-of-a-kind
2 alternative evaluation for risk insights that could serve as an optional
3 replacement for designs where the predicted consequences of potential
4 accidents are very small. The approach is transformative in its adjustment of
5 the method to provide risk insights for certain power reactors commensurate
6 with the facility's risk to public health and safety. If a designer is able to
7 demonstrate that under a bounding event that those at a distance of 100
8 meters from the plant is below certain dose guidelines, a PRA would have a
9 diminishing role in providing risk insights and identifying severe accident
10 vulnerabilities and would not be required. Qualitative risk insights into the
11 design and its severe accident vulnerability would be sufficient.

12 In closing, I would like to highlight that the approaches
13 encompassed in the Part 53 draft rule are equally viable in providing
14 reasonable assurance of adequate protection of public health and safety and
15 have benefitted from extensive stakeholder feedback. I'm immensely proud
16 of the contributions and commitment of the Part 53 team and very excited
17 about the remarkable product the team will deliver to the Commission. This
18 concludes my remarks. I will now turn the presentation over to Steve Lynch.

19 MR. LYNCH: Thank you, Mo. Good morning, Chairman
20 and Commissioners. Next slide, please. Since the Commission granted the
21 staff's requested extension to complete the Part 53 rulemaking last fall, the
22 staff has optimized the Framework A proposed rule text to clarify intent,
23 remove unnecessary requirements, close gaps, and ensure consistency of
24 requirements across a facility's life-cycle and the NRC's regulations. For
25 example, the staff has removed unnecessary requirements on the transition

1 from construction to operation, consolidated quality assurance requirements
2 in Subpart K, and added missing requirements on reporting of effluent
3 releases. The staff has also refined technical and licensing requirements to
4 reflect staff consideration of stakeholder feedback and employment of
5 innovative risk-informed approaches in new areas. For example, the staff
6 has refined its initial proposal to expand the activities that could be pursued
7 under a manufacturing license. The updated proposed rule text now
8 addresses factory-manufactured reactors that would be fueled prior to being
9 transported to a reactor site. This change reflects staff consideration of the
10 plans of some microreactor designers. In order to avoid duplication across
11 parts in 10 CFR, the most recent iteration of manufacturing license Part 53
12 proposed rule text relies, in part, on references to existing requirements in 10
13 CFR Part 70 to support fueling at manufacturing facilities.

14 Next slide, please. Consistent with the Part 53 rulemaking
15 plan, the staff is prioritizing and developing key guidance documents to
16 support the implementation of Part 53 and near-term applicants that may seek
17 licenses prior to issuance of the final rule, such as those in the advanced
18 reactor demonstration program sponsored by the Department of Energy.
19 The staff is engaging external stakeholders to inform its prioritization of
20 guidance development, leverage external expertise, and reduce duplication of
21 efforts to establish needed guidance. The staff is utilizing the expertise of
22 many external groups to develop guidance supporting advanced reactor
23 design and application preparation, including the Department of Energy's
24 National Laboratories, standards development organizations, nuclear
25 operating companies partnering with the Department of Energy, industry

1 organizations, and recognized experts.

2 The staff is thoughtfully considering guidance needs and is
3 tracking over 30 guidance documents that fall under four categories: existing
4 guidance to be updated for advanced reactor applicants, near-term guidance
5 to support early movers that will seek licenses prior to the completion of Part
6 53, guidance to be prepared specifically to support future Part 53 applicants,
7 and plant guidance that will be prepared separately from the Part 53 proposed
8 rulemaking.

9 Next slide, please. The staff's transformative thinking in
10 Part 53 has been carried through in the development of guidance. This is
11 best embodied by the efforts under the Technology-inclusive Content of
12 Application Project, or TCAP, and the Advanced Reactor Content of
13 Application Project, or ARCAP, which are cornerstones of Part 53 guidance.
14 Both efforts aim to streamline the development of license applications for
15 submission to the NRC by focusing on issues with the greatest potential to
16 affect facility safety and minimizing the documentation necessary for
17 nonsafety-significant information. This approach reflects the staff's
18 commitment to promote risk-informed decision-making to result in efficient
19 licensing activities.

20 The staff is also developing guidance to support its
21 innovative thinking in other key areas, such as fuel qualification, seismic
22 design, and facility staffing. As Rob alluded to, earlier this year the staff
23 published NUREG-2246, Fuel Qualification for Advanced Reactors. This
24 guidance recognizes that proposed advanced reactor technologies will use
25 fuel designs and operating environments that are significantly different from

1 light-water reactors for which existing fuel assessment guidance was
2 developed. As such, this report identifies criteria that will be useful for
3 advanced reactor designers through an assessment framework that would
4 support regulatory findings associated with nuclear fuel qualification. The
5 staff is engaged with the Department of Energy National Laboratories to
6 exercise and demonstrate the usefulness of this guidance for TRISO and
7 metal fuels.

8 The staff also plans to assess the need for additional
9 guidance in areas such as the classification of structures, systems, and
10 components; manufacturing licenses; treatment of chemical hazards; fire
11 protection; and facility maintenance, repair, and inspection. While these
12 potential future guidance documents are not considered key documents
13 necessary to accompany the proposed rule package, the staff will assess the
14 need for and possible development of additional guidance in parallel with Part
15 53 based on the availability of resources. Next slide, please.

16 The staff is committed to providing timely information on
17 guidance supporting Part 53 and other advanced reactor activities in support
18 of its goals for transparency and openness. For example, the staff is
19 designing communication tools, including enhancing our integrated schedule
20 for the NRC public web page. The integrated schedule is based on the six
21 core strategies described in the staff's nine light-water reactor implementation
22 action plans and showcases the staff's focus on key activities to ensure review
23 readiness for anticipated advanced reactor applications. External
24 stakeholders will find the integrated schedule beneficial in following the
25 progress of key guidance documents to support the design and license

1 application development, as well as the staff's planned interactions with the
2 public and Advisory Committee on Reactor Safeguards.

3 The staff's commitment to communication and consideration
4 of feedback on the Part 53 rulemaking process has also been demonstrated
5 through its hosting of public meetings with stakeholders, including non-
6 governmental organizations, industry groups, developers, and other members
7 of the public. As both Part 53 specific and more general advanced reactor
8 stakeholder meetings, the staff has considered feedback and led discussions
9 on the rulemaking process and key technical topics. This active engagement
10 fosters meaningful interactions with stakeholders as part of an effort to ensure
11 awareness and understanding of the NRC's rulemaking activities and provides
12 the NRC staff valuable insight on what is most important to stakeholders.
13 This promotes the development of a responsive, useful, and focused
14 rulemaking. Next slide, please. I'll now turn the presentation over to Lauren.

15 MS. NIST: Thank you, Steve. Good morning, Chairman
16 and Commissioners. I'm Lauren Nist, and I'm speaking today on the topic of
17 staffing flexibility in Part 53. I represent staff members from NRR and the
18 NRC's Office of Nuclear Regulatory Research who have been working on this
19 project for the last approximately two years. This team includes staff who
20 were previously licensed as senior reactor operators and qualified as shift
21 technical advisors at operating reactors, NRC-licensed operator examiners,
22 and staff who hold advanced degrees in human factors engineering. Next
23 slide please.

24 Part 53 proposes an innovative approach to staffing.
25 Instead of prescribing quantitative staffing requirements, which the staff did

1 not think would be technology inclusive, the staff proposes to establish
2 performance-based requirements that would rely on the results of human
3 factors engineering analyses and assessments performed by the applicants
4 to demonstrate that the proposed staffing for a facility is adequate to ensure
5 its safe operation.

6 The proposed performance-based requirements would also
7 provide flexibility by addressing the potential for operators at advanced
8 reactors to fill multiple roles, which is anticipated considering that there will
9 likely be fewer total on-site staff at facilities licensed under Part 53, as
10 compared to operating reactors. Additionally, in lieu of requiring that a
11 dedicated shift technical advisor be present on shift at plants licensed under
12 Part 53, the staff proposes that Part 53 applicants must describe how
13 engineering expertise will be available to the on-shift operating staff to assist
14 in the response to a situation not covered by procedures or training.
15 Engineering expertise includes both familiarity with the design and operation
16 of the plant and either a bachelor's degree in engineering, engineering
17 technology, or physical science, or a professional engineer's license. The
18 staff envisions this requirement could be met by a member of the on-shift
19 operating staff serving as a shift's technical advisor, like at operating reactors,
20 or by other means that are appropriate for the given facility. For example,
21 this requirement might be met by an on-call engineer who has access to
22 monitor key plant parameters and provide advice to the operating staff from
23 an off-site location. This approach provides flexibility to applicants while also
24 ensuring the engineering expertise will be available promptly to operating staff
25 when it is needed. Next slide, please.

1 Throughout the development of the proposed rule, the staff
2 has engaged extensively with internal and external stakeholders on this topic.
3 The staff has carefully considered and evaluated feedback from all
4 stakeholders and used it to refine the proposed requirements for operator
5 staffing and engineering expertise. For example, the first iteration of the
6 preliminary proposed rule included a set of requirements for facility
7 certification in lieu of NRC licensing of operators at facilities that could show
8 that certain criteria were met. The certified operator concept was a subject
9 of extensive discussions with internal and external stakeholders. We had
10 substantial diverse feedback to consider, including that we should not move
11 forward with the proposed approach.

12 After assessing all the feedback, the staff changed the
13 proposed requirement for facility certifications of operators in the second
14 iteration of the preliminary proposed rule. This iteration includes a new
15 category of licensed operators which are referred to as generally-licensed
16 reactor operators. The general license is provided in the rule, and the criteria
17 for facility licensees and generally-licensed reactor operators would also be
18 included in the rule. The primary difference between the general license
19 approach and the certified operator approach is that the NRC retains licensing
20 authority of power plant operators with the general license approach.

21 In conclusion, the staff expects that the proposed approach
22 to staffing requirements in Part 53 will adequately address a wide range of
23 advanced reactor technologies, including those that incorporate new and
24 innovative technologies that allow for at least some degree of remote or
25 autonomous safe operation. This will help ensure the long-term reliability of

1 the role. Next slide, please. I now turn the staff's presentation over to Tony.

2 MR. BOWERS: Thank you, Lauren. Good morning,
3 Chairman and Commissioners. Next slide, please. The staff is creating a
4 comprehensive and transformative security regulatory framework for
5 advanced reactors that applies a graded approach to the requirements for a
6 range of security areas, including physical and cybersecurity, fitness for duty,
7 and access authorization programs commensurate with the risk of public
8 health and safety and the common defense and security. Today, my
9 presentation will focus on two of these areas: fitness for duty and access
10 authorization.

11 At our last Commission meeting in December, we presented
12 to you the staff's proposed approach to physical and cybersecurity. Because
13 of the variety of potential reactor designs, radiological consequences provide
14 the benchmark underlying our graded approach, considering the impact of
15 potential safety and security events at a facility. The staff's proposed
16 technology-inclusive performance-based regulatory framework provides
17 flexibility for the licensing of advanced reactors while ensuring individuals
18 working at nuclear power plants are trustworthy and reliable and fit for duty.

19 The staff is leveraging its experience with fitness for duty
20 and access authorization programs at operating reactors on power production
21 and utilization facilities and certain material licensees to develop Part 53
22 framework. The staff is benefitting from expertise within and outside the NRC
23 in this development. Early stakeholder engagement has been useful in
24 providing a greater understanding of diverse public views, industry
25 considerations, and other inputs, and help guide the development of these

1 new regulatory approaches and implementing guidance. Next slide, please.

2 The fitness for duty framework proposed by staff is
3 developed to cover the range of activities from construction to operations and
4 is consistent with the programs in place now at Vogtle Units 3 and 4 and
5 throughout the operating fleet, including standards for nonpower production
6 and utilization facilities. This framework replaces some prescriptive
7 requirements with options for licensees to use new technologies, such as oral
8 fluid and hair testing and passive screening portal monitoring.

9 The staff is also proposing to apply fitness-for-duty
10 programs to manufacturing licensees who assemble and/or fuel manufactured
11 reactors, which is equivalent to the assembly and fueling of new power
12 reactors licensed under Parts 50 and 52 today.

13 For applicants that can demonstrate by design that
14 consequences resulting from a bounding security-initiated event do not
15 endanger public health and safety or the environment, the fitness-for-duty
16 program requirements will be scaled commiserate with the reduced risk to
17 public health and safety. For example, for a subset of licensees who have
18 low-risk facilities that meet proposed consequence-oriented criterion may
19 have very limited numbers of staff on-site and/or were designed and licensed
20 in a manner that minimizes reliance on human actions to maintain safety and
21 security, the fitness-for-duty program would not require drug and alcohol
22 testing and would instead rely on comprehensive provision for behavioral
23 observation, performance monitoring, and the self-disclosure of legal actions
24 by plant workers.

25 A similar graded approach is proposed for access

1 authorization programs. For the larger advanced reactors that could pose
2 similar risks to operating reactors, licensees would implement the same
3 access authorization program as an operating power reactor. Licensees that
4 demonstrate by design that they meet the proposed consequence-oriented
5 criterion would implement an access authorization program that has been
6 informed by the programs at nonpower production and utilization facilities and
7 certain material licensees.

8 For this subset of licensees, this proposed framework would
9 maintain key elements of the existing trustworthy and reliability requirements
10 in the access authorization programs for individuals requesting unescorted
11 access. For example, individuals would be subject to a background
12 investigation that includes a criminal history, employment, and credit history
13 check, and true identity verification. They would also be subject to behavioral
14 observation once granted unescorted access. Next slide, please. This
15 concludes my prepared remarks. I'll now turn the presentation back over to
16 Darrell Roberts.

17 MR. ROBERTS: Thank you, Tony. And in conclusion, I
18 want to again thank all the staff who have continued to demonstrate NRC's
19 commitment to supporting the advanced reactor program and this enormous
20 rulemaking effort, as well as the many stakeholders who participated in the
21 process to date. The staff is committed to openness, transparency, and
22 clarity in the development of a technology-inclusive Part 53 rulemaking on a
23 Commission-approved schedule and within the framework of the
24 Commission's Advanced Reactor Policy Statement. The agency's priority
25 and focus remain on the safe and secure licensing of advanced reactors to

1 support our national energy needs. This concludes the staff's presentation,
2 and we look forward to answering your questions. Thank you.

3 CHAIRMAN HANSON: Thank you, Darrell. We'll start
4 again with questions with Commissioner Baran.

5 COMMISSIONER BARAN: Well, I want to start by
6 thanking all of you and the rest of the Part 53 team for your tremendous work
7 on this critical rule. I've been very impressed not only with your expertise but
8 with your collective focus on safety and your ongoing efforts to balance a large
9 number of complex and often competing stakeholder suggestions and views.

10 On the first panel, we talked about an overarching
11 performance standard and the pros and cons of using the quantitative health
12 objectives as that standard. I want to ask you some of the same questions I
13 asked our external panelists on this topic and get your thoughts. I'm hoping
14 we're going to cover a lot more topics than just that one, but maybe we start
15 with that one. First, you know, does the staff think that a performance-based
16 regulation requires an overall safety standard or criterion in the regulation?
17 Second, what's the staff's current thinking on using the QHOs as that
18 standard? And, third, if you don't use the QHOs, what's the alternative?
19 Just that, just cover that.

20 MR. TAYLOR: Just that. The first one was a yes/no,
21 Commissioner. So, first, yes, we do believe there needs to be a standard in
22 the regulations, which is why we've engaged with the stakeholders, but we've
23 held that we still think the QHOs need to be in Framework A. And part of the
24 rationale for that is that we've changed the entire structure of how you go about
25 licensing under Framework A to this more performance-based requirements

1 where you don't have individual regulations that impose defense-in-depth and
2 other requirements throughout. So we've heard the concern that the
3 perception is this is more burdensome. Look at the rule in its totality and look
4 at all the regulations that don't exist in Part 53. And when you see all the
5 regulations that have been taken out, whether they be for cladding
6 performance or containment performance or things like that, what you see is
7 you need an overarching measuring stick to determine whether the facility is
8 safe. And the QHOs have served the agency, the public, and the industry
9 very well for 40 years. And if we're going to have a standard that they're
10 going to be as safe, this is the standard for them being as safe as the current
11 generation of plants.

12 So we don't see, we've asked this question about
13 alternatives, and we haven't seen a proposal yet, but we're more than open.
14 But we also recognize if you want to build something different than the QHOs,
15 that might be a substantial effort in and among itself and it might be a broader
16 policy question for the Commission. So I didn't know if Mo wanted to add
17 anything to that.

18 MR. SHAMS: If I can just jump in there. So as Rob
19 indicated, we see it as crucial for Framework A because it does play a critical
20 role in demonstrating what is the measuring stick for safety of a design.
21 When is safe, safe enough, and we have to be able to structure a number of
22 metrics to be able to arrive to that answer. It is not in Framework B because
23 we have the structure in there that actually relies on the current traditional
24 framework of establishing the answer to that. It does play a supporting role
25 in confirming that that design indeed is meeting the safety goal for the mission.

1 COMMISSIONER BARAN: Thanks. Another issue we've
2 heard a lot about is whether to incorporate the concept of ALARA, or as low
3 as reasonably achievable radiation doses, as a design principle. Can you
4 talk about what you see the rule doing in this area and why the staff thinks
5 that's the right approach?

6 MR. TAYLOR: Sure. So ALARA is another principle that
7 has served the public very well for the last 50 years plus. It goes back to the
8 nuclear Navy days and the concepts. So one of the pieces we've heard,
9 because ALARA exists in the regulations as of today and is a design
10 requirement today and is considered as we do licensing under Part 50,
11 Appendix I, Part 20, and other aspects, is balancing design with operational
12 programs. And so we've taken to heart the feedback that we've gotten from
13 stakeholders to say we recognize that, as you design the facility, the walls will
14 exist and you will determine what zones you want for radiation protection on
15 each side of that wall. Whether you decide to have a one-foot wall made out
16 of lead or a one-foot wall made out of concrete or a three-foot wall made out
17 of concrete, or however you choose to do it, you pick what you want with the
18 design and then explain how the operational program will help achieve the
19 ALARA goal. So you get the flexibility to balance those two pieces within the
20 regulatory framework.

21 So we're not elevating ALARA and saying we're going to
22 dictate to you how the facility shall be designed to achieve ALARA. We're
23 saying combine those pieces which you asked us to do in prior reviews and
24 take credit for the operational program, as well as the design aspects you're
25 already going to put into the facility.

1 MR. SHAMS: If I may just add to Rob's point also. The
2 concern, as you heard earlier today, potentially is how much am I going to
3 submit to the NRC to review about ALARA and the design features and
4 whatnot. We actually took that head-on in the guidance development.
5 We're offering there a performance-based approach that's focused on the
6 programmatic. In fact, clearly is saying design objectives or design details
7 should actually be just done by the designer, the vendor, kept on-site, and we
8 would audit when we need to. So we're trying to get to the point.

9 And Rob's point about the combination, we actually
10 changed the rule to include that phrase in there, combination of design
11 features and programmatic control to truly put our cards on the table. We're
12 not looking for you to change the design; we're looking to create the
13 opportunity for you to consider ALARA in the design.

14 COMMISSIONER BARAN: Okay. The facility safety
15 program is another issue we heard about this morning. Can you talk about
16 what you see the rule doing in that area and why the staff thinks that's the right
17 approach?

18 MR. SHAMS: The facility safety program is a proposal by
19 the staff to, if you would, potentially empower licensees to manage the risk for
20 a facility over the life cycle of the facility in a potentially more efficient way. In
21 a sense, as we heard today this morning from Mr. True that there's potentially
22 300 new applications now, so we're thinking ahead in that regard, looking back
23 at what we've done in Fukushima and what have you when we realized
24 changes or potential risks and we had to do all sorts of activities to go and
25 assess that. So we're looking for a way to potentially approach that in a way

1 that could be more efficient, more effective, and it could actually inform our
2 imposition of safety requirements in the future or what have you.

3 So it's a proposal. It's intended to, again, offer that
4 opportunity. It is modeled after programs that we already have in Part 70. It
5 is modeled after programs in other federal departments, as well. So it's a
6 proposal from the staff.

7 MR. TAYLOR: And one of the things it will do is it gives
8 that licensee the flexibility to evaluate that and assess whether changes are
9 needed to that facility. It does not impose, necessarily, unless the risk
10 threshold would be sufficient to say you need to come back and reassess this.
11 They do this already in the corrective action programs and other programs at
12 the plants today. They look at new information and assess whether they
13 need to take a different approach to that.

14 So we're saying the facility safety program is a more
15 effective way to do this than our existing GSI program and other things that try
16 to take these things on generically, which might be very site- or facility-specific.

17 COMMISSIONER BARAN: Okay. We heard some
18 concerns that the Part 53 framework wasn't going to work well for
19 microreactors. What's the staff's view on that? Are there adjustments you're
20 considering for microreactors specifically, and how do you envision the rule
21 addressing manufacturing licenses?

22 MR. TAYLOR: I'll start this time, and Mo can jump in. So
23 we recognize and we mentioned this in our, there might be other things we
24 want to do for microreactors. But Framework B in particular and the area
25 approach says microreactors might be the easiest to demonstrate they meet

1 the area approach. And if you do, you get substantial flexibility in how you
2 design your facility and the capabilities that you need to demonstrate for that
3 facility.

4 So the frameworks between them are meant to be a
5 spectrum, not a binary one or the other. And so a microreactor can find its
6 way into those, and, once you demonstrate the safety case, it dictates what
7 you have to provide to the NRC. So a microreactor that can demonstrate that
8 enhanced safety may not need certain operational programs and we'll say
9 meet the intent of those to the agency. We'll say I demonstrate the dose
10 consequences 100 meters; therefore, there's my bounding event and that's all
11 I need to do relative to that. And so a lot of Framework B and Framework A,
12 to that extent, can accommodate microreactors, but we're open to some
13 additional changes, recognizing that there may be unique needs for
14 microreactors.

15 MR. SHAMS: I will add to Rob actually. I'm a glass half-
16 full person, and I believe we actually went a fair amount to try to address as
17 much as possible, you know, the needs for microreactors. As Rob indicated,
18 area is one approach. We're looking at manufacturing license to indicate
19 that. We're moving the requirements or at least adjusting the requirements
20 to be able to enable fuel loading at the facility itself, and we're currently looking
21 at an opportunity for could we allow criticality testing at the facility itself, as
22 well.

23 So there are a number of things: EP; you heard from Tony
24 about access authorization; fitness review. All these programs are graded in
25 a way to enable such facilities that are inherently safe to have a graded

1 approach for all these programs. So we're on our way. Rob's point is well
2 taken. We're going to learn more. We're going to figure out are there other
3 opportunities to perhaps augment as we go forward.

4 COMMISSIONER BARAN: Let me close with more of a
5 process question. With this rule, we've talked about this a lot, the staff is
6 navigating an intensive public engagement process that has really well
7 beyond anything the agency has ever done on a rulemaking before. And so
8 I'm interested in hearing the staff's perspective, I guess, a little bit more briefly
9 on this part and how that's been going so far, but then maybe, more
10 importantly, you know, the staff's vision for how the process will unfold in the
11 coming months as the staff crafts the draft proposed rule.

12 MR. TAYLOR: A very analogous question to this got
13 asked, I think by Commissioner Caputo, last year. And I said it was too early
14 to tell at that point. So we have another year of runtime under our belt. This
15 has been hard; it has. And I'm sympathetic to stakeholders trying to keep up
16 with us. When we put the plan together to do the rule originally and we gave
17 the Commission the 30-day paper and we said here are the challenges we're
18 going to face, we faced all of those challenges, whether it's providing enough
19 meaningful opportunities, getting information out to the stakeholders in a
20 timely fashion, we recognize those are challenges; they're challenges for the
21 staff, as well as we tried to finalize and put the best product we can out. And
22 it's a moving target as we go, as we continue to refine and take that feedback.

23 So I think the preliminary release of rule language is a good
24 thing. I think probably I'd have milestones for when we're going to release it
25 the next time we do it and say we're going to give you the best we have on

1 day X and here's the meeting we're going to have. We were really dynamic
2 in this approach so far, and that creates some uncertainty for us, it creates
3 some uncertainty for stakeholders. I'd probably have some milestones we
4 target very explicitly and say we're going to put these out, so people would
5 know when those opportunities to engage on that preliminary language would
6 be. But, honestly, I don't think we failed in what we've done. I think it's just
7 a way to continue to improve.

8 COMMISSIONER BARAN: Okay. Well, go ahead.

9 MR. SHAMS: The only item I was going to say is we
10 wouldn't be here today talking framework if we weren't out there talking to
11 stakeholders and getting their feedback. So it did immensely improve where
12 we are.

13 COMMISSIONER BARAN: Well, you know, my
14 impression, too, is that the high level of interaction has only increased
15 stakeholder expectations about how quickly they're going to hear feedback on
16 concepts, you know, and how involved we'd be in resolving tough issues.
17 And, you know, I think everyone recognizes, in the end, the agency ultimately
18 needs to make the decisions and write the draft proposed rule. And, of
19 course, the proposed rule would go out for public comment just like any other
20 rule. This is all well before we get to, normally, the first time we're asking for
21 public comment, which is the proposed rule. So I appreciate all that you all
22 are doing. I know it's a lot for everyone, for you and for stakeholders trying
23 to engage in this. It's a new process, so we're just trying to work through it
24 together. But thank you for all of your work. Thanks.

25 CHAIRMAN HANSON: Thank you, Commissioner Baran.

1 I think you threw down the gauntlet in terms of number of questions on topics
2 in a ten-minute period.

3 COMMISSIONER BARAN: Five, five. See if you can beat
4 five.

5 (Laughter.)

6 CHAIRMAN HANSON: Commissioner Wright, I think it's
7 over to you.

8 COMMISSIONER WRIGHT: I don't think I'm going to hit
9 five. But, you know, first, to be very serious, I want to commend you on what
10 you're doing and how you're going about it. There's not a moment or a time
11 that I reach out to Robert or Mo, Andrea, or anybody that I don't get a quick
12 response. They do their best to give you the best information they've got,
13 and I appreciate the engagement that you have and the conversations, you
14 know. When we're trying to probe, you know, what are you hearing, here's
15 what we're hearing, try to compare notes, and then how you're saying, well, if
16 we would hear something more specific, we'll engage. So I hope that you're
17 going to get more of that. So thank you for what you're doing. I can tell
18 you're passionate about it, and it's very confusing, parts of it.

19 So I wanted to ask you, I want to go a question that has
20 been raised here today. I've heard it for months, and you've all have heard
21 it, as well, that stakeholders throw out about possibly you're targeting the level
22 of safety that is higher than the reasonable assurance of adequate protection
23 standard, which is our mandate through the Atomic Energy Act. It's our strike
24 zone over home plate.

25 I've heard in presentations outside of this room that staff has

1 done, I've the word enhance safety, I've heard the word ensure safety. And,
2 Mo, I even heard you today say when is safe, safe enough, right? I'd kind of
3 like to ask you what do you mean when you say that? Because that, to me,
4 indicates it might be, that it might be a higher standard. But if it's not, can you
5 address that in the terms of Part 53?

6 MR. SHAMS: Sure, yes. So in terms of what safe is safe
7 enough, that's just a question the Commission actually had answered decades
8 ago, and it was actually after TMI where a quantitative objective metric was
9 developed to identify below that it's residual risk that, you know, it can be
10 acceptable to us. And we're at the same level. So going back to the point
11 about Part 53, I would unequivocally say that we are not targeting a level of
12 safety that's beyond what we're doing today. The perception of doing that is
13 coming from the change in the paradigm of how we're actually establishing
14 the safety case for a design, particularly around Framework A. It is built
15 around performance metrics, safety criteria, and comes with that requirements
16 for programs, requirements for design requirements, ALARA, as you heard
17 today, or a QHOs in the rules.

18 So those are the perceptions of you're targeting a higher
19 safety standard that wasn't there before. That's not true. It is just a product
20 of how that framework is being put together, not necessarily an elevation of
21 the standard.

22 COMMISSIONER WRIGHT: Okay. And I guess you will
23 continue to engage with the stakeholders on that very question and, if they
24 have specifics, you'll address those, right?

25 MR. SHAMS: Indeed.

1 COMMISSIONER WRIGHT: Okay, very good. I don't
2 want to go back and re-plow ground, but I want to go back, I do want to go
3 back and just get some maybe a little clarification or maybe talk a little bit
4 because Commissioner Baran did bring it up. So in the first panel, you know,
5 and in the recent releases of the draft rule language, stakeholders have
6 provided feedback that the rule seems cumbersome, right? Burdensome, I
7 think, is a word they said, as well. And they say that many of the
8 requirements should be high level, and much of the detail should be in
9 guidance.

10 We had a conversation a week or so ago about kind of that,
11 right? And you explained to me how, when things are in guidance, there has
12 to be something, you know, to point to. Could you kind of talk about your
13 perspective on that and what that means?

14 MR. TAYLOR: Yes. So we don't see it as binary:
15 regulations or guidance. We see it as a combination: what's the best way to
16 put the pieces of the puzzle together to have the right regulatory footprint at
17 the end of the day. So if we write guidance for something, it should be
18 pointing to a regulation, right? Otherwise, we're imposing requirements via
19 guidance. So we need to have the right level of regulation within Part 53 that
20 we think is necessary to demonstrate, keeping it as performance-based as
21 possible and then using the guidance as one method to achieve it.

22 So we recognize that anything we put in guidance, there can
23 be alternatives proposed, too. And we are very open and reflective, so we're
24 giving the best we can in guidance today, recognizing we're going to learn
25 that. So we're trying to keep those regulations at the highest level we think

1 is appropriate, but, at the same time, we have to have enough in there for
2 clarity as to what the standard is to meet. How will we judge acceptability
3 because one rightful criticism that we get when we do the reviews is we don't
4 know what the staff wants. We don't know what is acceptable to the staff.
5 So there has to be enough detail in the regulation that we can say that meets
6 the regulation, and then here's the guidance for the methodology for how to
7 demonstrate that meets the regulations.

8 So it's a balancing act. And so I don't think you can just
9 take things out of the regulation and put them in guidance because what's the
10 guidance pointing to? The guidance shouldn't establish a requirement that
11 isn't in the regulations or shouldn't point to any type of requirement that isn't
12 in the regulations.

13 MR. SHAMS: If I just may add to that. You know, I love
14 everything that Rob said, but I also want to give examples of where we actually
15 took requirements out and put them in guidance --

16 COMMISSIONER WRIGHT: That's where I was going.

17 MR. SHAMS: -- based on feedback. Yes, we did that.
18 We just talked a couple of weeks ago about fire protection, too detailed, could
19 you give us some relief in there, and that was a good comment and we're
20 actually working with our counterparts in NRR on that area.

21 Also, the frequencies of the initiating events, that was one
22 of the things that we had in Framework A early on, here's the different
23 frequencies for the initiating events. Well, that came out also because, to
24 some, it was too restrictive, so now we actually qualitatively describe that and
25 we rely on guidance to be able to identify it. So it's a two-way street, and

1 we're looking for these opportunities.

2 COMMISSIONER WRIGHT: Good, that's good. And to
3 follow-up a little bit more on this, and we heard this by everybody on that first
4 panel, right, about, although we've been challenged, we've got what we think
5 is a lot of time, it looks like it's really getting compressed, right? And they
6 would like more dialogue and more opportunities, and I think we all would think
7 that's a good thing, right?

8 And I know that we've heard, I've heard, you've all heard,
9 too, from outside groups, some of them were here today, some were in the
10 room maybe or listening online, but what are your plans to address some of
11 these requests that they're speaking to that are out there and how could it be
12 valuable to us, and what's the right way to do it, okay? Because there have
13 been some suggestions that, you know, it needs to be more formalized, right?
14 So could you speak to that a minute?

15 MR. TAYLOR: So we indicated how many public
16 engagements we've had since December, and we're willing to continue to
17 have those. We've already scheduled the next one, recognizing for the very
18 reasons that folks -- we got Framework B out in June and then we had a couple
19 of meetings, so we recognize that stakeholders are still formulating their
20 feedback to us. So we're going to have another public meeting on that. The
21 comment period for the preliminary proposed rule is open to the end of August,
22 and we're more than willing to get input.

23 If there's specific topics that stakeholders want to talk to us
24 about, we're willing to engage on those. Tell us what those are, and we'll put
25 specific agendas, times, in our public meetings to discuss and have dialogue

1 around those topics so that we can make sure all stakeholders are involved in
2 those dialogues and giving us their perspectives. And that's part of our
3 commitment to openness and transparency, especially as we build a rule that
4 affects the nation as a whole as we license these reactors and the societies
5 where these reactors will be located.

6 So that's how we're planning to continue to proceed: give
7 opportunities, have that engagement, and recognize that there's going to be,
8 as Commissioner Baran put it, opportunities at the public comment period,
9 there's going to be meetings during the public comment period, there's going
10 to be other opportunities to continue to engage throughout. This is not the
11 end of the engagement process.

12 COMMISSIONER WRIGHT: Yeah, I do know that they've
13 spoken to possible, other opportunities to have joint meetings outside, but they
14 have to be done a certain way so all sides are represented, right?

15 MR. SHAMS: For a rulemaking, it has to be done in an
16 open and transparent way. All stakeholders have opportunities to voice their
17 views.

18 COMMISSIONER WRIGHT: Right. Thank you so much
19 for that. One last thing, while I've got 48 seconds because I think you can
20 answer this question pretty quick. So NEIMA directed us, and we heard it in
21 the first panel, to develop a risk-informed and performance-based regulatory
22 framework. We heard a little bit about the two concepts in the first panel.
23 So how does the current draft achieve that goal for that?

24 MR. TAYLOR: I'll start. Three things. As we built
25 Framework B, which is where we're hearing some concerns about

1 performance-based, as we built Framework B, we started with the construct
2 that we're going to take as much as we can from Framework A, which was
3 clearly intended to be performance-based, and take it forth, recognizing there
4 might be some limitations because you don't have the same tools in
5 Framework B that you have in Framework A. Then we said what else in the
6 regulations is already performance-based that we want to pull forward from
7 Part 50 and 52? And then, lastly, as we need to build the other pieces that
8 go into Framework B, how can we make those as performance-based as
9 possible?

10 So I think it's, again, not a binary, it's not an either/or
11 situation. And if there are specific pieces that stakeholders want to engage
12 on about whether they can be more performance-based, we're happy to have
13 that dialogue. And fire protection is a great example of one where we heard
14 that feedback, we're taking it back, we're going to look at changing the rule on
15 that, and we're having more dialogue with them. So from that perspective,
16 we think we're meeting the NEIMA expectations for technology-inclusive and
17 performance-based regulation.

18 MR. SHAMS: If you indulge me just for ten seconds
19 because I'm itching to cover this one. So I heard this morning something
20 about the rule is not risk-informed, and I would argue that it is in the right areas,
21 particularly for Framework A. We have very risk-informed seismic
22 requirements that are either already out or on their way out to be shared with
23 the public as well. The entire framework in Framework A is built around
24 selection of structure, systems, or components that are risk informed, whether
25 they contribute, in a way they contribute to risk, their qualifications, their

1 requirements, and what have you.

2 As far as Framework B, as Rob indicated, we are continually
3 looking for opportunities to continue. Fire protection is one side, seismic is
4 another one. You heard Lauren talking about staffing, as well. So I will say
5 we're targeting as many areas as possible to get to that level of performance
6 based.

7 COMMISSIONER WRIGHT: Mr. Chairman, I only got four
8 questions in. I'll turn it back over.

9 CHAIRMAN HANSON: Still impressive, frankly. I'm not
10 sure I'm going to get there. Thank you for your presentations this morning.
11 I think a lot of really good work has happened. I'll have some positive, a lot
12 of positive things to say in the wrap-up, but I want to dive into the questions
13 here if I can.

14 I'm interested in this idea about the Framework A,
15 Framework B, and what the level of separation is between the two and the
16 robustness, or not, of what I want to call the permeability between A and B.
17 And as Dennis Henneke was talking this morning, you know, he was talking
18 about including a PRA-forward approach in Framework A, kind of having more
19 permeability.

20 But what I didn't understand, and I didn't get a chance to ask
21 him so I'm just going to ask you guys, was, you know, kind of what's the
22 difference between having a PRA-forward approach in Framework A or just
23 bringing some deterministic approaches into Framework A or bringing some
24 PRA-based approaches into Framework B because it seems to me, and
25 maybe I'm not quite thinking about this, I do kind of think about the applications

1 that we're going to get along the bell curve, right, where there are going to be
2 very few folks out there who have the level of information that's needed to do
3 a pure PRA/LMP type approach, and we're going to have probably mostly,
4 let's face it, micros on the other end of the spectrum that are going to be purely
5 deterministic, right? It doesn't matter what's inside if you build a big enough
6 shell around it. Everybody else is going to be in the middle somewhere on a
7 spectrum between pure PRA and pure defense-in-depth deterministic
8 approach.

9 So what is that permeability and what is the, at the risk of
10 increasing complexity, which I'll talk about next, what's the optionality in there
11 for applicants and potential licensees?

12 MR. SHAMS: Thanks, Chairman. This is a great question
13 for us. So we absolutely approached this problem when we were presented
14 with it over last year. PRA is too complex, it doesn't fit us, you know, some
15 of the vendors indicate I don't have the information per se or just, you know,
16 my design is safe enough. And, hence, we've developed the three options,
17 we've listened and developed the three options. We have the opportunity, if
18 you're able to develop the PRA, if you're invested in developing the PRA, you
19 have Framework A that offers you the flexibility to optimize your design to
20 choose what systems that need to deliver the ability to meet these safety
21 criteria.

22 Framework B spills back to, if you want to use that PRA in a
23 confirmatory aspect to provide some insights into perhaps your selections of
24 structure systems or components or your ISI, ISDs, or what have you, you can
25 do that. But in doing that, you have to meet principal design criteria. We

1 have to define what goes into the design to actually arise to the safety level
2 that we need. And then we have the third option that says, well, if your design
3 is that safe and we can take a bounding event and you can show that your off-
4 site consequences are very limited, perhaps a PRA is not for you.

5 Now, I won't present this as we only have three options.
6 NRC regulations have always been flexible and they have opportunities to
7 look for alternatives. So someone that wants to fit in between, do something
8 and present issues differently, they still have the ability to do that, and we have
9 the ability to accept it, as well. But we're trying to balance what you've heard
10 earlier today about enforceability, about inspectability, about public trust on
11 what we're putting out there. So all these things are being balanced together,
12 in providing a clear set requirements on these three different tracks, if you
13 would, that folks can follow and get licensed in an efficient manner.

14 CHAIRMAN HANSON: Okay. Yes, thank you. That's
15 very, very, that's very, very helpful. A thousand pages. And I think I've stole,
16 maybe it was Andrea's presentation, I've been giving Andrea's presentation a
17 couple of places out there in the world, so I appreciate that. Maybe it was
18 yours first, Rob; I don't know. But there's a slide in this presentation, and it
19 lists all of the guidance documents. There are a lot of guidance documents,
20 and we have a rule now with these three, roughly speaking, approaches.

21 So one of the things we've heard then is about the
22 complexity, potentially, of the rule and that we have something that is maybe
23 actually or maybe it's just perceived to be more complex than, say, Part 50
24 and 52. And I think you guys responded to some of those comments about
25 Framework A in particular, and Steve mentioned the optimization of

1 Framework A. So is there going to be a commensurate effort around
2 Framework B in terms of optimization and in terms of, I guess what I want to
3 call editing on that process maybe? Can you talk a little bit about how that's
4 going to work?

5 MR. SHAMS: It is actually going on as we speak, the
6 optimization efforts, the integration between the two frameworks, opportunities
7 to reference more. When we structured Framework B, obviously, you know,
8 as we all know, it happened a year after Framework A was already underway.
9 So it was prudent for us not to impact what was already done and also to be
10 careful not to impact 50 and 52 because that has implications to current
11 licensees, as well. So that's why we structured Framework B as it is,
12 standalone.

13 Surgically, however, you know, referencing back to Part 50
14 or 52 where we needed to and we found these areas as opportunities. So
15 we're in the process now of looking more at are there other opportunities to, if
16 you would, deconflict or reduce the burden but maybe leave a metric out and
17 say -- we actually just did a word count on what Framework A and B do versus
18 Part 50 and 52. And so to all of our surprise, they're half the size of the
19 regulation they replace in Part 50, 52, 55, and Part 100. So it's just an
20 objective metric of, you know, we've cut the wording down by half.

21 CHAIRMAN HANSON: From a 30,000-foot level, people
22 are going to look at that and say okay. Alright, that's very helpful.

23 Can you just kind of give us a highlight on the optimization
24 effort for Framework B about kind of where you're focusing?

25 MR. SHAMS: Sure. I think I shared a little bit of that

1 earlier, but we're focusing in areas where we can actually do more
2 performance-based than we currently have, and it's going to be in siting,
3 seismic, fire protection I believe, and just continuing to optimize the staffing
4 piece that Lauren was talking about earlier. This is where our focus is.

5 CHAIRMAN HANSON: Okay, great. Thank you. Yes, I
6 really, I want to encourage, you know, I'm not focused on the burden piece so
7 much. The complexity, I think, concerns me a little bit from a public credibility
8 and a public communication piece. We want to have something out there
9 that's understandable that most people can look at, at least at a high level,
10 and say, yep, NRC is doing what they're supposed to do, they're doing their
11 confirmatory analysis. So I really appreciate that.

12 In terms of the content of applications where we've got the
13 technology-inclusive piece of that, the advanced reactor piece of that, of
14 course that's intimately related to the LMP and Framework A and so forth.
15 But are you doing additional things, I think, in terms of Framework B to provide
16 guidance for applicants in this area?

17 MR. LYNCH: Yes, we do have several efforts underway to
18 ensure that we have appropriate guidance in place for Framework B. One of
19 those efforts, you talked about the TCAP and ARCAP efforts, we are planning
20 a volume two of ARCAP that will specifically address Framework B. So as
21 we do that, we're looking at where the existing aspects of the volume one of
22 ARCAP that's currently underdeveloped that can be utilized under Framework
23 B, other aspects of the current standard review plan for current operating
24 power reactors in NUREG-0800 that can be used, and also is there some
25 unique augmentation that's necessary so that we can specifically address the

1 differences in the licensing frameworks.

2 For example, one of those areas is looking at environmental
3 qualification for electrical equipment. We've also drafted two documents
4 specifically for the area approach, one for identifying initiating events and one
5 for the overall approach to entering into area and taking advantage of that.

6 We also have a number of guidance documents that have
7 been developed for early movers that will support both those that are getting
8 licensed under 50.52, looking at Framework A and even Framework B. For
9 example, I had mentioned earlier that we did publish fuel qualification
10 guidance earlier this year and are continuing to work with the national labs on
11 ensuring that it is appropriate for various fuel forms that can be utilized under
12 the various frameworks.

13 CHAIRMAN HANSON: Thank you. I appreciate that.
14 And I guess I'll just wrap here, at least for my own time, just to thank the staff
15 and to appreciate the complexity of the task in front of you, both substantively
16 and process-wise. I was out at Idaho National Lab last week, and I was
17 invited to give a talk and I said, you know, to kind of Commissioner Baran's
18 point, we've taken a lot of feedback from outside parties substantively up-front
19 before we even get to the proposed rule stage. There's been a lot of benefit
20 to that, I think, as you guys have articulated about improving the quality of that.
21 I think one of the potential drawbacks is, occasionally, everybody freaks out
22 about where we are at any given moment, and I got some help from John
23 Wagner, who is the Director out at Idaho National Lab, who also encouraged
24 everyone to not freak out quite so much but that it is a work in progress and
25 that the work that's gone into this is substantial. And it will continue to be a

1 work in progress through the proposed rule and the final rule and, I dare say,
2 based on the things that we're going to learn over time, even thereafter. And
3 so there will be lots of opportunities.

4 As we wrap up, I'll ask my colleagues if they've got any
5 closing remarks they'd like to make. Okay. Well, with that, again, I
6 appreciate all of the external panel. I think we had a very good discussion.
7 These key issues around things like performance objectives, performance
8 standards, and a performance-based rule, the role of risk information, the role
9 of new concepts like the facility safety plan and other things, are exactly the
10 hard conversations that we should be having. To at least paraphrase former
11 Commissioner McGaffigan, rest his soul, I think there's some real learning
12 that's been going on here.

13 I'll also close with, I've been using a quote lately by Leonard
14 Bernstein who said that to achieve great things two things are needed: a plan
15 and not quite enough time, which, given the constraints that we find ourselves
16 under, I think actually gives me a lot of hope. So I'd emphasize, I'll close with
17 this one last thing. A friend of mine has stopped saying good luck to people
18 since luck, actually, very seldom kind of plays a role in the circumstances we
19 find ourselves in. Rather, she tells people you have what it takes, which I
20 think is actually very apropos of the NRC staff and these circumstances, as
21 well.

22 So with that, we're adjourned.

23 (Whereupon, the above-entitled matter went off the record
24 at 12:03 p.m.)

25