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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

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FUTURE PLANT DESIGNS

SUBCOMMITTEE

+ + + + +

THURSDAY

SEPTEMBER 23, 2021

+ + + + +

The Subcommittee met via Teleconference,
at 9:30 a.m. EDT, David Petti, Chair, presiding.

COMMITTEE MEMBERS:

- DAVID A. PETTI, Chair
- VICKI M. BIER, Member
- RONALD G. BALLINGER, Member
- CHARLES H. BROWN, JR., Member
- VESNA B. DIMITRIJEVIC, Member
- GREGORY H. HALNON, Member
- JOSE MARCH-LEUBA, Member
- JOY L. REMPE, Member
- MATTHEW W. SUNSERI, Member

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6. 10 CFR Part 53 - Subpart J - Reporting and
Other Administrative Requirements

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Adjourn 227

P R O C E E D I N G S

9:39 a.m.

CHAIR PETTI: Good morning, everyone. The meeting will now come to order. This is a meeting of the Advisory Committee on Reactor Safeguards Subcommittee on Future Plant Designs. I'm David Petti, chairing this subcommittee meeting.

ACRS members in attendance are Joy Rempe, Ron Ballinger, Charlie Brown, Vicki Bier, Vesna Dimitrijevic, Jose March-Leuba, and Greg Halnon. Derek Widmayer of the ACRS staff is the Designated Federal Official for this meeting.

The purpose of today's meeting is to discuss several subparts and topics concerning preliminary rule language for 10 CFR Part 53, licensing and regulation of advanced nuclear reactors.

The agenda includes discussion of the third iteration of Subpart B, technology-inclusive safety requirements, and Subpart C, requirements for design and analysis.

We will also hear about Subpart H, licenses, certifications, and approvals, Subpart I, maintaining and revising licensing basis information, Subpart J, reporting and other administrative requirements, and Subpart F, requirements for

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1 operations, staff training, personnel, and human
2 factors. Other efforts related to Part 53 rulemaking
3 will also be discussed.

4 The subcommittee will gather information,
5 analyze relevant issues and facts, and formulate
6 proposed positions and actions as appropriate. This
7 meeting is one in a series of subcommittee meetings
8 being held to discuss Part 53, and at present, there
9 isn't a session scheduled yet for this matter to be
10 taken up with the full committee.

11 The subcommittee meeting is planned for
12 both today and tomorrow morning, but there is a
13 possibility that we may finish all discussions today.
14 We will discuss the need to continue the meeting
15 tomorrow as we near the end of today's deliberations.

16 The ACRS was established by statute and is
17 governed by the Federal Advisory Committee Act, FACA.
18 The NRC implements FACA in accordance within its
19 regulations found in Title 10 of the Code of Federal
20 Regulations Part 7.

21 The committee can only speak through its
22 published letter reports. We hold meetings to gather
23 information and perform preparatory work that will
24 support our deliberations at a full committee meeting.

25 The rules for participation in all ACRS

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1 meetings, including today's, were announced in the
2 Federal Register on June 13, 2019.

3 The ACRS section of the U.S. NRC public
4 website provides our charter, bylaws, agendas, letter
5 reports, and full transcripts of all full and
6 subcommittee meetings, including slides presented at
7 the meetings. The meeting notice and agenda for this
8 meeting were posted there.

9 As stated in the Federal Register notice
10 and in the public meeting notice posted to the
11 website, members of the public who desire to provide
12 written or oral input to the subcommittee may do so
13 and should contact the designated federal official
14 five days prior to the meeting as practicable.

15 Today's meeting is open to public
16 attendance and we have received no requests to make an
17 oral statement. Time is provided in the agenda after
18 presentations are completed for spontaneous comments
19 from members of the public attending or listening to
20 our meetings.

21 Today's meeting is being held over
22 Microsoft Teams, which includes a telephone bridge
23 line allowing participation of the public over their
24 computers using Teams or by phone.

25 A transcript of today's meeting is being

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1 kept. Therefore, we request that meeting participants
2 on Teams and the bridge line identify themselves when
3 they speak, and to speak with sufficient clarity and
4 volume so that they can be readily heard.

5 Likewise, we request that meeting
6 participants keep their computer and/or telephone
7 lines on mute when not speaking to minimize
8 disruptions. At this time, I ask the team attendees
9 to make sure they are muted so we can commence the
10 meeting.

11 We will now proceed and I call on John
12 Segala, Branch Chief of the Advanced Reactor Policy
13 Branch of the Office of Nuclear Reactor Regulation,
14 for any opening remarks.

15 MR. SEGALA: Thank you, Dr. Petti. Can
16 you hear me?

17 CHAIR PETTI: Yes.

18 MR. SEGALA: All right, great, thanks.
19 Good morning, everyone. The staff is pleased to be
20 here today. We remain committed to developing a
21 technology-inclusive, risk-informed regulatory
22 framework in accordance with the Commission's
23 direction.

24 The staff continues its novel approach of
25 releasing preliminary rule language to facilitate

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1 early stakeholder engagement as we're doing today.
2 The staff continues to consider input from numerous
3 stakeholders, the public, and the ACRS as we evaluate
4 changes to the preliminary rule language.

5 We plan to release the first iteration of
6 the preliminary proposed rule language for all of the
7 remaining Part 53 subparts over the next several
8 weeks. The preliminary rule language will remain open
9 for discussion as the staff works towards providing
10 the Commission a proposed rule.

11 We are here today in the eighth ACRS
12 meeting to seek feedback on the NRC's development of
13 Part 53 preliminary proposed rule language for
14 advanced reactors. We previously briefed the ACRS
15 seven times this year on the preliminary rule language
16 for Subparts A, B, C, D, E, and F.

17 During the last of those meetings in July,
18 we provided the Future Plant Subcommittee an overview
19 of the Licensing Modernization Project, an overview of
20 the Part 53 preliminary rule language on emergency
21 preparedness, and a status update on the Technology-
22 Inclusive Content of Application Project or TICAP, and
23 the Advanced Reactor Content of Application Project or
24 ARCAP.

25 We appreciate all of the feedback we have

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1 received to date from the ACRS on the Part 53
2 preliminary rule language. Today, we plan to discuss
3 the preliminary rule language released since July,
4 which includes several new and revised subparts.

5 We are looking forward to hearing any
6 insights and feedback from the ACRS today, and that
7 completed my opening remarks. Thank you.

8 CHAIR PETTI: Thank you, John. With that,
9 I guess I turn it over to Bill?

10 MR. RECKLEY: Yeah, that's right, Dave.

11 CHAIR PETTI: Okay, good.

12 MR. RECKLEY: Thank you. So, Bill, if we
13 can go to slide two? As Dr. Petti mentioned, the
14 agenda for today is to go over our latest iteration of
15 Subpart B, which is the general requirements and
16 objectives, Subpart C related to design and analysis.
17 We've allocated a fair amount of time because those
18 are kind of foundational subsections.

19 Then we'll move onto the recently released
20 first iterations of some of the licensing-related
21 material in Subpart H and I, and some reporting and
22 administrative requirements that we are putting in
23 Subpart J.

24 As Dave mentioned, it's possible,
25 depending on the discussions, that we could finish

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1 today. We were just teeing up the last two topics
2 which are staffing related matters, operator
3 licensing, those kinds of things that will be included
4 in Subpart F, and then also an initiative to develop
5 a more traditional approach.

6 But we did not release the text of those,
7 so all we were going to do was kind of tee it up for
8 the next meeting, so that's why we think it might be
9 possible to finish today.

10 If we go to slide three, this is kind of
11 the framework slide that we've used from the beginning
12 and it lays out our structure and kind of philosophy
13 behind Part 53, and it relates to having basically
14 each part of the project life cycle described in a
15 subpart, and those are Subparts C through G, basically
16 design through decommissioning.

17 And those are supported by Subpart B which
18 lays out the overall requirements, the safety
19 objectives, the highest level criteria, and so that's
20 why we've put so much focus on Subpart B and we'll be
21 talking today about our third iteration of that
22 subpart.

23 But we've given this before just to try to
24 describe the structure, and then kind of highlighted
25 is what we're going to be talking about today, mainly

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1 B, C, H and I, and J, and then as I mentioned, teeing
2 up staffing and human factors.

3 So, if we go to slide four, this is our
4 current schedule for this rulemaking, and as we've
5 talked many times, it's quite an aggressive schedule
6 for a rulemaking of this scope. So, you can see in
7 red there, it's September 2021, and it lays out what
8 we would be talking about today.

9 In order to meet the current schedule,
10 which is to get the proposed rule package to the
11 Commission by May, we will need to have a few more
12 meetings with this subcommittee, and then early in
13 2022, we'd be looking to schedule a full committee
14 meeting.

15 So, that just goes to the pace that we're
16 currently on and the challenge for both the staff and
17 relatedly to the ACRS for the current schedule. So,
18 let's go onto slide five and we can start to talk
19 about the structure.

20 It has been a couple of months. As John
21 mentioned, our last meeting was kind of a refresher or
22 introduction, depending on whether you were here or a
23 new member to the licensing modernization kind of
24 format and structure, and so it's actually been a few
25 months, so we thought we would summarize the Part 53

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1 discussions a little bit more.

2 Going to slide six, this is just the table
3 laid out in a kind of table of contents format, and
4 you can see again it just goes through the life cycle.
5 We have some general provisions in Subpart A that we
6 presented.

7 We will need to revisit Subpart A, align
8 all of the definitions and so forth as we make
9 additional changes to the other subparts, Subpart B,
10 again, kind of the cornerstone, the safety objectives,
11 design and analysis sections that we'll be talking
12 about today, our most recent iteration on that, siting
13 requirements for Subpart D.

14 Subpart E was construction and
15 manufacturing, then Subpart F, a big subpart because
16 it goes to the requirements for operations, and what
17 we spoke to the subcommittee about under Subpart F was
18 those things related to hardware like configuration
19 control, those things related to programs like
20 radiation protection, emergency planning, in-service
21 inspection, the traditional kind of program
22 requirements.

23 And what we promised was the middle part
24 of Subpart F which relates to operator licensing,
25 overall staffing requirements, training, those kind of

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1 things, and we'll talk about that somewhat during this
2 meeting of the subcommittee, and we'd be looking to
3 release that text, preliminary text in the next week
4 or so, and then hopefully be able to schedule a
5 subcommittee meeting in October to talk about that
6 topic.

7 Subpart G, we also are currently working
8 on that and would hope to get that out later in
9 October on decommissioning. Just kind of since we
10 haven't talked too much about that subpart, we're not
11 really expecting it to be significantly different than
12 current requirements.

13 It will be a challenge because the
14 experience with decommissioning non-light water
15 reactor designs is limited to just a few facilities,
16 so coming up with things like cost estimates will be
17 a challenge and a technical challenge.

18 We will address just the requirement to do
19 that within the rule, but we'll talk about that in
20 October or maybe November with the subcommittee.

21 We're going to talk today about Subpart H,
22 or at least the first part of Subpart H related to
23 design and siting. We're getting ready to release the
24 text on the licensing elements of Subpart H.

25 That's the manufacturing license,

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1 construction permit, operating license, or combined
2 license. That will be released within the next week
3 or so, and then again, that would be, we would hope,
4 on the agenda for October.

5 We'll talk today about Subpart I, which is
6 maintaining licensing basis information, things like
7 updating FSARs, final safety analysis reports, doing
8 evaluations as is currently done under 50.59 for the
9 operating units, and then Subpart J, reporting and
10 administrative requirements, including things like
11 financial qualification requirements and the current
12 reporting requirements under like 50.72, 50.73.

13 CHAIR PETTI: Bill?

14 MR. RECKLEY: Yes?

15 CHAIR PETTI: Just a question, how much of
16 G, H, I, and J are just being pulled from language in
17 Part 50 or 52?

18 MR. RECKLEY: A lot.

19 CHAIR PETTI: A lot, right? Yeah.

20 MR. RECKLEY: Yes.

21 CHAIR PETTI: Okay.

22 MR. RECKLEY: Yeah, we're not -- like
23 under Subpart H on licensing, and we'll talk about the
24 major parts of that later today, but you'll be able to
25 see that we're not really inventing anything new, and

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1 so you'll see the same terms. You'll see the same
2 processes. A lot of those are anchored either in the
3 Atomic Energy Act or have a close relationship to
4 administrative kind of requirements or legal
5 requirements in Subpart 2.

6 So, we'll highlight where we're introduced
7 some changes, but they're not dramatic, I don't
8 believe. I wouldn't characterize them as dramatic
9 changes. So, that's, again, the overall structure.

10 Billy, if we can go to slide seven? Just
11 to summarize, this is a table that actually our Office
12 of General Counsel developed in order to try to follow
13 what we were developing and explain it.

14 And so, if you go through this table and
15 look at what we were trying to address, it can be a
16 challenge to communicate, and we acknowledge that
17 we've not always been successful, so this is yet
18 another way to try to present the same information we
19 gave before, but in a different format, hoping that it
20 could clarify what we were trying to do.

21 So, basically, the table is broken down
22 into those things that are related to normal
23 operations and those things that are related to
24 unplanned events, and then when we get to the next
25 slide, the unplanned events are divided into the

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1 design basis accident and the events other than design
2 basis accidents.

3 So, you can see in the table the overall
4 safety objective, and we're going to talk about each
5 subsection in a little more detail and make sure you
6 understand what we did on the last iteration, but it's
7 just summarized here in the table.

8 So, the safety objective of the whole Part
9 53 is to limit the possibility of either an immediate
10 threat to public health and safety and to control the
11 overall risk that's introduced to the public from a
12 nuclear power plant in their area, and that is
13 achieved through the identification and fulfillment of
14 safety functions, and again, we'll talk about the
15 individual subsections.

16 Now, one thing that Part 53 does and this
17 iteration does a better job, I think, of making a
18 distinction between normal operations, normal
19 evolutions, normal release of effluence, and unplanned
20 events.

21 So, the table here lays out in green those
22 things that are related to normal operations, and we
23 will have criteria associated with those which are the
24 traditional ones from either, primarily from Part 20.

25 That's achieved by the design, which

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1 enables things like normal effluence to be controlled,
2 and then as we talked about in a previous meeting, on
3 the operations side, it's controlled by the licensee,
4 their implementation, maintenance of the systems, and
5 procedures and other programs.

6 But from the design side, just trying to
7 understand Sections B and C, the criteria are the Part
8 20 criteria, things like not exceeding 100 millirem in
9 a year, and then also the requirements to maintain
10 doses to both the public and workers as low as is
11 reasonably achievable.

12 And so, from the design side, a designer
13 would have to identify design features that help meet
14 that, and then for those design features, they're
15 going to have to say what does that system do?

16 Is it a barrier? Is it a filter?
17 Whatever it is, the functional design criteria would
18 say the filter has to be this efficient or the barrier
19 has to be this efficient.

20 So, that's the normal operations. If we
21 go to slide eight, Billy, most of the discussion, both
22 historically and even within Part 53, goes to what is
23 done to control unplanned events.

24 And so, within Part 53, and again, we've
25 always said that one way to do Part 53, one available

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1 guidance document will be the licensing modernization
2 process.

3 So, you'll see some introduction of
4 terminology that's consistent with that, consistent
5 with NEI 1804 and Regulatory Guide 1.233 in which we
6 endorse the licensing modernization process program.

7 So, that includes the need to identify
8 licensing basis events, and so for the DBA, Part 53
9 does include a requirement to identify design basis
10 accidents, and then we'll get into the discussion
11 later about the more specific requirements on the DBA,
12 but it looks fairly consistent with the DBA from the
13 current processes.

14 And then for the non-design basis
15 accidents, Part 53 uses the language of anticipated
16 operational occurrences, unlikely events, and very
17 unlikely events, and this generally, this aligns with
18 the LMP categories of anticipated operational
19 occurrences, design basis events, and beyond design
20 basis events.

21 But for each event category, then there
22 are safety criteria identified both in Subparts B and
23 C. The criteria for the design basis accident is the
24 traditional siting dose value out of both Parts 50 and
25 52. That's the 25 rem over two hours or over the

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1 course of the event.

2 I'll hold off talking about the design
3 criteria for other events. The overall or cumulative
4 metric remains the quantitative health objectives or
5 QHOs from the NRC safety goal policy statement.

6 So, for the DBA, in terms of how it's
7 implemented in terms of plant hardware, the equipment
8 relied upon for the DBA is safety-related equipment.

9 For other events, non-DBA events, the
10 hardware is evaluated, and if any special treatment is
11 required to support the analysis of those events, then
12 coming out of that will be any special treatment
13 requirements.

14 So, that's one thing that we're trying to
15 do in Part 53 is there's been a long, long history for
16 the light water reactor regulations of safety related
17 and then important to safety, which includes safety
18 related, but also includes other equipment that may
19 warrant special attention.

20 So, we're just trying to lay that out a
21 little more clearly here, and from the beginning, lay
22 out how to identify the special treatment
23 requirements, and the build within Part 53 what
24 controls and measures would be taken to make sure that
25 the special treatment requirements provide the

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1 necessary capabilities and reliability or availability
2 of the equipment for those non-DBA licensing basis
3 events.

4 Then we talked the last time, because I
5 tried to lay out sort of a parallel between what Part
6 53 does and what exists in Part 50, largely through
7 the general design criteria, which in my view or the
8 way I think of it, the general design criteria were
9 basically developed using a process similar to this in
10 which you consider what design features were going to
11 be used to fulfill safety functions, and then for
12 those design features, how did they need to perform?

13 What are the functional design criteria
14 that are placed upon those equipment to meet the
15 requirements of the analysis? And that might be
16 different between the DBA and the non-DBA events, but
17 again, we'll talk about that as we get into the
18 specific sections.

19 Then the analysis row is just summarizing
20 again how the design basis accident is evaluated using
21 a fairly traditional deterministic approach. It's
22 related to the PRA in terms of identifying the events
23 that will be assessed as DBAs, but a more traditional
24 approach, whereas the non-DBA events are analyzed
25 using best estimate type approaches with a specific

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1 accounting for uncertainties, and again, we'll talk
2 about that later on.

3 Defense in depth, somewhat new in Part 53
4 is to call it out specifically as a criteria within
5 Subpart B. I think we've had discussions of that a
6 number of times with the subcommittee.

7 It's embedded within the current
8 requirements, but given we're taking a technology-
9 inclusive approach, we just point it out as a separate
10 requirement to take into consideration by the
11 designers.

12 And then the last column there, the last
13 row is just talking about special treatments and how
14 those things would be, how the availability and
15 capability of equipment would be ensured. And so, for
16 the DBA, and again, this is very similar to how it's
17 done now, for the DBA, we would expect those controls
18 to be in places like technical specifications.

19 It's safety-related equipment, so it would
20 follow quality assurance requirements under what's now
21 in Appendix B, but for non-DBA LBEs, the special
22 treatment would be largely controlled in accordance
23 with licensee programs like a reliability assurance
24 program as is currently used.

25 So, again, just a summary. Hopefully that

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1 helps a little bit refresh people's minds what we
2 talked about in previous meetings.

3 I think we'll talk about each one of those
4 items in a particular slide, so I'll just hold off or,
5 I mean, certainly the members can chime in anytime,
6 but we will be getting into each one of those things
7 in more detail later this morning.

8 So, Billy, if we go to slide nine, I did
9 want to summarize how we were looking at the interim
10 letter provided by the ACRS, the full committee, in
11 their May letter.

12 So, just going -- again, I'm summarizing
13 it since it was a few months ago. The interim letter
14 basically said the overall structure of what we talked
15 about in the one slide or in the table of contents was
16 a reasonable approach.

17 We have to date maintained that structure
18 and not really looked to deviate too much from how
19 it's been described since our first meetings.

20 One comment, comment number two was that
21 it would be helpful to have kind of an explanation of
22 how the various subparts and individual sections work
23 together, and we are working on that.

24 That will be a combination of language
25 that will be in the rule, as well as within the

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1 statement of considerations that accompany the rule,
2 and in associated guidance, so that's working.

3 I'll say you won't see that today in terms
4 of changes to either the third iteration of B or C or
5 the new sections. They were kind of already being
6 developed in the summer time frame, so we haven't made
7 any fundamental changes.

8 And probably from your point of view, we
9 haven't made any improvements in regards to that
10 recommendation at this time, but we are continuing to
11 work on it as part of the development of the overall
12 package.

13 So, going to the third conclusion and
14 recommendation, it went to the confusion and the value
15 associated with our previous iterations within Subpart
16 B of calling it tier one and tier two. We'll talk
17 about the language change that we've made. Hopefully
18 that makes it a little more clear.

19 Also, part of A was for us to continue to
20 look at the QHOs and determine if they were an
21 appropriate metric. So, again, we'll talk about that
22 when we talk about Subpart B's third iteration.

23 The letter B goes to providing flexibility
24 in the criteria to support. We think that we're
25 allowing that in Subpart B and the supporting Subpart

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1 C, but we can have a specific discussion on B, and
2 those who offered up that comment can kind of weigh in
3 as to whether our changes have scratched that itch.

4 Now, item C is we should include some
5 overarching general principles. Much of that
6 discussion was related to quality assurance
7 requirements and also some of the higher level or
8 crosscutting general design criteria, and we're
9 working on those to see how we can address them.

10 Our view was that this was largely an
11 organizational matter, but we'll acknowledge that and
12 we are evaluating how we might change how we present
13 that information, not only to make sure that it's
14 addressed, that each item is addressed, but also to
15 make sure, kind of the same as item two, to make sure
16 that it flows and people can readily recognize those
17 kind of crosscutting requirements.

18 So, if we go to slide ten --

19 MEMBER BROWN: Bill?

20 MR. RECKLEY: Yes?

21 MEMBER BROWN: This is Charlie. Can you
22 go back for a second?

23 MR. RECKLEY: Sure.

24 MEMBER BROWN: That last item C, 3C, maybe
25 I've missed it somewhere else. You mentioned the

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1 general design requirements. There was a considerable
2 discussion on that, you know, from Walt, and myself,
3 and I've forgotten who else. Is there some -- have
4 you intended to try to address how we deal with the
5 current general design requirements or, you know, the
6 GDCs, the GDs, or whatever they're called?

7 MR. RECKLEY: Yes, the question of have we
8 and are we continuing to consider how we address them,
9 yes, and we'll get into some specifics. We have not
10 added the equivalent to general design criteria. We
11 --

12 MEMBER BROWN: Okay, I wanted to make sure
13 I understood that because --

14 MR. RECKLEY: Okay.

15 MEMBER BROWN: -- Walt, I think one of our
16 points in that was not just -- maybe we didn't say it
17 very well --

18 MR. RECKLEY: No, no, no, yeah.

19 MEMBER BROWN: -- just not excerpting --
20 obviously some of them don't necessarily apply --

21 MR. RECKLEY: Right.

22 MEMBER BROWN: -- that could be deleted,
23 but a large number of them, in our opinion obviously,
24 could obviously apply, and one of my thoughts
25 subsequent to that, I was getting worried that maybe

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1 they would start being spread out as opposed to
2 coherently put in one place like they are right now in
3 Part 50, so that's really the thrust of my question.

4 You're saying you really haven't addressed
5 how those are going to be used or not used yet, and
6 the second part of that is if we're going to do them,
7 they ought not be spread out. That's just my other
8 thought.

9 MR. RECKLEY: Right, and I understand
10 that. I think we've made a move in that direction.
11 It won't, it probably won't go as far as you and Walt
12 had suggested, that there be basically something that
13 looks a lot like Appendix A to Part 50, but --

14 MEMBER BROWN: Obviously, we're very much
15 in favor of something that looks like Appendix A.

16 MR. RECKLEY: I know.

17 MEMBER BROWN: I think you're fairly clear
18 with that.

19 MR. RECKLEY: Yes.

20 CHAIR PETTI: Just as a point of
21 clarification, the letter was specifically written
22 because there was not unanimity on this particular
23 comment, so, you know, the words in the letter are
24 what, you know, what the committee agreed to, so.

25 MR. RECKLEY: Right, no, we --

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1 CHAIR PETTI: Yes.

2 MR. RECKLEY: We understand it was an
3 interim letter, and again, we appreciated kind of a
4 mid-course assessment. I'm just kind of going over
5 here quickly so that when we get into the sections,
6 you can see where there still may be a delta and where
7 we've made changes to address a specific comment.

8 So, if we go, Billy, to slide ten, the
9 letter D was to AOs and establishing safety criteria.
10 This is another case that we made a revision. We can
11 talk about the revision we made. It's not likely to
12 be as specific as the discussion we had on this topic.

13 In terms of the members who pushed this,
14 we still may not be as specific as that discussion
15 went, but we did make some changes to Subpart C to try
16 to address that matter, and likewise on letter E in
17 terms of reaching a safe, stable subcritical
18 condition, we made some changes to Subparts C and D
19 that we'll describe.

20 Within the design and analysis, the letter
21 talked about using a graded approach to PRA. We will
22 talk about this iteration of B and C.

23 We'll also talk about an initiative that
24 we've undertaken and that we're going to tee up today
25 and release some text to talk about in the October

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1 meeting that really would provide a more deterministic
2 or traditional alternative to designers, and so that's
3 one way we're addressing this.

4 And then we are also continuing to look at
5 even potentially other alternatives where the PRA is
6 or the role of the PRA can vary where being central or
7 a leading role to being used as it is now in Part 52
8 as a confirmatory tool, or perhaps for some designs,
9 and we're still in the early stages of looking at
10 this, whether a design can be simple enough and a
11 conservative evaluation of the consequences could be
12 done, in which case an approach like a maximum
13 hypothetical accident might be modeled and have little
14 or no role for a broader probabilistic risk
15 assessment.

16 B and C go to the design basis accidents
17 and then also the traditional Part 50 single failure
18 criterion. We had talked in terms of C. We don't
19 include a requirement in Part 53 for the single
20 failure criteria and it's replaced by a need to have
21 a reliability assurance program that is based on the
22 probabilistic risk assessment a little more formally
23 than is done now.

24 That is something I think we believe will
25 be described in the statement of considerations, and

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1 so you won't necessarily see rule text saying why the
2 single failure criterion is not there, but that is
3 definitely something we would need to describe within
4 the statement of considerations.

5 And then lastly, there was an earlier
6 letter in October 2020 to address, to make sure that
7 uncertainties are addressed and to make sure that a
8 very thorough evaluation is done for initiating events
9 and the behavior of the reactor in response to those
10 initiating events.

11 And we'll talk about those in Subparts C
12 and H, including the possible use of prototype
13 testing, which I think when we talk about Subpart H,
14 you'll see that we basically maintained something very
15 similar, similar words to what's currently in 50.43 E
16 for demonstrating the feasibility and the reliability
17 of safety equipment through analyses testing, and if
18 needed, prototype plants, so.

19 MEMBER BROWN: Bill?

20 MR. RECKLEY: Yes?

21 MEMBER BROWN: Oh, I'm sorry. Go ahead,
22 Dave.

23 CHAIR PETTI: Yeah, just a question on the
24 statement of consideration. I'm assuming that comes
25 at the very end and that we'll get to look at it?

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1 MR. RECKLEY: Yes, you'll get to see the
2 whole package, including the statement of
3 consideration.

4 CHAIR PETTI: Yeah, okay. Go ahead,
5 Charlie.

6 MEMBER BROWN: Okay, just you're still on
7 -- yeah, we still got the right slide up. When you
8 talk about the rule eliminates single failure criteria
9 but needs to define the process that replaces it, I'm
10 trying to wrap my brain around thinking about what
11 kind of process could you possibly have that even
12 comes close to replicating the single failure thought,
13 and I don't know quite why --

14 I guess I don't understand even from the
15 other meetings why that's even being eliminated.
16 We're going to have a single and a half. That's a
17 little tongue in cheek, maybe a single and a half
18 failure? The process seems to be --

19 MR. RECKLEY: Yeah.

20 MEMBER BROWN: I have a hard time
21 envisioning that after 40 --

22 MR. RECKLEY: Yeah.

23 MEMBER BROWN: -- after 40 years.

24 MR. RECKLEY: No, no, that's fair enough,
25 but the rationale is that by requiring the

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1 probabilistic risk assessment that's looking at a wide
2 variety of failures and successes, and then using that
3 evaluation, that analysis to ensure defense in depth
4 is provided, to ensure that the appropriate capacity
5 of equipment and availability of equipment is
6 identified, that that serves the purpose that the
7 single failure criterion had provided in the
8 deterministic approach.

9 And this goes back, you know, a couple of
10 decades actually to this being presented to the
11 Commission to say can a probabilistic risk assessment
12 and an accompanying reliability assurance program to
13 make sure that the actual performance of the plant is
14 in conformance with the PRA, could that be used as an
15 alternative to the single failure criterion, and the
16 Commission agreed to that.

17 Again, that was back in the early 2000s.
18 So, it is just, it's basically just a different
19 approach to the design, and we think that you get to
20 a similar place in terms of safety, so that's the
21 short summary.

22 MEMBER BROWN: Well, does it even -- I
23 mean, it almost sounds like it's a -- you're allowed
24 to -- not even evaluate. Everything's going to be
25 fine if you have no failures as opposed to having to

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1 sustain a single failure, and I'm thinking about the
2 diagrams in the PRA. If there are no failures that
3 you have to consider, that you have to withstand, then
4 it looks like you never get past the first line. I'm
5 obviously struggling with the words --

6 CHAIR PETTI: Charlie, let me give you my
7 view on this, is that the process as Bill defined it
8 provides a technical basis for these other
9 technologies to come up with the right single failure
10 criterion because the systems are different. The way
11 they're potentially configured are different, and how
12 do you know you've picked the right one?

13 And that's what I always liked about the
14 process is that it was a systematic way to look at
15 everything to make sure that you didn't forget
16 something and go oh, that really wasn't the worst
17 single failure, that we should have looked over here,
18 but we weren't thinking about that. So, I think it
19 provides sort of a rationale and a systematic look at
20 it.

21 MEMBER BROWN: Well, I kind of looked at
22 it slightly different, I guess. To me, all reactors,
23 no matter what their configuration and no matter what
24 their technology, they have to be able to be shut down
25 in one way or the other reliably, and you've got to at

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1 least make sure they don't do something bad reliably.

2 And so, coming up with a conclusion
3 looking at the new technologies, you're going to say
4 -- I mean, you're going to have a trip system of some
5 kind. It may not be the same rationale.

6 It may not be looking the same, but it's
7 got to work when you want it to shut down and you want
8 to maintain, you know, the level of criticality of,
9 you know, your shutdown, or at least that's my
10 opinion, and that's why I'm having a hard time saying
11 --

12 (Simultaneous speaking.)

13 CHAIR PETTI: Yeah, I --

14 MEMBER BROWN: You have to shut down all
15 of these plants and they all have to be safe.

16 CHAIR PETTI: I actually don't see a huge
17 change in reactor shutdown. I see this having
18 differences in things like how one removes the heat
19 and some of the other safety functions and less so on
20 protection.

21 MEMBER BROWN: Yeah, but that removal of
22 the heat has to have some failure association with it.
23 What if you have --

24 CHAIR PETTI: Yes, it does, of course, of
25 course.

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1 MEMBER BROWN: And so, that's still a
2 single failure type of thing. You've got to be able
3 to survive a single failure of your cooling system,
4 whatever that is.

5 CHAIR PETTI: Right, the PRA will show
6 that, but how the heat is removed in the advanced
7 systems is very different, and so one needs a more
8 systematic approach to make sure that you pick the
9 right single failure if you will.

10 MR. RECKLEY: Right, and combinations of
11 failures.

12 CHAIR PETTI: Yeah.

13 MR. RECKLEY: I mean, there's strengths
14 and weaknesses to both approaches, and again, so maybe
15 it will become a little more clear as we walk through
16 the individual sections, but it is kind of a different
17 way and it goes all the way back to basically a Part
18 50 structure that says if you meet these requirements,
19 then your reactor has appropriately addressed the
20 safety requirements.

21 And one way to do that is to say I have a
22 system that can remove heat and then you say okay, if
23 that train fails, I need backup, so you have two
24 trains, and then under the Part 53 or a risk-informed
25 approach --

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1 Again, this goes back even to the days of
2 NUREG-1860 and the development of the first
3 technology-inclusive framework back in that time frame
4 of evaluating the availability of heat removal systems
5 and assuming failures of one or two, and then using
6 the PRA and the results of that to say when am I
7 comfortable that I have enough heat removal systems
8 and then using the defense in depth assessment to say,
9 to try to get around the one thing you said, Charlie,
10 which was assuming no failures.

11 And we really did try to circumvent that
12 through the defense in depth element of saying you
13 can't rely on one thing in order to ensure the success
14 because that, even if you wanted to try to argue that
15 it was very reliable and that you could meet all of
16 the numerical objectives, that the uncertainties are
17 such that, from a defense in depth philosophy, you
18 should have a backup.

19 You shouldn't be able to try to argue that
20 the reliability of one thing is so great that you
21 don't need to assume its failure, but I see a hand up,
22 so.

23 CHAIR PETTI: Vicki, go ahead.

24 MEMBER BIER: Yeah, this is Vicki. Let me
25 try a question and see if I'm off base on

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1 understanding this. Your example of, well, you need
2 heat removal, and then by single failure, what if
3 something fails? Okay, that means I need a second
4 train.

5 I'm wondering if part of the issue is that
6 some of the designs may not be so kind of discrete as
7 far as what's a single failure versus a double
8 failure, et cetera.

9 So, if I think about, I don't know,
10 passive heat removal through natural convection, is
11 there anything to postulate that has failed or is it
12 more just, hey, we had some of the parameters
13 estimated wrong and the system doesn't work the way we
14 thought it did, and we still have to be able to
15 analyze that without postulating a single failure. Is
16 that part of what's going on here or am I
17 misunderstanding?

18 MR. RECKLEY: No, I think that's fair, and
19 those passive systems, at least what we've seen to
20 date, those passive systems can be highly reliable.
21 Some of them are in constant operation, so, I mean,
22 they're rejecting heat even when the reactor is
23 operating, so you have some comfort that it's
24 available.

25 But there are uncertainties on something

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1 like natural convection, that it can be interrupted by
2 various things or you do need a flow path for that, so
3 external factors, or weather, or whatever.

4 So, even in those systems, those plants
5 that have used those kind of passive heat removal
6 systems, we've seen them have backups and, you know,
7 sometimes those are going to be actually -- they might
8 be mechanical or electrical powered systems, but there
9 is a backup even to the natural circulations systems.

10 MEMBER MARCH-LEUBA: Yeah, this is Jose.
11 I've been trying to stay out of this, but you and Dave
12 keep bringing up examples of the good designers that
13 have built into their design backups.

14 The question to you is, is this required
15 in the rule or is it something nice that a couple of
16 examples that you're familiar with did it? And if
17 it's not required in the rule, why is it not?

18 MR. RECKLEY: I would say what I've
19 described, and Dave clarified it some, is required in
20 the rule.

21 MEMBER MARCH-LEUBA: What is required in
22 the rule, single failure?

23 MR. RECKLEY: No, not to address in the
24 traditional way a single failure criterion. That is
25 associated really with a deterministic kind of

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1 engineering approach.

2 What is required is to assess the
3 potential failure of all of the equipment and
4 combinations of equipment and ensure that the criteria
5 that we'll talk about under Subparts B and C can all
6 be satisfied, which is, in our view, what the single
7 failure criterion was trying to achieve.

8 MEMBER MARCH-LEUBA: But remind me, when
9 you allow failures of components, you also relax the
10 acceptance criteria, is that correct?

11 MR. RECKLEY: I don't follow. I mean --

12 MEMBER MARCH-LEUBA: When you have the
13 DBAs, do you use the same acceptance criteria then for
14 an AOO?

15 MR. RECKLEY: No.

16 MEMBER MARCH-LEUBA: Okay, so you relax.
17 Whenever you assume failures, you relax acceptance
18 criteria?

19 MR. RECKLEY: As the frequency of the
20 failures and combinations of the failures goes down,
21 then the --

22 MEMBER MARCH-LEUBA: You relax acceptance
23 criteria.

24 MR. RECKLEY: Just as is done now.

25 MEMBER MARCH-LEUBA: Yeah, yeah, okay, I

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1 just wanted to support Charlie's position. I'm
2 extremely uneasy about the fact that the rule relies
3 on that the designer will be nice and will do things
4 the way the guys you're working with are doing it now,
5 but the rule should consider future and bad designers
6 too. That's what the rule is for, is to ensure a
7 minimum requirement. I've said enough.

8 MR. RECKLEY: Okay, and as we go through,
9 again, I don't -- I think the whole process would be
10 just as the current requirements are, to ensure that
11 a bad design doesn't make it through the system. So,
12 we can continue that discussion as we talk about the
13 specific sections.

14 So, if we can go then to the next slide,
15 Billy? So, now we'll start to get into those sections
16 starting with Subpart B, so we just have a --

17 CHAIR PETTI: So, Bill?

18 MR. RECKLEY: Yes?

19 CHAIR PETTI: I know it's a little early,
20 but this may be a good break point depending on how
21 long Subpart B is. We usually take a break, you know
22 --

23 MR. RECKLEY: Yeah.

24 CHAIR PETTI: -- 20 minutes from now.
25 Maybe we take it early and then come back. Does that

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1 work?

2 MR. RECKLEY: Yeah, that would be fine.

3 CHAIR PETTI: Okay, so let's just break
4 until the top of the hour. We're in recess. Thank
5 you.

6 (Whereupon, the above-entitled matter went
7 off the record at 10:42 a.m. and resumed at 11:00
8 a.m.)

9 CHAIR PETTI: Bill, I have 9 o'clock, so
10 take it away.

11 MR. RECKLEY: Okay, thanks Dave.

12 So what we're going to go through is the
13 next iteration of Subparts B and C and then also kind
14 of lay the groundwork for the discussion this
15 afternoon.

16 So, Bill, if you can just, you can skip
17 over 12, and we'll go to 13.

18 On the discussion table that we released
19 for the third iteration of B and C, and we make a
20 similar note on the other subparts, is that one
21 comment that we received from stakeholders are that
22 some designers were interested in approaches less
23 reliant on PRA.

24 This is the more the traditional approach
25 from the designer's point of view. One reason for

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1 this was that they may be interested in international
2 markets. And the licensing processes, the design
3 processes recognized by other regulators are the more
4 traditional approach.

5 And one example of this is what's
6 currently included in the International Atomic Energy
7 Agency specific safety requirements for the design of
8 nuclear reactors currently looks a lot like a
9 traditional Part 50 approach. It's evolved somewhat
10 as NRC regulations, but it has that same basic
11 construct.

12 And some of it goes exactly to what
13 Charlie and Jose were mentioning, a traditional
14 approach using single failure criterion, a
15 structuralist approach where you start from design
16 requirements like the general design criteria.

17 And those designers interested in those
18 markets didn't want to have an NRC process that was
19 different, or only allowed one approach which might be
20 different than those international efforts. So we are
21 looking, and we're going to talk later today or
22 tomorrow morning about developing this more
23 traditional deterministic approach.

24 It's just a recognition that there is more
25 than one way to do a design and to do the licensing

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1 and recognition. It's not like one right, one wrong
2 way. So we will be developing this alternative
3 approach and talking to you in the future about that.

4 What that allowed us to do in this
5 iteration, however, was to focus on the more risk-
6 informed or PRA in a leading role type approach in
7 this iteration.

8 So you will see some of that, especially
9 when we get into, for instance, Subparts H and I where
10 what we require in an application and, in Subpart I,
11 how we are evaluating plant changes to determine if a
12 license amendment is appropriate. We'll have an
13 increased reliance on the PRA, given that that's the
14 structure that we're assuming throughout Part 53.

15 So the alternative approach, we'll tee it
16 up today or tomorrow morning. And then you'll see it
17 in October. But, you know, kind of as a teaser, it's
18 going to look a lot like what you're used to seeing
19 in Part 50.

20 Joy, you have a question?

21 MEMBER REMPE: Yeah, just curious now. If
22 they do an alternate approach that's more traditional,
23 will they need to meet the single failure criteria?
24 The earlier discussion said you were eliminating it.
25 And to do that you have to have some sort of risk

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1 based reliability type of consideration. And I'm
2 just wondering maybe you need to maintain it for those
3 folks.

4 MR. RECKLEY: Yes. And you'll see in the
5 slides later when we talk about this more traditional
6 approach that it brings with it the traditional things
7 like assuming single failure criterion, like needing
8 to address the Commission's severe accident policy
9 statement, a number of things that basically would
10 reflect how the light water reactor requirements
11 evolved over the last 50 years. They would inherit
12 that within those processes.

13 MEMBER REMPE: Okay, that really helps.
14 I think that might have addressed some of the concerns
15 raised by other members if they'd heard that part
16 earlier. Thank you.

17 MR. RECKLEY: Okay. So again, what you'll
18 see then throughout the rest of the day, as we reflect
19 on Part 53, is the more PRA in a leading role type
20 approach. You'll see next month more discussion and
21 preliminary rule language for those designers who may
22 choose to take a more traditional route.

23 So if we go to 14, we could jump into to
24 Subpart B. And I'm just going to highlight some
25 things just to keep in mind, again because it's been

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1 a few months since we've talked about Part 53, and
2 then also some changes that were made in the third
3 iteration.

4 So in terms of the actual criteria, we
5 didn't change that in this iteration. It remains that
6 the overall objective of Part 53 is to limit the
7 possibility of an immediate threat to public health
8 and safety and, in addition, that the Nuclear power
9 plant has to have additional measures considering
10 potential risks to public health and safety.

11 One subtle change, and this is the first
12 time we see the term, and so as the note says we did
13 change universally throughout this iteration, and in
14 the newly released sections, from advanced nuclear
15 plant to commercial nuclear plant.

16 And the significance of that is that using
17 the term advanced nuclear plant seemed to imply that
18 there would be a test for who could use Part 53. And
19 as we looked at the history and the language in the
20 Nuclear Energy Innovation and Modernization Act, the
21 criteria for what isn't under the Act, what they
22 defined as an advanced nuclear plant, it was very hard
23 to limit.

24 Some of the criteria were technical, some
25 of them were energy policy, some others were economic,

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1 and it just did not seem practical to try to say the
2 use of Part 53 is limited to an advanced nuclear plant
3 using a criteria under FEMA. And so we just changed
4 it to commercial nuclear plants.

5 So the advantage of that for us is Part 53
6 is limited to nuclear reactors. It's not, as Part 50
7 is, open to a broader set of production and
8 utilization facilities. As an example, we don't
9 intend to address research and test reactors within
10 Part 53. So we are able to limit the scope, but the
11 scope will be basically any nuclear power plant design
12 would be able to come in under Part 53. So again,
13 that's kind of a subtle change, but we wanted to point
14 this out in case anybody had noticed that language.

15 But in terms of the safety objectives, we
16 did not change them in this iteration. These are the
17 same ones we used in the second iteration.

18 So I see an hand up. Vesna?

19 MEMBER DIMITRIJEVIC: Yes. Sorry, I had
20 to find the microphone. Actually, I was a little
21 confused with this statement of this commercial.
22 Doesn't that mean that any plant coming, whatever,
23 even traditional, you know, light water reactor or
24 whatever advanced designs we went through in NuScale
25 AP1 would be coming through this Part 53?

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1 MR. RECKLEY: It's a voluntary rule. But
2 yes, what we're saying is any of those designs would
3 have available to them Part 53.

4 MEMBER DIMITRIJEVIC: So now when we're
5 discussing PRA or not PRA and, you know, I am a PRA
6 person. But I have not supported using total PRA,
7 you know, for these very advanced designs. And I
8 have agreed with some of the conclusions they can be
9 used in supporting role.

10 But does that mean the plants which have
11 come under Part 52 have submitted the full scope PRA
12 and showed that they satisfy safety goals could be
13 submitting now with no PRA, you know, the similar
14 designs, they will come in now with no requirement
15 from the PRA?

16 MR. RECKLEY: I'm not following. I mean,
17 a light water reactor would be able to come in, and
18 even a non-light water reactor would be able to come
19 in under Parts 50, or 52, or 53. If they come in
20 under Part 53, as we have it structured, and as the
21 previous slide talked about, the assumption is, in
22 this iteration, that they will be using a PRA in the
23 design and the licensing process more so than what was
24 done in the past.

25 So a light water reactor would have to do,

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1 under Part 53, under our proposed language, the full
2 PRA. They would have to do all the assessments that
3 we're going to talk about in the coming sections.

4 MEMBER DIMITRIJEVIC: Well, I thought that
5 we were just discussing here the possible that could
6 be the two different approaches, one when the PRA come
7 in the main role and one when the PRA come in the
8 supporting role. Did I understand that well?

9 MR. RECKLEY: Yes, right.

10 MEMBER DIMITRIJEVIC: Okay. So therefore,
11 there is no -- they could choose the part, right?

12 MR. RECKLEY: Correct.

13 MEMBER DIMITRIJEVIC: And the Part 53 does
14 define safety goals in the CDF and LWRS thing, but it
15 could be some, I mean, they may have option to choose
16 or use the QHO or whatever. It will be different
17 goal, right?

18 MR. RECKLEY: Well, we would not propose
19 to change the safety goals to specifically address the
20 light water surrogates like CDF and LWRS. Those were
21 largely developed working backwards from the QHO. So
22 they would have an advantage, perhaps, in that those
23 surrogates have already been developed.

24 MEMBER DIMITRIJEVIC: Well, I just want to
25 say I have always attributed this to be for advanced

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1 reactor. So now, you know, if I have to think about
2 the, you know, the previous generation, Generation 3,
3 it changes how I think about this. So that's why it
4 truly made me pause when you said this.

5 MR. RECKLEY: Okay.

6 MEMBER DIMITRIJEVIC: Because I thought
7 that this will be reactors coming with very low
8 passive features, low risk, and be different part of
9 that, you know, animal for the licensing. Okay.

10 MR. RECKLEY: Okay.

11 MEMBER HALNON: Bill?

12 MR. RECKLEY: Yes.

13 MEMBER HALNON: This is Greg. The
14 commercial aspect of it, did you guys purposely leave
15 out the word industrial, like 50.22 talks about 103
16 licenses for commercial and industrial facilities.
17 Was that intentional?

18 MR. RECKLEY: Well, our definition of
19 commercial would be for either electrical production
20 or to support an industrial process like hydrogen
21 production or process heat.

22 MEMBER HALNON: Okay. Is that defined
23 somewhere, or --

24 MR. RECKLEY: Yeah, we will have to define
25 it in Subpart A.

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1 MEMBER HALNON: Okay.

2 MR. RECKLEY: Yeah. But we didn't mean to
3 limit to electrical production.

4 MEMBER HALNON: Okay, I just wanted to
5 make sure it's consistent with what people see in
6 50.22.

7 MR. RECKLEY: Right. Okay, so that's the
8 highest objective, the 53.200. Again, we didn't
9 fundamentally change it from the second iteration. If
10 we go to Slide 15, the primary change here was we have
11 heard numerous times the confusion that was introduced
12 and associated with our use of first tier and second
13 tier. It was, in retrospect, a wrong choice. It
14 implied, potentially, importance, it implied or got
15 confused with how that language is used in Part 52.

16 And so what we did in this iteration is
17 two-fold within the safety criteria in 53.210. And
18 the primary change was to actually try to call it for
19 what it actually is. This is the criteria for design-
20 basis accidents. And it we didn't change the actual
21 criteria. It remains, again, the traditional offsite
22 dose associated with design-basis accidents with the
23 siting criteria, as it's been used in Part 100, and
24 Part 50, and 52.

25 The related change, however, was by saying

1 this is the safety criteria for design-basis
2 accidents, we're limiting 53.210 to the unplanned
3 events, and we separated the normal operations into
4 its own section. And we'll talk about that shortly.

5 And then as highlighted below, we did it
6 for the next slide as well. So the change is to the
7 title and in the organization but not a technical
8 change to the criteria itself.

9 And then if we go on to 16, you'll see the
10 next section within Subpart B, 220, 53.220. We
11 changed the title to this is the safety criteria for
12 licensing basis events other than the design-basis
13 accident. We maintain the high level objective as
14 being associated with the cumulative plant risk, and
15 we maintained that the criterion is the NRC safety
16 goal QHO.

17 So these two sections, 210 and 220, had
18 been called first tier, second tier. They are now
19 called Safety Criteria for Design-Basis Accidents and
20 Safety Criteria for Licensing Basis Events, other than
21 design-basis accidents.

22 And then the other change to them was to
23 relocate the requirements associated with normal
24 operations. So we're trying to better describe what
25 they are, but we didn't change the technical criteria

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1 that are associated with these two sections.

2 MEMBER MARCH-LEUBA: So this is Jose. So
3 you've changed just the title, what used to be Tier 2
4 still does not go into tech specs, right?

5 MR. RECKLEY: As we get into Subparts F,
6 the current construct is that the equipment needed,
7 for 210, the safety-related equipment, would go into
8 technical specifications. And the equipment
9 associated with meeting the criteria associated with
10 other licensing basis events would get captured in
11 program documents and licensee-controlled documents
12 associated with the reliability assurance programs.

13 MEMBER MARCH-LEUBA: Okay.

14 MEMBER DIMITRIJEVIC: I just want to say,
15 I mean, I am definitely against using QHO, and I can
16 write the additional comments about that. But here,
17 at least when it comes to the numbers, which we say
18 that our goal is to be five in ten million when it
19 comes to the immediate health effect and two in one
20 million when it comes to latent, that doesn't really
21 make any sense in manual.

22 I know, I mean, where that comes from. It
23 comes from that the nuclear power should present small
24 additional risks to the other risks to the public and
25 then in quantitative, says that you have those says

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1 that small means going by percent. And then they
2 estimate in 1986 that this, during the withdrawals,
3 you know, from the cancers or from accidents, and
4 that's where those numbers come from.

5 However, these numbers imply that they
6 actually know something about this. Because you don't
7 say one in ten million, and you don't say one in one
8 million, but exactly two. So why not 2.5, 3? You
9 know, when the NRC, in '86, defined this goal at least
10 they transferred it to the round numbers to the CDF
11 and LWRS, CDF ten to minus four and LWRS ten to minus
12 five. It's approximation. This is all being
13 approximation of everything.

14 So why do you have a specific five and
15 two, you know? That's really -- and I think if you
16 want really to make attempt to use this QHO, you
17 should, you know, look in maybe new statistics on the
18 risk and make some approximate numbers, not such a
19 specific number.

20 MR. RECKLEY: Okay, and point taken. We
21 have looked more recently at those numbers and whether
22 the derivations of those numbers from the 80s remain
23 valid. I know that was done for some of the Fukushima
24 work and for the updating of guidance on regulatory
25 analysis. And basically, the numbers still hold.

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1 Using the exact numbers, I understand what you're
2 saying. But in terms of doing a confirmatory look,
3 the staff has done that in recent times.

4 Okay. So that's basically the changes we
5 made to 210 and 220, again trying to clarify and be
6 more specific as to what the roles of those criteria
7 area are.

8 If we go to the next one, 230, these are
9 safety functions. We made some conforming language
10 changes. Again, for safety functions, the primary
11 safety function is limiting the release. And then
12 there's a requirement that a designer or applicant
13 identify additional safety functions as needed to meet
14 the criteria.

15 We had given examples. One comment or
16 discussion we had had in the past was to specifically
17 include reactivity in the examples. We have addressed
18 reactivity in Subpart C, so hopefully that will
19 address the people who had that concern.

20 We didn't include it here again, primarily
21 because these were just examples, and they'll be
22 safety functions for both radioactive inventories
23 associated with the core and then also radioactive
24 inventories in waste systems or other systems. But
25 when we get to Subpart C, hopefully we can have the

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1 discussion on any specific requirement related to
2 subcriticality.

3 So Slide 18, again this is trying to put
4 into context the discussion I think we had at the last
5 two meetings where the safety functions are this
6 highest level criteria. And there's the primary,
7 which actually relates to the release of radionuclides
8 outside the plant. And then there is the additional
9 one such as controlling reactivity or heat production,
10 the removal of heat. And then in this example, we
11 used, from the modular high temperature gas reactor,
12 MHTGR, they included chemical interactions as an
13 additional safety function.

14 But then looking forward, when we get into
15 Subpart C, that those safety functions are achieved
16 using a combination of design features and also human
17 actions, we'll talk about that a little later, maybe
18 tomorrow morning, and then functional design criteria
19 which lay out the specifics for what a design feature
20 has to do.

21 So if a design feature is a barrier, a
22 functional design criteria might be a leak rate. If
23 a design feature is a heat removal system, then the
24 functional design criteria would go to more of the
25 specifics of how much heat to remove.

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1 So this is the basic structure. And as we
2 talked about last time, and I know there's not
3 universal agreement, but that this gets you to a
4 similar place as the GDC, because this is the exercise
5 that they went through in the late '60s and '70s to
6 come to the GDC for light water reactors, and a
7 similar exercise when we went through the development
8 of that advanced reactor design criteria, or ARDC, in
9 Regulatory Guide 1.232. This similar exercise was
10 done to add requirements for technology such as metal
11 cool reactors or gas cool reactors.

12 MEMBER HALNON: Hey, Bill, this is Greg.

13 MR. RECKLEY: Yes?

14 MEMBER HALNON: I know that, you know, I
15 came into this a little bit later in 2021. But I know
16 that there are some thoughts that there should be some
17 form of the GDC or something like that, to your last
18 comment. Did you guys look at the GDC and see if
19 there's any of those, or concepts that transcended any
20 technology as opposed to just saying, well, we're not
21 sure what we're going to get, so we'll just make it
22 real general?

23 MR. RECKLEY: Well, I think when you look
24 at the GDC, the GDC is laid out in four sections. And
25 the sections are reactivity, fluid systems or heat

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1 removal systems, and containment systems, or retention
2 of radionuclides. And then the fourth category is
3 things like electrical power, quality assurance, fire
4 protection, that go cross cutting across those
5 functions.

6 And so the answer to your question is yes,
7 we looked at it in quite a bit of detail, especially
8 given that we went through the exercise of developing
9 the ARDC, and feel comfortable that this process gets
10 you to the same place.

11 MEMBER HALNON: Okay. All right. I
12 haven't studied this deeply enough to have a great
13 conversation with it, but I just wanted to see,
14 relative to what we tried and true over the years, and
15 it sounds like you've done your due diligence.

16 Let me view this a little bit more. Next
17 time we get together I'll be more --

18 MEMBER REMPE: Greg, this is Joy. And
19 just so you understand the acronym, ARDC is advanced
20 reactor design criteria. And Bill's referencing a
21 document where they did some sample design criteria
22 for a gas reactor, a sodium reactor, I've forgotten
23 what else, a general one. So they did do quite a bit
24 on that.

25 MEMBER HALNON: All right. Thanks, Joy.

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1 MR. RECKLEY: And as a specific example,
2 and it was the one I mentioned before on the previous
3 slide, one place where there was a concern, both by
4 the staff and some members, that this approach may not
5 capture something was an area of subcriticality.

6 And so in looking at that, and you can
7 take that from GDC 26 or 27, I forget. But we went in
8 and said we're not sure that the methodology that
9 we've laid out here does that. So we added a specific
10 design requirement.

11 And there was another internal discussion
12 whether long term cooling was captured by this
13 methodology, so we likewise included a specific
14 requirement for that. So we did look through and use,
15 because like you said, this is a, you know, it's a
16 long standing, tried and true process. So we looked
17 through and did assess, and if anything was missing,
18 used a specific requirement within Part 53 to fill the
19 gap.

20 But we'll get to that when we talk about
21 Subpart C. So anyway, just wanted to repeat this
22 slide for the general structure. When we get to
23 Subpart C, we'll see the design features and
24 functional design criteria.

25 If we go to Slide 19, Billy. This is

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1 laying out a requirement in 53.240 for the
2 identification of licensing basis events. We really
3 only made conforming changes here. The assessment is
4 that, or the requirement is that they identify
5 licensing basis events, including a wide spectrum from
6 anticipated to very unlikely.

7 We did add the sentence, this is more
8 editorial, but we did add a sentence that they are
9 required to do one or more design-basis accidents in
10 accordance with the analysis section, 53.450. Just
11 clarifying, we didn't think anybody thought otherwise,
12 but given we changed the title of Section 210 to
13 design-basis accidents, it just seemed appropriate to
14 reflect that within licensing basis events to make
15 sure everybody was absolutely clear that you have to
16 do a design-basis accident evaluation.

17 Going on to Slide 20, we didn't make any
18 changes to the defense in depth requirement. Again,
19 this goes, we think, in some measure to addressing the
20 concerns that Charlie had that you might be able to
21 argue, or somebody may try to argue, that a system is
22 so reliable that you don't need to assume it's
23 failure, and you have no backup to it.

24 The last sentence in this requirement is
25 that you're not allowed to do that. No single

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1 engineered design feature, or human action, or
2 programmatic control should be exclusively relied on
3 to meet the criterion in either 220 or 230. So that's
4 the safety functions, and meeting the QHO.

5 So if we go on then to the next one, we
6 added a section, 53.260, for normal operations.
7 Because we took it out of what had been called the
8 first tier under 210. So we still want a high level
9 objective to address normal operations.

10 And the requirement is that, under
11 Paragraph A, licensees under this part have to ensure
12 they meet the Part 20 dose, that's the 100 millirem in
13 a year dose. And it may be subtle, but that's the
14 reason I highlighted it, licensees under this part.

15 And that's in recognition that although
16 the design contributes to the ability to meet that,
17 it's only the design in combination with programs and
18 procedures that can ensure that an actual dose does
19 not exceed the 100 millirem due to normal effluents.
20 And so that's one change.

21 But, and this has remained a continuing
22 point of discussion with some stakeholders, we did
23 maintain Paragraph B that says that both design
24 features and programmatic controls must be established
25 to keep the dose as low as reasonably achievable.

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1 So this is a requirement where we would
2 look at a design, if it was a design related review.
3 And we would look at the combination of the design and
4 the programmatic controls if it was for a actual
5 license.

6 CHAIR PETTI: So, Bill?

7 MR. RECKLEY: Yes?

8 CHAIR PETTI: Just as point of
9 clarification, does Part 20 call out ALARA?

10 MR. RECKLEY: Yes. As --

11 CHAIR PETTI: Okay. I'm talking about in
12 the comment that was made. I mean, if you had just
13 said you've got to meet Part 20, it doesn't, I mean,
14 putting it here is nice, but does it change it
15 anything really in terms of what they have to do?

16 MR. RECKLEY: The reason we continued to
17 want to put it here is, in addition to Part 20, it's
18 also mentioned in places within Part 50 and, by
19 reference Part 52, that does include designers. And
20 that was originally done through Appendix I, the Part
21 50.

22 And it's in other parts of Part 50 and by
23 reference, at least, 52, that we expect, for example,
24 in a design certification, that they will talk about
25 what was done in the design to keep the doses to the

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1 public as low as reasonably achievable for normal ops.
2 So that's the reason we just didn't want to introduce
3 a gap.

4 Now, the reason many stakeholders take
5 issue with this is that this is an area in past
6 reviews where a lot of attention has been paid at the
7 design stage. And some stakeholders think that it's
8 too much too early. So from our perspective, the
9 reason to not include it is because we may have, from
10 a certain perspective, we went overboard in the past.

11 So what we're trying to do is to keep the
12 requirement. And then under the TCAP, RCAP guidance
13 development, the content of application related
14 guidance, we're trying to put this in more of a
15 performance-based framework that should, we think,
16 allow us to address that issue and maybe, through a
17 performance-based approach, get a little less specific
18 at the design stage into design details associated
19 with ALARA.

20 CHAIR PETTI: Okay. Well, that helps a
21 lot. Thanks.

22 MR. RECKLEY: Okay.

23 MEMBER HALNON: And this is Greg. Part of
24 the whole issue is the economics of it. I mean, if
25 you're in the application process, you can do the

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1 financial and the economic benefit analysis that shows
2 so many dollars per rem or whatever, millirem. It can
3 show that it's not reasonable to do it.

4 The problem is the subjectivity of how far
5 you have to go to do this. And it's early on in the
6 design process, so it could change the focus from
7 making sure you have the safest system to making sure
8 you have ALARA. And operational practices can
9 compensate for designs that don't necessarily provide
10 the lowest amount of dose for what you have to do.

11 So I think it's got to be balanced here.
12 And as long as we're able to do that analysis, and
13 continue to do what's reasonable, then I think it's
14 going to be okay. But again, it comes down to the
15 details of the reviewer saying that's not reasonable
16 or it is reasonable and the designer having argued the
17 case.

18 MR. RECKLEY: Yes, exactly, and the level
19 of the design associated with a particular system and
20 where it stands when we're doing the review. And so,
21 yeah, and that's, again, what we're trying to develop,
22 you know, by the guidance.

23 And things changed, and we didn't change
24 the rule. I mean, that was another issue that, you
25 know, Appendix I is still on the books. It's \$1,000

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1 per person rem. You know, when we do a regulatory
2 analysis, we're using a number like \$6,000 per person
3 rem just because of inflation and other changes since
4 that was put in place.

5 So we understand the issue, and we're not
6 trying to make light of it. But at the same time, we
7 didn't want to eliminate the requirement. And we were
8 hoping that the guidance can help reach some middle
9 ground. So another hand?

10 MEMBER BIER: Yes, hi, this is Vicki. I
11 want to follow-up on kind of a related point to Greg.
12 I was just recently looking it over, and I can share
13 some of the information if people are interested.

14 Historically, there is a big tendency that
15 the cost of safety and environmental improvements tend
16 to be way over estimated before they're actually
17 implemented. And I think part of that is just
18 because, you know, industry may have an incentive to
19 say, oh, sorry, that's going to cost so, so much, you
20 can't make us do it.

21 But also sometimes just, in all honesty,
22 the technology doesn't get cheap until it's mandated.
23 And suddenly there is a market for somebody to figure
24 out how to do it cheaper. And so I also worry about
25 this.

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1 You know, I think the cost effectiveness
2 criteria make a little more sense in existing
3 technology where you know exactly what's there, and
4 what's built and, you know, how to change it to meet
5 some new backfit rule or whatever. Whereas in a new
6 technology I think it's going to be very difficult to
7 estimate accurately and with possibly an incentive to
8 overestimate the cost.

9 MR. RECKLEY: Okay, thank you. I
10 understand your point.

11 So again, we'll just continue to engage
12 stakeholders. Again, from our point of view, we laid
13 Part 53 out as the process from design to
14 decommissioning. And although ultimately you don't
15 have to worry about effluents until you have an
16 operating plant.

17 We just wanted to make sure that a problem
18 wasn't overlooked, and kick the can down the road
19 until you get to the operating phase. And now the
20 ALARA requirement kicks in. And it wasn't reasonably
21 addressed at an earlier stage in the process.

22 So it's a tricky balance. We all agree
23 with that. And that's, again, what we're trying to do
24 through the guidance is reach some reasonable measure
25 to make sure that an issue is not ignored early on,

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1 because the Advanced Reactor Policy Statement
2 basically was trying to say, if you do things better
3 at the design stage, you can save things like human
4 actions and other programmatic controls later on. And
5 so it's trying to reach that balance.

6 And whereas -- anyway, I'll just leave it
7 there. I hear what you guys are saying, and I think
8 we're all in agreement. It's just trying find the
9 sweet spot.

10 So if we can go on then to 22. It's a
11 very similar requirement, but related to protection of
12 plant workers. And like we did for normal effluents,
13 Paragraph A is for licensees, because ultimately it's
14 a combination of things that needs to be taken into
15 account.

16 And it's only the licensee at an operating
17 plant that has the ability to ensure an actual dose to
18 an actual person is maintained within Part 20 limits.
19 But then as we did for normal effluents, we include
20 that both the design features and programmatic
21 controls must be used to show that dose to workers is
22 kept as low as reasonably achievable.

23 So these weren't big changes from the
24 second iteration. Primarily the change was in the
25 previous slide, just organizationally to move it out

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1 of the first and second tier to its own section.

2 So that is the third iteration on Subpart
3 B, the overall objectives and highest level safety
4 criteria. I guess we can see if there's any
5 questions.

6 Billy, if you want to go to 23, it's just
7 a slide that says discussions. Or we can just start
8 to get right into the next section which is more
9 specifics that are Subpart C on design and analysis.

10 CHAIR PETTI: I'd just keep going, Bill,
11 if you don't have anything from the members.

12 MR. RECKLEY: Right, I don't see any
13 hands. So thanks, Dave.

14 So if we go down then to Slide 24, and it
15 just shows the design analysis within the overall
16 construct of Part 53. Again, it's kind of the first
17 process, first stage of the design and licensing
18 process.

19 So if we go to the next slide, this is
20 related to the third iteration. And as I mentioned
21 before, for the third iteration, we are basically
22 assuming an approach to the design and the licensing
23 in which the PRA is used as a fundamental tool in both
24 design and licensing.

25 And we will address the alternative

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1 approach where the PRA is done as a kind of
2 confirmatory tool in another series of sections. And
3 the preliminary language for that will be coming out
4 fairly soon. And we would think we could probably
5 address that at the October meeting with the
6 subcommittee.

7 So if we go to slide -- yes, the next
8 slide. Most of the changes, and I didn't include,
9 since these are longer sections, I didn't include the
10 actual preliminary language. If you have access to
11 the table and it would help, we can pull up the
12 discussion table if needed.

13 But just to summarize that 53.400, we kind
14 of changed this just to conform to the changes we made
15 to Subpart B. 53.400 becomes design features for
16 licensing basis events. So these are basically kind
17 of high level requirements that an applicant would
18 have to address design features to address both the
19 design-basis accident criteria, 210, and also the
20 licensing basis events other than the DBA under
21 53.220.

22 And then 410 and 420 lay out that they
23 have to identify the functional design criteria for
24 each of those. So again, if you go to Slide 27 it's
25 the same slide just highlighting.

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1 Now we've gone from safety functions,
2 which are the higher level requirements in Subpart B
3 to identify them, to getting down into the specifics
4 of how they're going to identify them, I mean, what
5 they've identified to fulfill those safety functions.
6 And then what are the actual engineering design
7 criteria for meeting them? Again, if you think of a
8 barrier as the design feature, then a leak rate would
9 be the functional design criteria.

10 So then we can go down to the next one.
11 We did add that design features and functional design
12 criteria had to be identified for normal ops. We
13 added this section because we added the higher lever
14 one in Subpart B. Consistent with what I was saying
15 earlier, we expect this to continue to be an item of
16 discussion with some stakeholders.

17 Because again, this is bringing in the
18 ALARA principle at this stage and saying designers
19 need to address that underlying requirement for the
20 design to consider normal ops and to keep the dose to
21 the public as low as reasonably achievable.

22 53.430, I think, was just renumbered. But
23 it does the same for design features and functional
24 design criteria for the protection of plant workers.

25 If we go to Slide 29, you start to see

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1 some changes here as we go through this. Consistent
2 with the discussion that we had earlier with some of
3 the members, you know, as we go through here, and we
4 continue to comb through, we get additional staff
5 involved, we have interaction such as these today, we
6 do identify things and then decide on where to address
7 them.

8 So one of the areas was in the specific
9 design requirements. And we had a number of things
10 listed here before where we thought maybe the
11 methodology didn't address some important thing in the
12 design, or we needed more information. Fire
13 protection is an example that, in the previous
14 iteration, we got some general language, but we
15 sharpened that up a little bit based on internal
16 discussions.

17 One of the things that we added in this
18 section, in this iteration, is within Subpart F, this
19 is the second bullet, within Subpart F on programs, we
20 added a requirement for an integrity assessment
21 program. And this is to look for particular
22 degradation mechanisms like aging, fatigue, chemical
23 interactions, areas where the history of light water
24 reactors has shown that what was put in place in the
25 early days may have needed to be supplemented.

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1 And it was through various regulatory
2 requirements, through inclusion in programs, or codes
3 like the ASME, or in programs where NRC and industry
4 reached agreement and things were taken care of, but
5 maybe the rules weren't changed.

6 And one area that falls into that category
7 is for both BWRs and PWRs, some of the stress erosion
8 cracking concerns associated with either reactor
9 vessel internals or steam generators. Programs were
10 put in place to address those kind of degradation
11 mechanisms. And whether a rule was changed or not,
12 the NRC had assurance that that was being addressed.

13 In this particular case, since we added a
14 requirement in Subpart F that degradation mechanisms
15 be addressed during operations by having a monitoring
16 program, we thought it appropriate to put some onus on
17 the designers as well to support the identification of
18 possible mechanisms and then to help develop whatever
19 monitoring program was going to be put in place to
20 make sure that, if something unexpected did happen,
21 that it would be caught as early as possible. So
22 that's the second bullet.

23 As I mentioned, we sharpened up the fire
24 protection language. And then I highlighted
25 Paragraphs G and H in this iteration, because they go

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1 to discussions we've had internally as well as with
2 the subcommittee, in that they are specific
3 requirements for the reactor and waste stores to
4 maintain sub-critical conditions and long term
5 cooling.

6 And so the reason we add a specific
7 requirement is when we look at how the analysis is
8 expected to get done, and we had this discussion, I
9 think, maybe last time, the actual analysis might run
10 to a safe, stable condition.

11 And in some reactor designs, as far as I
12 run the event analysis that safe stable condition
13 could still be critical if it's based on inherent
14 feedback such that I reach a new equilibrium and it's
15 safe and stable.

16 But that brought in the possibility of
17 this gap that we talked about before. And so we added
18 Paragraph G to specifically say, if you're going to
19 run an event and stop your analysis at safe and
20 stable, you have to show that you are able to reach a
21 subcritical condition as an extra, as an added
22 requirement that might follow after the end point of
23 the analysis. And likewise for long-term cooling.

24 So in cooling, as an example, 50.46 for
25 the ECCS rule includes long-term cooling as a

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1 requirement. Traditionally, I'll date myself going
2 way back, the local codes, the ECCS codes, would be
3 run out and then long-term cooling was assessed, kind
4 of not using the evaluation model, but using another
5 engineering review to make sure that long-term cooling
6 could be established and maintained. So these
7 requirements for subcriticality in Paragraphs G and H
8 would have the same effect.

9 If a designer were to argue that the
10 analysis ends its safe and stable, we would go one
11 step further and say, you still need to show that you
12 can reach a subcritical and long-term cooling
13 configuration as an add on to your actual event
14 analysis.

15 And then Item I was just added to
16 reinforce that under Part 53, the nuclear plant is,
17 all of the analyses are being done on a plant basis,
18 which includes all the units and all of the
19 inventories.

20 So we can go on then to the next.

21 MEMBER MARCH-LEUBA: Hey, Bill, let me ask
22 you this.

23 MR. RECKLEY: Ah, there we go. I was
24 expecting something on that slide.

25 MEMBER MARCH-LEUBA: Okay.

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1 MR. RECKLEY: If we can go back to Slide
2 29.

3 MEMBER MARCH-LEUBA: Did you define safe
4 stable?

5 MR. RECKLEY: Safe stable, and I'll look
6 to Marty, is a defined term. And our plan would be to
7 use the discussion of that that comes out of the non-
8 light water reactor PRA standard. The ANS-ASME joint
9 standard.

10 MEMBER MARCH-LEUBA: Which can do, I'm not
11 familiar with. I try to stay away from PRA myself.
12 And tell me what it says? Paraphrase.

13 MR. RECKLEY: Yes, I'll look, Marty?

14 MEMBER MARCH-LEUBA: The real question is,
15 if you have a condition which is slowly degraded but
16 it hasn't gotten bad yet after 72 hours in your
17 calculation, is that safe and stable?

18 For example, this, it clearly oriented to
19 reactors that want to overheat their fuel to get
20 feedback, and not achieving k effective 1 that's
21 slightly below it. That temperature, you can almost
22 say that temperature is achieved, but it will
23 eventually want to cool. It might take 32 hours, it
24 might take 32 days.

25 So in the statement concentration, you

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1 need to define what you mean by safe stable.

2 And also, you should really define what
3 you mean by this mysterious backup system that makes
4 the system subcritical afterwards. How it's defined,
5 how it's described. Is it in the reliability program
6 or it's just a pinky promise, we'll have something?

7 MR. RECKLEY: Oh, yes. It wouldn't be the
8 latter. The thought is however that it could be a
9 non-safety related system.

10 MEMBER MARCH-LEUBA: Oh, it would be a
11 non-safety related system. You design it like that.
12 Okay. Let's be honest.

13 If the rule permits it to be a non-safety
14 related system to evaluate whether the rule is
15 acceptable, you have to show me it's non-safety
16 related. Otherwise the rules should say it has to be
17 safety related.

18 MR. RECKLEY: No. Yes. Yes, I wouldn't
19 argue that point. It will be a conscious decision,
20 and we'll have to talk about that in the context of
21 the rule and what it's allowing.

22 MEMBER MARCH-LEUBA: Yes. And then you
23 mentioned ECCS earlier. I mean, one rule you do
24 include is the requirement, Part 50 has a requirement
25 to have a highly reliable I&C system and a protection

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1 system. And we don't have that anymore.

2 Because if an inherent feedback gets you
3 to 2,000 degrees, but k effective of .999, you don't
4 need a protection system.

5 MR. RECKLEY: Well, it would depend on the
6 design. I'll say, I will say --

7 MEMBER MARCH-LEUBA: Now, let me, before
8 you go on.

9 MR. RECKLEY: Yes.

10 MEMBER MARCH-LEUBA: If it will depend on
11 the design, that means that the rule allows it. And
12 if the rule allows is, when I judge the rule I have to
13 assume the worst. I have to assume what your rule
14 allows a bad designer to do, not what the good
15 designer is likely to do.

16 MR. RECKLEY: Yes.

17 MEMBER MARCH-LEUBA: I mean when the
18 Department of Transportation puts a speed limit of 55
19 miles per hour on the road it doesn't mean, but if you
20 have a good Mercedes with good brakes you can go 75,
21 just you go 55.

22 Anyway, you know where I'm coming and you
23 know --

24 MR. RECKLEY: Yes.

25 MEMBER MARCH-LEUBA: -- my feelings about

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1 this.

2 MR. RECKLEY: Yes. Right.

3 MEMBER MARCH-LEUBA: But you need to
4 define safe and stable if you want to take credit for
5 it.

6 MR. RECKLEY: Yes. Yes, we will, we'll
7 define those terms as we're using them here.

8 And then, again, a same caution that I did
9 at the last stakeholder meeting is, in terms of what
10 the rule allows, the design as it comes forward, the
11 combination of the rule and the design will dictate
12 the results.

13 An example of that is, at least to what
14 we've seen to date, any reactor that is in the
15 hundreds of megawatts is going to have a safety
16 related protection system. Because you need it in
17 order to meet the criteria. And everything we've seen
18 has shown that.

19 Much of the discussions of what this will
20 allow goes to the concepts of smaller designs that
21 might rely more on inherent features. And the rule,
22 if they can show it, might allow some of that.

23 So I take your point, Jose, that the
24 burden will be on them to show that. But we would not
25 expect to see the rule resulting in dramatically

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1 different acceptance for those that have traditionally
2 been looked at. And those are the ones that --

3 MEMBER MARCH-LEUBA: No. And, Bill --

4 MR. RECKLEY: -- in the hundreds of
5 megawatts.

6 MEMBER MARCH-LEUBA: You realize people
7 talking about building reactors that will be loaded on
8 a helicopter and parachute dropped in the middle of
9 Alaska. Maybe exaggerated a little bit, but the rules
10 should not allow you to parachute drop a reactor
11 without operators in the middle of Alaska.

12 MR. RECKLEY: Yes. And I know --

13 (Simultaneous speaking.)

14 MEMBER MARCH-LEUBA: -- with that.

15 MR. RECKLEY: Those are the conceptual
16 ones that I was talking about. They're very small.

17 MEMBER MARCH-LEUBA: Yes.

18 MR. RECKLEY: And we'll just, we'll have
19 to see as they're developed and as the safety case is
20 presented for them, how that might play out. Okay.
21 I say --

22 MEMBER MARCH-LEUBA: But my, let me
23 finish, I promise, 30 seconds.

24 MR. RECKLEY: Go ahead.

25 MEMBER MARCH-LEUBA: My philosophy is

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1 there is an exception process in every rule. The
2 rules should provide the general design principles
3 that are the best designed practices.

4 I would expect you to have a protection
5 system and operators. Now, you have a special
6 consideration where you can be exempt from that, as
7 for an exemption. Don't build exception on the rule
8 just because somebody might ask for it. And I'm done.
9 Thank you very much.

10 MR. RECKLEY: Okay. I see other hands.

11 CHAIR PETTI: Joy, go ahead.

12 MEMBER REMPE: Yes, I'm unmuted now.
13 Okay, so, I waited till now to ask this question or
14 make another repeat plea.

15 You talked about, well, we didn't add
16 reactivity at the beginning because it was a such as.
17 But then the next figure has, reactivity control,
18 reactivity/heat generation. That would have made me
19 happy.

20 And here you have maintained subcritical
21 conditions and cooling. You don't just say maintain
22 cooling.

23 I think you need to put reactivity up
24 front to just be very clear and very consistent.
25 That's been an important aspect.

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1 And if we have some of these reactors
2 returning to criticality in longer term, they're not
3 generating much heat, it's more that we don't want
4 them to be going back to criticality when they're
5 shutdown. So what was, other than it was a such was,
6 well, you have other things that are such as.

7 Was there some real reason to not put it
8 up front?

9 MR. RECKLEY: We'll look at that again.
10 One of the problems, and I hope you're sympathetic, is
11 we worked on this a couple of months ago. And I have
12 to go back and think and look at our records as to
13 what our logic was, but we'll rethink it.

14 And again, I come back, give it's a such
15 as, there is no harm in adding it. So --

16 MEMBER REMPE: Okay. Well, anyway, it's
17 one number, but I just don't get why not to put it up
18 front. I like the figure --

19 MR. RECKLEY: And I --

20 MEMBER REMPE: -- later.

21 MR. RECKLEY: Okay. All right. And I
22 don't remember. So, yes, we'll re-look at it. It
23 really wouldn't, and I understand the feeling in
24 retrospect. I don't think we, there is no problem in
25 adding it, I don't think, so we'll look at that again.

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1 I'll look at my notes. So thank you.

2 MEMBER BROWN: Bill?

3 MR. RECKLEY: Yes.

4 MEMBER BROWN: The safe stable, you say
5 Paragraphs G and H are 440 and I don't find, and this
6 is in Part C, right?

7 And I don't see the safe stable in the
8 actual Part C words in the documents that we were
9 given to look at. Other than in the discussion side,
10 not the read side.

11 And 53.40, 440 flips to 450 and then flips
12 to 53.220 under Part C. Did the documents get messed
13 up somehow? I can't find the words is the problem in
14 Part --

15 MR. RECKLEY: Yes. And it's currently in
16 Paragraph F, which says, when you're analyzing design-
17 basis accidents, they need to reach a safe stable end
18 state.

19 MEMBER BROWN: Is that in Part D or C?

20 MR. RECKLEY: C, 450 f. But that's for
21 design-basis accidents. They have to reach a safe
22 stable end state. For --

23 MEMBER BROWN: So I just key worded that
24 and I did not get --

25 MR. RECKLEY: Oh, okay. Yes.

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1 MEMBER BROWN: This is 450 f you said?

2 MR. RECKLEY: Yes.

3 MEMBER BROWN: I was just trying to get
4 the whole word in there.

5 MR. RECKLEY: Right.

6 MEMBER BROWN: Yes, okay. But it says
7 53.250 not 450.

8 MR. RECKLEY: Oh.

9 MEMBER BROWN: And it's under Part C, not
10 part, it's on Page 17 of the document and we're, right
11 now we were talking about Page 14.

12 CHAIR PETTI: 14.

13 MEMBER HALNON: Charlie, I'm seeing g and
14 h. It's got what he's saying, 440 g and h.

15 MEMBER BROWN: Yes, but it doesn't say,
16 that's over in the discussion paragraph.

17 MEMBER HALNON: Well, it says a system, a
18 commercial nuclear plant must be capable of achieving
19 and maintaining a subcritical condition during normal
20 operations in following any license basis events
21 identified.

22 And then h is similar, only it says,
23 capability to provide long-term cooling for the
24 reactor --

25 MEMBER BROWN: I'm just saying the safe

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1 stable words are not in --

2 MEMBER HALNON: Oh, the safe stable.

3 Okay, I got you.

4 MEMBER BROWN: -- are not in g and h.

5 MEMBER HALNON: Yes.

6 MEMBER BROWN: Now it says, in accordance
7 with 53.240, and then if I flip a couple of pages
8 there is something in 53.250 about that. I was just,
9 it was inconsistent because all a sudden I flip to 53,
10 I'm back into the 53.200s which were under Part B.
11 And then I got to 53.460.

12 So I didn't recognize that when I was
13 looking at it before. That's on Page 18, we're back
14 to 460 again. So there's a segue back to 53.200
15 whatever it is as we're going from 440 to 450 and then
16 we're back into the 253s or the 250s.

17 Anyway, it just seems to be it's
18 something, but I did not see the words, like you say,
19 under, Greg, they're not under the 440, they're only
20 in the discussion paragraph.

21 MEMBER HALNON: And I --

22 CHAIR PETTI: 250 f has safe stable
23 instate.

24 MEMBER BROWN: That's right. But that's
25 on page --

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1 CHAIR PETTI: Right.

2 MEMBER BROWN: -- it's under Part B, not
3 Part C. 53.250 is not a part of Part C, if I'm not
4 mistaken. Because we go right back into the 400s next
5 on Page 18. It's an organizational thing.

6 MR. RECKLEY: Yes. And I'll, yes, we'll
7 take a look. I mean, it is a disintegrated thing so
8 it's very hard. We tried to build it again from
9 higher to lower but it is hard to keep from referring
10 back and forth.

11 But again, under the design requirements,
12 440, we added, the point here on the slide is, we
13 added specific requirements that for normal ops and
14 following any licensing basis event that that it needs
15 to be able to achieve and maintain subcriticality and
16 long-term cooling.

17 Part of the confusion is then, in terms of
18 instate discussions, that's really an analytical term
19 and so it shows up in 450 under the analysis saying
20 that for licensing basis events you have to basically
21 analyze all the licensing basis events to an instate
22 and for design-basis accidents it has to be a safe
23 stable instate.

24 That simply for FLEX, that in an PRA an
25 instate for the very unlikely events might very well

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1 be a bad outcome. That's the nature of the PRA
2 analysis. So it would reach an instate, but within
3 the PRA analysis it could be a bad circumstance.

4 And so, as maybe as we get in to 450, if
5 there is additional questions.

6 MEMBER HALNON: That number you're looking
7 at the top of the page where it says, 53.220 and
8 53.250, that's a part of the narrative under Echo, 450
9 e. That's not a new paragraph.

10 MEMBER BROWN: No, I just realized that.
11 The way it tracked through the page, I've lost the
12 bubble on that, but it's still, the safe instate is
13 not under g and h.

14 MEMBER HALNON: No, it's under the f,
15 Frank.

16 CHAIR PETTI: Right. It's under 450.

17 MEMBER BROWN: Yes. And it's okay, I just
18 --

19 MR. RECKLEY: Okay.

20 MEMBER BROWN: -- we just seem to be out
21 of whack relative to where we say stuff is.

22 MR. RECKLEY: Right.

23 MEMBER BROWN: I apologize for the
24 confusion, but --

25 MR. RECKLEY: No.

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1 MEMBER BROWN: -- it's a trouble of going
2 back and actually reading the words as opposed to the
3 slides. I'm not criticizing --

4 MR. RECKLEY: Right.

5 MEMBER BROWN: -- the way you're trying to
6 track through this it's a --

7 MR. RECKLEY: A challenge. Yes.

8 MEMBER BROWN: All right. I'm sorry about
9 that.

10 MR. RECKLEY: Okay. No, no. No, no
11 problem.

12 MEMBER BROWN: It's really in 450 is where
13 the safe stable instate is.

14 MR. RECKLEY: Right. Right.

15 MEMBER BROWN: Okay.

16 MR. RECKLEY: So, we can go on then to
17 Slide 30 and talk about the changes in this iteration
18 of 450. And again, 450 becomes a, it's a very
19 important section because it's talking about all of
20 the analyses that are done just to make the safety
21 case.

22 So there were some --

23 MEMBER BROWN: Bill?

24 MR. RECKLEY: Yes. I'm looking at the
25 slide now and I'm lost, so let me see.

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1 MEMBER BROWN: I just, this gets back to,
2 the information is in there, but why wouldn't a nice
3 general design criteria that says you need to achieve
4 a nice safe stable instate with the subcritical
5 operation instead of sprinkling it around in the, just
6 burying it in the, that's the wrong words --

7 MR. RECKLEY: Yes. No, I understand. No,
8 I understand.

9 MEMBER BROWN: It's just --

10 MR. RECKLEY: So you --

11 MEMBER BROWN: -- some of these high level
12 general design criteria are showing up, but they're
13 not, you got to fish through the document to find out
14 what they are, whereas in Part 50 you can see where
15 they are and then the implementation is in places like
16 this.

17 MR. RECKLEY: Right. Okay.

18 MEMBER BROWN: Apologize for my own
19 confusion.

20 MR. RECKLEY: No, that's fine. So Slide
21 30, looking at the changes to 450. Just some
22 editorial changes.

23 Probably the most important thing is, we
24 maintain the requirement in 450, in Paragraph A in
25 particular, to do a probabilistic risk assessment. A

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1 change that was made was, we removed degradation
2 mechanisms from something you get out of the PRA. And
3 we added additional requirements in other places to
4 make sure that degradation mechanisms were looked for
5 and addressed and monitored for.

6 But the comment was that the PRA, in and
7 of itself, doesn't identify degradation mechanisms.
8 So that was that change. Largely editorial.

9 The other change in 450 is within
10 Paragraph E. One thing that we had lacked in the
11 previous iterations was a requirement to define
12 evaluation criteria for a specific events.

13 Subpart B has the criteria that the
14 licensing basis events, other than the design-basis
15 accident, need to ensure you meet the accumulative
16 risk measure. But we didn't have a requirement that
17 for each event it has its own event criteria.

18 And so, that was an oversight. And so we
19 put in Paragraph E, that for every event you need to
20 identify an evaluation criteria.

21 That could be a barrier, integrity type
22 criteria, or it could be a frequency consequence
23 target figure type criteria. Or it could be a
24 combination of the two.

25 Under the licensing modernization it's the

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1 frequency consequence target figure. But a lot of
2 discussions over time.

3 And associated with NEI 18-04 in Reg Guide
4 1.223 has been the easiest way to show you meet the
5 frequency consequence target, is to show that you
6 maintain the integrity of, in particular, the first
7 barrier. And so, the analysis, even under NEI 18-04
8 could support that kind of approach.

9 But the requirement that we added was to
10 make sure that for each event, or each event category,
11 that an acceptance criteria be defined.

12 The second thing that we added, and this
13 will become evident when we talk about Subpart I this
14 afternoon, was a requirement that they have within
15 their methodology a way to identify risk significant
16 event sequences. Or risk significant events.

17 That was in addition, because as we were
18 developing change control mechanisms, we wanted to
19 take advantage of such a designation in our decision,
20 or in the criteria, for when a license amendment would
21 be required. So this is just an example as we're
22 working on future subsection, or future subparts, that
23 need to go back and look and make sure that we can
24 support it by the requirements in an earlier subpart.

25 So this changed to Subpart B came directly

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1 from our development of Subpart I.

2 But within the licensing modernization
3 that we talked about last time, this is satisfied by
4 the area, oh, actually I'll show it in a slide or two
5 so no reason to discuss it on this slide.

6 Let's go to the next couple of slides.
7 These are ones we've used before in our meetings. So,
8 again, going back to needing to identify an evaluation
9 criteria for each event, this is the slide I've used
10 many times before.

11 Basically showing that ultimately the
12 success of the system can rely on one barrier or
13 multiple barriers. And so, the requirement under
14 Subpart C to come up with an evaluation criteria could
15 reflect either approach.

16 Either the integrity of a particular
17 barrier could prevent a release or something like a
18 frequency consequence target figure where for various
19 event sequences you might credit multiple barriers.
20 And that's reflected on the next slide, 32.

21 Which is the figure from SECY 1896, the
22 functional containment paper. Which shows the same
23 thing.

24 That for example, when you look at
25 anticipated events, or anticipated operational events,

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1 the plant level performance criteria could either be
2 a frequency consequence target or a fuel design limit.
3 And likewise, design-basis events could be a frequency
4 consequence assessment or an assessment of particular
5 barriers.

6 So, just kind of bringing up that
7 assessment. Those discussions we had back when we
8 were, I know that's now three years ago or four years
9 ago when we talked to the ACRS about this, but same
10 principles were on the same basic process of looking
11 at event categories, event sequences and coming up
12 with plant level performance criteria.

13 So, the last slide in this discussion,
14 Slide 33, is the one I started to allude to. Under
15 the licensing modernization, NEI 18-04, this risk
16 significant category is this hatched area. And it's
17 basically an area defined as two orders of magnitude
18 or one percent of the frequency consequence target
19 line.

20 And so the requirement would be, for any
21 applicant to describe how their methodology provides
22 something akin to this hatched area. Something that
23 said, a particular event sequence is a risk
24 significant event sequence so that it can result in
25 additional attention by both the applicant and by the

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1 NRC Staff. So that is the change to 450 on the
2 analysis.

3 MEMBER MARCH-LEUBA: Bill, this is Jose
4 again. From the point of your philosophy, from high
5 level thinking, you keep saying, it may, it could be,
6 I don't know, we'll see when we receive the, but our
7 rules should be specific. I mean, you should have a
8 speed limit, be it 55 or 75 or 90, whatever you want
9 to make it.

10 But you keep talking as if you don't know
11 how the rule will be implemented.

12 MR. RECKLEY: No.

13 MEMBER MARCH-LEUBA: If I'm not expert,
14 how do I know what I need to do?

15 MR. RECKLEY: Well, I would say the rule
16 language is going to be written, is being written to
17 support the probabilistic approach. We have not put
18 in the rule the specific frequency consequence figure.

19 Although we're on the record under Reg
20 Guide 1233 and the rulemaking plan for Part 53 to see,
21 LMP is unacceptable approach to this. But we did not
22 put in the specifics.

23 In light of, that there are different ways
24 that this could be done, and although this is one way,
25 there are different even risked informed ways to

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1 develop a target figure.

2 And so, we're open to somebody proposing
3 an alternative to NEI 18-04 and a different frequency
4 consequence target. But the general notion is that
5 the rule will be written in those kind of terms.

6 How an applicant meets it, if you go back
7 up, Billy, if you can go back up to Slide 31. So the
8 rule will ultimately be written in the terms of the
9 atmospheric dispersion because in the end what
10 presents a risk to the public health and safety is the
11 release of a radionuclide. Or radionuclides.

12 However, although the rule is written that
13 way, you can demonstrate you meet the rule by showing
14 the radionuclides don't get by the first barrier. So
15 that's a flexibility that's built in to the rule.

16 So there is, you know, the speed limit can
17 be 55, and I can control that through the gas pedal or
18 I can put the gearing in to make sure the vehicle
19 doesn't go above 55. How you meet the 55, we're
20 providing some flexibility.

21 MEMBER MARCH-LEUBA: Is your statement
22 completely compatible to something you said an hour
23 again about defense-in-depth that not a single system
24 can be used to satisfy the safety goals?

25 MR. RECKLEY: We --

1 MEMBER MARCH-LEUBA: So you said the
2 barrier one doesn't let iodine through, I'm done,
3 would that be okay?

4 MR. RECKLEY: Not if the only thing you're
5 relying on is barrier one.

6 MEMBER MARCH-LEUBA: But you just said
7 that.

8 MR. RECKLEY: Well, but we have another
9 requirement for defense-in-depth that says, if the way
10 I'm meeting the QHO is totally relying on barrier one,
11 then you have to do more.

12 MEMBER MARCH-LEUBA: Okay. It doesn't
13 take the frame of mind when you talk.

14 CHAIR PETTI: Yes. So, Bill --

15 MEMBER MARCH-LEUBA: Okay, you show what
16 you're thinking.

17 CHAIR PETTI: Bill, but let me see if I,
18 the way I interpreted what you said is, okay, you have
19 an event sequence and barrier one still maintains its
20 integrity so that there is no release. And so, the
21 analyst of an applicant says, that sequence is okay,
22 I don't need to go all the way to the FC curb because
23 my acceptance criteria remained intact.

24 But, I also have barrier two, three and
25 four, as you show here so I still have defense-in-

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1 depth. But I just didn't talk about it in that
2 sequence because those weren't challenged in that
3 sequence. They may be challenged in other sequences.

4 MR. RECKLEY: They may be challenged in
5 other sequences. And when I assess defense-in-depth
6 for that sequence, I'll say I have barriers two, three
7 and four.

8 CHAIR PETTI: Right.

9 MEMBER MARCH-LEUBA: Yes, but you will not
10 --

11 CHAIR PETTI: To me the --

12 MEMBER MARCH-LEUBA: But you will not
13 perform a calculation for barrier two to the term,
14 efficient effective, because you said it maybe it came
15 out to one.

16 MR. RECKLEY: But the defense-in-depth --

17 MEMBER MARCH-LEUBA: And that's where the
18 single failure criteria come along. You have to say,
19 look at the problem and say what is the worst thing
20 that can possible happen to me.

21 In this case it would be barrier one
22 breaks out. Then do the analyst. What you're saying
23 is, barrier one won't let anything out so I don't have
24 to any analysis for two, three and four. I can design
25 the weak, I can design them so that they can be

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1 breached under certain circumstances.

2 I don't know. You guys need to think this

3 --

4 CHAIR PETTI: No, no, no. Jose? Jose,
5 you're misconstruing. Because there are sequences
6 where barrier one fails and then you have to rely on
7 barrier two and barrier three, or barrier four.
8 Depends on the sequence. They're all in there.

9 MR. RECKLEY: Right.

10 CHAIR PETTI: In this approach. So you
11 can't, yes, you can't look at any specific sequence
12 when you look at the whole picture, right?

13 I mean, come on, these scenarios in
14 existing light water reactors where you never breach
15 the primary system, you're done. It's an event but
16 it's not a big event.

17 MEMBER MARCH-LEUBA: In part --

18 CHAIR PETTI: And those others will --

19 (Simultaneous speaking.)

20 MEMBER MARCH-LEUBA: In part --

21 CHAIR PETTI: -- right?

22 MEMBER MARCH-LEUBA: In Part 50, design
23 criteria for anticipated occurrences, thou shall not
24 breach the first barrier until this for sure will
25 remain intact. It is a requirement not to breach the

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1 first barrier.

2 You remove that for anticipated
3 occurrences. That bothers me. We've operated these
4 reactors for 60 year safely, and suddenly we are
5 relaxing the requirements.

6 MR. RECKLEY: And like I --

7 MEMBER MARCH-LEUBA: For better reactors.
8 I mean, the reactor you're designing now are better
9 than the ones that we're operating. You don't need to
10 relax the requirement.

11 MR. RECKLEY: Yes. And I guess the delta
12 would be coming, where it's characterized as a
13 relaxation in requirements because I don't,
14 personally, I don't view it as a relaxation in the
15 requirements.

16 It's a different way to do the design and
17 assessment. But it's not a relaxation in terms of,
18 ultimately our goal is to limit the release of
19 radionuclides.

20 The way that has historically been done,
21 and it's for a variety of reasons for light water
22 reactors, has been a very barrier based system. I
23 will, for certain events, show that the first
24 barriers, the cladding, is maintained.

25 For another set of events I'll make sure

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1 that the reactor coolant pressure boundary is
2 maintained. For another set of events, I'll look and
3 make sure that the containment will contain whatever
4 radionuclides might come out of a significant event.

5 That's the way that was evolved. And
6 plenty of reasons. And I'm not arguing that it has
7 not been an effective way to address it.

8 But the alternative is not less safe.
9 It's going to provide the same ultimate protection to
10 the public from the release of radionuclides.

11 What it may relax, and again, I'm going to
12 be careful about the term, but I'll say it, it might
13 be viewed as a relaxation, is that the development of,
14 let's say anticipated operational occurrences, from
15 the early days had one measure, for example, that the
16 plant could restart following an AAO.

17 We fully expect that that will be the
18 expectation. But if you use the frequency consequence
19 target, a frequency consequence assessment type
20 approach, you don't inherently have in it a
21 requirement that the plant be able to restart
22 following an anticipated operational occurrence.

23 We're fully, I'll use first person. I'm
24 confident that other factors, other than our
25 regulations, would provide ample incentive that a

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1 designer is not going to want to design a plant that,
2 for an anticipated operational occurrence, you meet
3 the frequency consequence type criteria, but you're
4 unable to start up the plant following the event.

5 That becomes an economic incentive. It
6 becomes other things. So in that light one might
7 characterize it as a relaxation. Because we move it
8 from something needed for public health and safety to
9 something that a designer better address or they're
10 not going to have a practical design.

11 But in terms of ultimately, the protection
12 of public health and safety, there is no relaxations
13 under this. I don't believe there is a relaxation
14 under this Part 53 construct.

15 MEMBER MARCH-LEUBA: I do, but --

16 MR. RECKLEY: Okay.

17 MEMBER MARCH-LEUBA: -- as I said before,
18 I'm just hoping you can give you an example of a
19 particular reactor that needed to access that AAO
20 requirement. Okay, keep going. It's probably
21 lunchtime.

22 MR. RECKLEY: Okay. All right. So we'll
23 go down to finish out Subpart C, on Slide 34.

24 So these we just highlight because we
25 didn't really, in the third iteration, make changes

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1 from the second iteration. And those are the ones
2 that are related to safety categorization and special
3 treatment.

4 The application of analytical safety
5 margins, this is again, the adoption of a more
6 restrictive criteria in order to justify an
7 operational flexibility. And so the example is
8 establishing for the unlikely and highly unlikely
9 events, a design goal of one rem versus the higher
10 ones that might be shown in a frequency consequence.

11 And then saying, based on the fact that
12 none of my event sequences exceed one rem, 96 hours or
13 over a month, whatever your time frame, I can then use
14 that flexibility, that margin, to have a flexibility
15 in emergency planning or flexibility in sighting or
16 flexibility in staffing, as we'll discuss later.

17 We didn't change the quality assurance
18 requirements for the design. And we maintain the
19 design and analytical interfaces. So.

20 So that is the second, I mean, the third
21 iteration of Subpart C. And I guess the next slide,
22 Billy, is just a discussion slide.

23 MEMBER MARCH-LEUBA: Hey, Bill, this might
24 be a little bit of a tangent, but you discuss the
25 emergency planning zones. So what you're saying if,

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1 if the calculated numbers are below one rem and the
2 EPZ is inside the side boundary, what, is Part 53
3 completely silent on that, does it rely on other
4 guides?

5 MR. RECKLEY: Well --

6 MEMBER MARCH-LEUBA: Can you talk about
7 that?

8 MR. RECKLEY: Yes. The way we see that
9 working is that the criteria itself is within the
10 existing EP SMR rule. And so we would be relying on
11 that rulemaking to say that a designer, an applicant
12 can, if they can show that the dose is less than a
13 criteria, which is the one rem over 96 hours, at a
14 given distance, then that distance is the emergency
15 planning zone.

16 So if it's at the, let's say it's at the
17 exclusionary boundary, then the exclusionary boundary
18 and the emergency planning zone would be the same --

19 MEMBER MARCH-LEUBA: But Part 53 is silent
20 --

21 MR. RECKLEY: -- boundaries.

22 MEMBER MARCH-LEUBA: -- Part 53 is silent
23 on these.

24 MR. RECKLEY: No.

25 MEMBER MARCH-LEUBA: It would rely on

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1 existing regulations.

2 MR. RECKLEY: Right. Except that the
3 relationship within Part 53 is, the calculation of
4 that dose is coming out the evaluation of the
5 licensing basis events.

6 And we've built in this provision in 470
7 that says specifically, when you're evaluating your
8 licensing basis events, you can establish a criteria
9 in like the one rem for emergency planning to use in
10 place of the, something like the frequency consequence
11 target figure out of NEI 18-04.

12 And then the other thing that's achieved
13 by doing that is, once that's integrated into your
14 licensing basis analysis, all the future updating,
15 maintenance, tests that would be done under Subpart I
16 for evaluating whether an amendment would be needing,
17 all of those things are integrated such that it's now
18 built in. And the fact that you're doing that,
19 justifying a lower emergency planning zone, becomes
20 integrated into your whole licensing case, your whole
21 safety case, the whole need to update, maintain and
22 evaluate plant changes.

23 MEMBER MARCH-LEUBA: Boy, you're making
24 everything complicated. So basically you would
25 restrict a failure criteria from 25 to one rem --

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1 MR. RECKLEY: Yes.

2 MEMBER MARCH-LEUBA: -- if you don't want
3 to have an emergency planning outside your boundary?

4 And there's a way to enforce this for the
5 life of the plant?

6 MR. RECKLEY: That's right.

7 MEMBER MARCH-LEUBA: I'm afraid to say
8 tech specs again, but these aren't tech specs or is it
9 the licensing basis or --

10 MR. RECKLEY: Licensing basis and --

11 MEMBER MARCH-LEUBA: I'm sure the
12 inspectors won't let you get away with it if they --

13 MR. RECKLEY: Yes.

14 (Simultaneous speaking.)

15 MEMBER HALNON: Bill, let me help.
16 There's a requirement to keep your EPlan up to date
17 based on your licensing basis. So if you're licensing
18 basis changes --

19 MR. RECKLEY: Right.

20 MEMBER HALNON: -- the analysis going back
21 for your EPlan has to change.

22 MR. RECKLEY: Right. And when we get to
23 Subpart I, on the maintenance of the licensing basis,
24 we'll talk specifically about how we address this
25 particular item of emergency planning. Or any other

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1 flexibility that you're gaining by showing that you
2 achieved a lower consequence.

3 MEMBER HALNON: And I think Dave said it
4 yesterday, we'll be looking for the connectivity
5 between this --

6 MR. RECKLEY: Right.

7 MEMBER HALNON: -- 50.160, the source term
8 determination efforts going on and some other
9 activities. There's a lot going on and they all have
10 to --

11 MR. RECKLEY: Right.

12 MEMBER HALNON: -- a lot of them hinge on
13 this spec, "spectrum of accidents" that you have to
14 deal with.

15 MR. RECKLEY: Yes.

16 MEMBER HALNON: And we'll continue to look
17 at that.

18 MR. RECKLEY: Right. And I think a
19 meeting is getting setup in February, I believe, to
20 talk to you guys about that.

21 MEMBER REMPE: I'm kind of wondering now
22 about your, again, thoughts about not requiring, or
23 having less reliance on a PRA and how that
24 connectivity could be impacted. It's going to make it
25 more complicated, with what we heard yesterday in the

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1 discussion about the EP rule.

2 MR. RECKLEY: I would say we've been able
3 to integrate it here because we were developing them
4 in parallel. 50.160 it doesn't, it can accommodate
5 the more traditional approach for identifying events.

6 I mean, you're going to, most likely you
7 are going to do that through a probabilistic risk
8 assessment. But, or at least use the PRA as a
9 supporting tool in identifying sequences in showing
10 consequences are below the one rem.

11 That's what we've seen in exercises be it
12 the NuScale or, that would be the most recent example.
13 But they were able to do that within the Part 50 type
14 construct.

15 MEMBER REMPE: Yes, but I'm speaking about
16 a new design that thinks they're so safe they can go
17 with a hypothetical maximum critical event or
18 hypothetical event. And then how do we know they,
19 that maximum event is a low enough frequency and that
20 it's considered all of the appropriate challenges
21 without a PRA.

22 And we've let people get away without a
23 containment and now we're going to maybe get away
24 without having to do emergency planning. And it's
25 based on someone's assessment of a maximum critical

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1 event. It just seems like it's going to make things
2 a little more difficult to justify.

3 MR. RECKLEY: And the burden of proof
4 would be on them and the burden of making sure it's
5 true would be on us. But just because people talk
6 about it, my caution would be, that's a tall hurdle
7 that they've set for themselves. And they should be
8 prepared to testify that.

9 And the burden would be also on us to
10 review it and make sure that it actually was the
11 maximum hypothetical event.

12 MEMBER REMPE: And I like what you're
13 saying, I just hope it's written somewhere so the
14 Staff can rely on it to justify the question they'll
15 be asking when the design developers don't like those
16 questions. But anyway, that's --

17 MR. RECKLEY: Yes.

18 CHAIR PETTI: My view was, I don't have a
19 problem necessarily, per say, with an MHA approach.
20 It's the technical basis upon which the MHA is
21 selected that's critical.

22 And that kind of moves you into PRA space
23 to make sure that you use all the risk tools you can,
24 all the tools that are out there, to look at a broad
25 spectrum. Which goes back to our recommendation that

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1 you talked about this morning.

2 At some point you got to do a search. You
3 got to do a good thorough search. You just can't pick
4 it out of the air.

5 MEMBER REMPE: All of that is true. But
6 when you don't have data to have that technical basis,
7 it becomes more difficult with lots of uncertainties.
8 And then of course, how good is our imagination to
9 think of all of those events.

10 But that's true with any PRA also. But --

11 MR. RECKLEY: Well, and it's not only true
12 of any PRA, it's true of any new design no matter
13 which of the methodologies that you use.

14 And I would just go back to, we're not
15 guaranteeing anybody that this is easy. And the
16 technical requirements to show that your system is
17 going to be capable of delivering what it needs to
18 deliver, we're not proposing any significant
19 differences here.

20 The applicant needs to show, through
21 combination of analysis, operating experience, tests
22 and experiments, up to and including the operation of
23 a prototype plant, that it actually behaves as they
24 say it will behave.

25 And so that is, it's an underlying premise

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1 here. And yes, there may be uncertainties in how a
2 design is going to perform. So that results in
3 uncertainties in the analysis.

4 They have to be addressed through
5 experiments or operating experience or whatever.
6 We're not creating a path here, our view, we're not
7 creating a path here that a reactor can get a license
8 for commercial operation. And we don't have the same
9 level of comfort that we have now.

10 CHAIR PETTI: There is no EZ pass plan --

11 MR. RECKLEY: Yes.

12 CHAIR PETTI: -- is what you're saying,
13 right?

14 MR. RECKLEY: Yes. Yes.

15 (Laughter.)

16 CHAIR PETTI: Okay.

17 MR. RECKLEY: And if you have uncertainty
18 in one area, there is a number of ways you might
19 address it. But we're never saying is, we don't know
20 how this is going to behave, we'll just see as we go.

21 They're going to have to have something in
22 place that if there is a high certainty, a high
23 uncertainty, they're going to have to compensate for
24 that one way or another. So I see a hand up, I'm
25 sorry.

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1 CHAIR PETTI: Yes, Vesna.

2 MEMBER DIMITRIJEVIC: Yes. I would like
3 to comment on this because this is some part of the
4 discussion I also brought last time.

5 First I want to tell you, I really, you
6 know, I think that you getting off this two tier
7 structure is very good and moving in the right
8 direction there. So now I see the next step would be
9 to define this PRA, to split on the PRA having leading
10 role, and PRA having supporting role.

11 Something which I brought the last time we
12 have a discussion that is, when we say PRA, most of
13 the people who are not a PRA practitioner just think,
14 oh, frequencies are complex models, fault trees,
15 things like that. There is so much in the PRA than
16 that in numbers.

17 And therefore what the PRA brought to that
18 regulation, it is in so many areas which cannot be
19 neglected than if, you know, it's like a genie which
20 is out of the bottle. And it has to be respected in
21 many areas. Which don't have to be this complex and
22 huge model.

23 For example, a selection of the
24 challenging events, which is the part of the
25 initiating event PRA and misconducts has to be done

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1 for ever, how would we know what can damage the, you
2 know, and challenge the design if we know what
3 challenges present.

4 Also now, when we used to just talk about
5 challenges and now we talk about sequences, so logical
6 structures of that event trees is always there. What
7 is needed to mitigate those challenges.

8 So when we say the PRA is going to have a
9 supporting role, in my vision, that's not the role
10 that the applicant should select if he wants to do
11 some risk informed application or something where he
12 can choose not to use the PRA at all. That's not
13 possible anymore.

14 So therefore when you have a maximum
15 hypothetical technical accident, therefore main
16 principle, at least logical principle maybe with some
17 simplified quantification and frequencies can be, has
18 to be used to select that. How can we address
19 uncertainties if we don't think about, you know, the
20 PRA principles and uncertainties.

21 So, having PRA and supporting rule, it
22 doesn't mean no PRA, it just means it would play in
23 the different role and it will still have to be used
24 in a lot of the principles. In my vision.

25 MEMBER REMPE: I like your vision. And I

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1 hope that that gets conveyed in whatever the Staff's
2 thinking, Vesna.

3 MR. RECKLEY: Yes. The construct so far
4 is that whether it's in a leading role or a supporting
5 role, it's still required. Either under, under all
6 three parts. 50, 52 and 53.

7 50 is the current rulemaking to go back
8 and put in place what the Commission policy has been
9 ever since the development of 52. That a PRA would be
10 expected.

11 Albeit, again, it would be more in the
12 confirmatory role whereas under Part 53 these
13 iterations are that it plays a more prominent role in
14 both the design and the licensing arguments. So, and
15 --

16 MEMBER DIMITRIJEVIC: But for example, we
17 can keep the single failure criteria because that's a
18 pretty much agreeable to defense-in-depth and things.
19 But like other things, safety analyst, crediting all
20 these safety systems, not crediting human actions,
21 things like that, those are things which have to be
22 reconsidered given all of these things which we learn
23 in using PRA in regulations.

24 I mean, I just want to say, having
25 supporting role PRA will still be ready, be part of

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1 that. In my, I hope so.

2 MR. RECKLEY: Okay. Yes, I think we're --

3 CHAIR PETTI: We'll hear about that in
4 October, right, Bill?

5 MR. RECKLEY: Yes. Yes.

6 CHAIR PETTI: Yes. Well, I don't see any
7 more hands or any more questions, so we'll just a few
8 minutes ahead of our lunchtime, so why don't we break
9 then and we'll be back at 2:00 p.m. Eastern. Thank
10 you, all.

11 (Whereupon, the above-entitled matter went
12 off the record at 12:56 p.m. and resumed at 2:00 p.m.)

13 CHAIR PETTI: Okay. Welcome back
14 everyone. Bill, if you're there, we can resume our
15 meeting.

16 MS. VALLIERE: Actually Dave, this is Nan
17 Valliere from the Advanced Reactor Policy Branch in
18 NRR. And I'm going to be taking over for the first
19 topic this afternoon.

20 CHAIR PETTI: Great. Go ahead Nan.

21 MS. VALLIERE: Okay. Thank you. Libby,
22 you can go to slide 38. So, I'm going to provide an
23 overview of the first half of Subpart H of Part 53,
24 which was publically released in August.

25 As was mentioned earlier, this half covers

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1 the licensing processes for seeking limited work
2 authorizations, early site permits, standard design
3 approvals, and standard design certifications.

4 And as Bill noted, there's not a whole lot
5 that's new in this Subpart. Next slide, please Libby.

6 So, Slide 39 provides an overview of all
7 the licensing processes covered in Part 53. So, this
8 includes all the existing licensing processes in both
9 Parts 50 and 52.

10 It also provides some linkages between
11 processes that aren't currently laid out in the
12 existing regulations. And those are shown by the
13 dotted lines.

14 And I'm going to explain these new
15 linkages in more detail, in a few slides. Next slide,
16 please.

17 So, there are several issues within
18 Subpart H that related to items that are being
19 addressed in the ongoing lessons learned rulemaking
20 for Parts 50 and 52.

21 Full reconciliation between the two
22 rulemakings is going to occur at a later time, because
23 they are both in flux now. So, this first iteration
24 of Subpart H largely reflects the current version of
25 Parts 50 and 52.

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1 However, requirements for applications for
2 licenses and other approvals have been tailored to
3 match the Part 53 technical requirements.

4 As has been alluded to already, the
5 guidance being developed under the technology
6 inclusive content application project or TICAP, and
7 the advanced reactor content of application project or
8 ARCAP, will support Part 53 in this regard.

9 So, the first sections under Subpart H
10 that we're going to start to go over here, cover some
11 general application requirements. And these will be
12 shown on the next few slides.

13 So, Section 53.1100 provides the
14 equivalent of existing Section 50.30 for the general
15 administrative requirements for filing applications.

16 Section 53.1110 is the equivalent of 50.31
17 and 52.8. And that allows the combining of several
18 applications for different kinds of licenses into one
19 application.

20 Section 53.1120 is the equivalent of
21 existing section 50.32, and allows applicants to
22 incorporate by reference information contained in
23 previous applications or reports. Can we go to slide
24 41, please.

25 Section 53.1130 provides the equivalent of

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1 section 50.33 for general content information
2 applicable to all applications or certain types of
3 applications.

4 And I'll not that there are paragraphs on
5 emergency response plans, and both here and throughout
6 Subpart H, we will be updating those sections
7 following completion of the rulemaking on emergency
8 preparedness requirements for small modular reactors
9 and other new technologies.

10 Section 53.1135 provides the equivalent of
11 existing Section 50.36(b), which notes that certain
12 licenses may include conditions to address
13 environmental issues.

14 Section 53.1140 is the equivalent of
15 existing Section 50.37. And those requirements relate
16 to controls over restricted data in classified
17 national security information.

18 Section 53.1150 provides the equivalent of
19 Section 50.38. And covers restrictions related to
20 foreign owned, controlled, or dominated applicants.

21 And finally, Section 53.1160 is the
22 equivalent of Section 50.39. And that provides
23 provisions for public inspection of applications.
24 Slide 42, please Libby.

25 So, Section 53.1162 is a new section. And

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1 it's going to be populated in the next iteration of
2 Subpart H.

3 And it will include text from all the
4 existing Part 52 sections on the interrelationships
5 between those processes.

6 So, think of a combined license that's
7 able to reference either a design certification or an
8 ESP or both. And as well, this section will explain
9 relationships with the Part 50 licensing processes.

10 Section 53.1165 would provide the
11 equivalent of the site suitability review process.
12 That process is currently outlined in Part 50,
13 Appendix Q and Part 2, Subpart F.

14 And those requirements cover procedures
15 for NOC staff review and referral to the ACRS of
16 requests for early review of one or more site
17 suitability issues. And that would be prior to the
18 submittal of an application for either a construction
19 permit or a combined license.

20 This process has been around for a long
21 time. And it was the predecessor to the early site
22 permit process.

23 So, the staff has asked specifically for
24 stakeholder input as to whether this process should be
25 carried forward into Part 53. To my knowledge, it has

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1 not been widely used since the ESP process was
2 introduced.

3 And in Part 53, Section 53.1170, provides
4 the equivalent of the requirements in Section 50.10
5 for seeking a limited work authorization, or LWA.
6 It's worth noting that currently in Part 50, the
7 definition of the term construction is found in the
8 LWA rule.

9 However, in Part 53, this definition is
10 contained in the definition section of Subpart A. The
11 definition of construction helps to define the NRC's
12 regulatory boundaries.

13 And it's especially important in how we
14 implement our obligations under NEPA. So, we've
15 carried that definition forward as it exists. Just
16 put it in a new location in Part 53. Slide 43,
17 please.

18 This Section -- so, the Sections listed on
19 the bullet here show the Sections in Part 53 that
20 cover early site permits.

21 Again, these Sections are largely copied
22 from the existing Part 52 equivalent Sections. But,
23 I'll note a couple of items where we made adjustments
24 in Part 53.

25 In Section 53.1185, on the contents of

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1 applications for technical information, we've
2 introduced some new language to adapt the analysis
3 requirements for a Part 53 L&P like approach.

4 As explained on this slide, and also
5 included in the discussion table for this Section, the
6 phrase licensing basis events associated with
7 potential designs, is meant to acknowledge that an ESP
8 applicant maybe considering one or more designs in the
9 evaluation of its proposed site.

10 This is somewhat similar to the plant
11 parameter envelope concept that has been used by early
12 site permit applicants under Part 52.

13 Another item we noted in the discussion
14 table for this Section, was that we inadvertently left
15 out a QA requirement for citing related activities
16 when we issued the first iteration of Subpart D
17 earlier this year.

18 We will be adding a QA requirement for
19 citing in the next iteration of that Subpart. And the
20 need to submit a description of that QA program is
21 included here in Subpart H, just as it is in the
22 equivalent Section in Part 52. Slide 44, please.

23 Standard design approvals are covered next
24 in Subpart H in the Sections shown here on Slide 44.
25 Again, these Sections are largely copied from the

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1 existing Part 52 equivalent Sections.

2 The one area of new text to note is in the
3 Section 53.1225, which discusses the technical
4 information requirements for applications.

5 This Section contains the existing
6 discussion, which allows an applicant to seek a
7 standard design approval for a major portion of the
8 design rather than the complete design.

9 In addition, in Part 53, we've included
10 new text providing more guidance on the requirements
11 for the content of an application for a major portion
12 standard design approval.

13 The new text adds details for applicants
14 to provide information on interfaces with system
15 outside the scope of the major portion of the standard
16 design, and to define functional or physical boundary
17 conditions between the major portion of the standard
18 design and the remainder of the design.

19 And this information will help ensure that
20 the scope of the review of the major portion standard
21 design approval is clear to all parties involved.

22 Now, the last bullet on this slide cites
23 some references for more information on standard
24 design approvals and major portion review. And those
25 documents helped us form this additional language for

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1 Part 53.

2 And so this information is also included
3 in the discussion table for Subpart H.

4 CHAIR PETTI: So Nan?

5 MS. VALLIERE: Yes?

6 CHAIR PETTI: I have a question on this.
7 And it maybe because I don't know sort of a regulatory
8 standing of an SDA, of a part of the design.

9 You know, I think of a part of the design,
10 the systems are so tightly coupled, that one would
11 want to see accident analyses that include that part
12 of the design to assure that, you know, all the other
13 requirements are met.

14 Is that sort of done separate? And this,
15 does this provide finality if you approve a standard
16 design, a major portion of a standard design?

17 Or do you get to come back when it's fully
18 integrated and go oh, well, no. Hold it. No, it
19 doesn't meet those requirements because of this
20 problem in this component over here?

21 MS. VALLIERE: Yes. So, you're getting
22 directly to the reason why we felt it was important to
23 add some additional language here.

24 So, in a major portion design approval,
25 the idea is that the applicant would get finality for

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1 that portion of the design reviewed and approved in
2 the major portion application by the staff.

3 But, you know, your question gets to the
4 need to define these interface requirements. And to
5 ensure that the boundary, the boundaries for that
6 portion of the design for which approval is sought,
7 are clearly laid out in the application.

8 And, you know, the staff would be expected
9 to review that. And put any, you know, interface
10 requirements or conditions on things that would need
11 to be verified when the entire design was put
12 together.

13 So, I think the answer is yes, there is
14 finality for that portion. But, it's going to have to
15 be carefully spelled out in the design approval when
16 it's issued, what the boundaries of that finality are.

17 CHAIR PETTI: And so there could be a lot
18 of conditions because the staff hasn't seen certain
19 pieces.

20 MS. VALLIERE: There could be the need for
21 verification, yes, that --

22 CHAIR PETTI: Yeah.

23 MS. VALLIERE: That what the staff assumed
24 would be in the rest of the design was in fact there.

25 CHAIR PETTI: Yeah. Okay. Thank you.

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1 MS. VALLIERE: Sure. We can go onto slide
2 45. So, this slide lists the Sections that cover
3 design certifications and outline some of the
4 requirements for design certification applications.

5 And I will tell you that the requirements
6 for design certification and design approval are
7 nearly identical. Not 100 percent, but very close.

8 You'll see that the type of application
9 information required in Part 53 is similar to the type
10 of information required today in Part 52, but tailored
11 again, to the Part 53 process for developing the
12 licensing basis.

13 Some unique areas to point out include the
14 fact that there may be programmatic information to be
15 provided at the design certification stage, where
16 programmatic controls will be relied upon to support
17 assumptions made in the analysis used in the design.
18 Bill talked about this earlier this morning.

19 In addition, under the Part 53 process, an
20 applicant will need to describe the special treatment
21 it is assigning to equipment that is safety related
22 and non-safety related, but safety significant.

23 Also, as Bill discussed this morning, an
24 applicant seeking to use alternative safety criteria
25 to support operational flexibilities like a non-

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1 traditional emergency planning zone, we would expect
2 the safety analysis report to describe and identify
3 those alternative criteria, because obviously that
4 will be very important to the staff's review.

5 MEMBER HALNON: Nan, this is Greg. Where
6 is the review of the surrounding area or contiguous
7 non-nuclear industrial facilities?

8 Where does that occur?

9 MR. LUPOLD: Chapter Two.

10 MS. VALLIERE: So, somebody men -- I heard
11 somebody say Chapter Two. But, the chapters that are
12 being developed in the TICAP and ARCAP process don't
13 align 100 percent.

14 But, it would be in the equivalent to
15 where you would find it today.

16 MEMBER HALNON: Because that's probably
17 going to be more of a norm than a -- than not. I
18 mean, I think that a lot of these smaller advanced,
19 and small modular reactors are going to be putting --
20 be put on existing sites, or right in the center of
21 some other industrial facilities.

22 MS. VALLIERE: Yeah.

23 MEMBER HALNON: So, that to me, needs a
24 lot of visibility, and pretty hardcore review by the
25 staff.

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1 MS. VALLIERE: I would agree.

2 MEMBER BROWN: Where did you say that --
3 excuse me, this is Charlie. Where did you say that's
4 covered?

5 MS. VALLIERE: So, in a -- on a license
6 application, I believe it's covered in the -- in what
7 is the equivalent of Chapter Two today.

8 But, I know under the TICAP and ARCAP
9 process, the chapter numbers don't align with the SRP
10 today. So, I apologize at this point in time, I don't
11 have that restructure right in front of me.

12 MEMBER BROWN: So, we haven't seen that
13 yet is what you're telling me, right?

14 MS. VALLIERE: Right. Yes.

15 MEMBER BROWN: Okay.

16 MS. VALLIERE: Yeah, I believe you are --
17 you are meeting with that team later this year.

18 MEMBER BROWN: Oh, okay. I mean, and as
19 was said --

20 CHAIR PETTI: Yes, in December.

21 MEMBER BROWN: New licensing applications
22 surrounding areas were a large part of our review.
23 You know, train tracks, airports, --

24 MS. VALLIERE: Right.

25 MEMBER BROWN: Other -- other major

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1 industrial facilities. And there was a considerable
2 amount of analysis needed to work our way through.

3 I mean, it wasn't like it ended up being
4 a problem, but it was all a matter of maintaining an
5 inevitability in the control rooms and the surrounding
6 environments of the plant.

7 MS. VALLIERE: Right. Yes.

8 MEMBER HALNON: It's got huge EP
9 ramifications too, because much of the major places
10 have a more hazardous impact to the public than the
11 nuclear plant would have.

12 MEMBER BROWN: Absolutely. Yeah, there
13 was one where there was a major gas installation. My
14 memory is a little bit vague.

15 This was some years ago, that created a
16 lot of interest, because was a -- John Stetkar was
17 famous for finding all the flight lanes into various
18 airports around there and saying hold it, it's flying
19 right over this place. Which made it interesting.

20 MR. RECKLEY: Nan, this is Bill. Another
21 place they'll see this is when you get into the
22 siting.

23 Or if we went back up, a lot of this would
24 have been addressed in the siting parts of the
25 application.

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1 MEMBER BROWN: Yes. That's probably the
2 truth. I don't remember all that detail. It's been
3 a while.

4 MS. VALLIERE: Okay. So, I'll mention
5 here, another item as Bill discussed earlier, another
6 unique item is the need for the applicant to include
7 information about an integrity assessment program.

8 And again, this -- we're in the design
9 certification section here. So, this is a little
10 unique.

11 And as he noted, the addition of this
12 application requirement results from the addition in
13 the design requirements in Section 53.440 that came
14 out in this third iteration of the rule language for
15 Subpart C.

16 And that requirement addressed the need
17 for designers to evaluate and consider possible
18 degradation mechanisms like Bill mentioned, aging and
19 fatigue, and others. And how they could affect the
20 performance of either say safety related, or non-
21 safety related, but safety significant SSCs.

22 This information at the design
23 certification stage would help inform the development
24 of the integrity assessment programs that are required
25 in the operational program section of Subpart F.

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1 Again, this is somewhat analogous to the
2 design reliability assurance program for passive light
3 water reactors that was established under the Part 52
4 design certification process.

5 And in the discussion table we have
6 specifically sought stakeholder feedback on how to,
7 you know, appropriately balance requirements that
8 should be fulfilled at the design stage, and then the
9 consideration of performance-based approaches that
10 assess both design and monitoring requirements.

11 So, how do you split those
12 responsibilities between the designer and the ultimate
13 owner operator.

14 MEMBER HALNON: Does this have any -- any
15 comparisons in the maintenance rule for the existing
16 plants?

17 Is that similar?

18 MS. VALLIERE: So the -- there is a
19 separate maintenance rule program. So, this is --
20 this is a little bit different than that.

21 MEMBER HALNON: Okay.

22 MS. VALLIERE: Slide 46, please. So, on
23 slide 46 we note this new proposal that was
24 represented by the dotted lines on the figure I showed
25 at the beginning of Subpart H.

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1 And the new proposal is to allow a design
2 certification applicant to reference an issued opera
3 thing license or a custom combined license.

4 So, the staff's proposing that they --
5 that a design certification applicant be allowed to
6 leverage the staff's safety evaluation from an issued
7 operating or combined license in their design cert
8 application.

9 And to grant that safety review finality
10 like that provided for a license applicant referencing
11 a standard design approval.

12 So, those finality provisions provide that
13 an approved design must be used by and relied upon by
14 the staff and the ACRS in their review of an
15 application referencing that design. Unless there
16 exists significant new information that substantially
17 affects the earlier determination.

18 So, that concludes my discussion of this
19 first portion of Subpart H. The remainder of Subpart
20 H, which addresses manufacturing licenses,
21 construction permits, operating licenses, and combined
22 licenses, will be covered in the October Subcommittee
23 meeting.

24 I think they'll mention that that
25 preliminary rule text is expected to be issued in the

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1 next couple of weeks.

2 I'll just note that when that text does
3 come out, you'll see we have some notes in there about
4 things that we realized we needed to add to some of
5 the requirements in the design section. For example,
6 as we were developing the requirements for the
7 operation license and combined license section.

8 So, it's a constant learning process as
9 we're writing rule text and reflecting that rule text
10 back to other Subparts in Part 53.

11 So, I guess I'll pause here. Maybe we can
12 go to 47. Any additional questions on this first half
13 of Subpart H? Again, very similar to what you're used
14 to seeing in Part 52.

15 Okay. If not, then I will turn the
16 presentation back over to Bill to begin the discussion
17 of Subpart I.

18 MR. RECKLEY: Okay. Thank you, Nan. And
19 this is where we were expecting to be able to go a
20 little quicker. Again, because these processes are
21 generally the same as what you're accustomed too in
22 Parts 50 and 52.

23 So, I'll talk about Subpart I. And the
24 way that we broke this apart is that Subpart H, as the
25 title implies, is applications.

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1 And Subpart I is largely aimed at the
2 owner/operator, once they take control of the facility
3 and we are looking to them to maintain and when
4 appropriate, revise the licensing basis information.

5 Just like, however, just like Subpart H,
6 much of Subpart I was largely taken from existing
7 requirements in Parts 50 and 52.

8 Where there's some new information or
9 thought, we'll spend a little more time. But, if we
10 can go to -- we can just skip 49, it's just the title,
11 and go to side 50.

12 So, one thing that we do is set out in the
13 first Section, 1300, what the intent of this Subpart
14 is, and as I mentioned, it's for maintenance of the
15 licensing basis information

16 We have a definition that's similar to the
17 license renewal definition in Part 54. Not exactly
18 the same. But, in general, it's that information that
19 was provided to us, to the NRC, in support of issuing
20 the license.

21 So, in the context of Part 53, that's the
22 design information that was submitted. It's the
23 program information that's provided.

24 So, that just sets the basis for the
25 responsibilities of the owner/operator in making sure

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1 this plant conforms.

2 So, the next Section 1310 is basically we
3 broke the control, the licensing basis information
4 into two parts. And again, this is similar to the way
5 we've laid it out in Part 50 in office instructions
6 and in other documents.

7 But, the first part is, those things that
8 require prior approval. And these are regulations.
9 They are things that are in the tech specs, a
10 condition of the license, or within an order.

11 Things that from the beginning are
12 understood, a licensee cannot change without NRC
13 approval.

14 So, then 1311 lays out the process. And
15 this is the license process under Section 50.90. It's
16 basically just moved over.

17 And it's used to define how to request a
18 license amendment when needed for an early site
19 permit, construction permit, operating license for a
20 combined license.

21 53.312, public notices, and 1513, issuance
22 of the amendment, are likewise, just taken from
23 Section 50.91 and 50.92.

24 So, all of this is basically the same
25 process as is used now in terms of applying, doing a

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1 no significant hazards consideration determination,
2 issuing it for comment and opportunity for hearing,
3 and then ultimately issuing the amendment.

4 So, if we go onto slide 51. Also, within
5 Subpart I we needed to address if the owner/operator
6 would be looking to change information that was either
7 addressed directly within a design certification rule
8 and 53.1316 addresses if they were looking to change
9 information that was approved by the NRC within a
10 manufacturing license.

11 So, 1550 -- 15, I'm sorry, does basically
12 keep the same process as Part 52. And it states that
13 they need prior approval to change anything that was
14 certified in a D.C. rule.

15 Likewise, 1316 would require that, to get
16 prior approval for any changes to a design feature
17 that's subject to the manufacturing license.

18 If we go onto 52. Amendment starting
19 construction. Basically again, lays out the same
20 requirements from Part 50 and addresses both the
21 construction permit for which there's a fair latitude,
22 and for the COL, the requirements out of Part 52.

23 So, this is also an area, as Nan
24 mentioned, we'll need to integrate with the ongoing
25 50.52 rulemaking as it goes forward.

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1 But, the intention in Part 53 is to
2 maintain basically the status quo, or the status quo
3 as revised by the 50.52 rulemaking for what would
4 require an amendment during construction, and how that
5 amendment would be handled.

6 And the next part, or the next few
7 Sections within Subpart I address how to update
8 information that does not require NRC approval.

9 And the first step is -- or a step in that
10 process is to evaluate whether the change requires
11 prior NRC approval.

12 So, 53.1321 is just updating the FSAR.
13 Which would continue to be the primary licensing
14 document. And the requirements generally align with
15 50.71, which is the current requirement for updating
16 FSARs.

17 It -- there is an assumption, as I
18 mentioned earlier, in the other Subparts that the PRA
19 is playing a leading role here.

20 So, it's a key design and licensing
21 document. And therefore, it would be included in the
22 FSAR, a summary of the PRA would be provided in the
23 FSAR from the beginning.

24 And so, one thing you would not see
25 specifically is, an equivalent to 50.71(h), for

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1 providing PRA updates, because it's going to be
2 required to be within the FSAR proper.

3 So, we can go onto slide 53. This is
4 where we do introduce a little bit of change. And
5 that is, in evaluating changes as described in the
6 FSAR.

7 The process is basically the same as
8 50.59. But, given the analytical basis and the
9 methodology used is this PRA approach that we
10 previously discussed under Subparts B and C.

11 We have proposed some different criteria
12 in comparison to the traditional seven or eight
13 questions listed in 50.59.

14 And so if we go to slide 54, the first
15 question, or criterion that we would propose, is that
16 if a licensee is doing a plant modification or change
17 to procedures, that it be evaluated and they assess
18 whether the subject plant change would result in
19 either the frequency or consequences of any of the
20 licensing basis events, such that the event moves from
21 the area shown in the plot there, to the left or lower
22 of the risk significant region and moves into the risk
23 significant area.

24 And so you can see in the plot that the
25 normal expectation is that the licensing basis events

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1 are not only characterized by the mean frequency
2 consequence, but also an uncertainty band for both
3 frequency and consequence.

4 And if any aspect of the event, plus the
5 uncertainty band were to move into what the
6 methodology would classify as a risk significant
7 licensing basis event, then it would require an
8 amendment.

9 So, this goes to the little text box to
10 the left. This is in large part why we added a
11 requirement under the analysis section that the
12 analysis of licensing basis events, the methodology
13 had to include a criterion for determining if any
14 particular licensing basis event was a risk
15 significant event.

16 MEMBER BROWN: Bill?

17 MR. RECKLEY: Yes?

18 MEMBER BROWN: This is Charlie.

19 MR. RECKLEY: Yes.

20 MEMBER BROWN: How does this reconcile,
21 you know, two years ago, I think it was two years ago,
22 let me check. Oh, I lost it.

23 We went through considerable angst with
24 changes to the existing 50.59 and the NEI 96-07
25 Appendix, B, C, and D, plus Reg Guide 1.187 revision

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1 to -- well, I&C. Has this been reconciled at all with
2 the -- to be consistent with, or does it change
3 significantly the basis for changes in the existing
4 operating plans?

5 MR. RECKLEY: Well, this wouldn't -- this
6 wouldn't affect any operating plan.

7 MEMBER BROWN: No, I understand that. But
8 why should we -- why should we give away the store on
9 this new thing as opposed to what we do on the
10 existing plans?

11 MR. RECKLEY: Well, --

12 MEMBER BROWN: I'm not saying we're giving
13 away the store. I'm just -- I read the words, --

14 MR. RECKLEY: Yeah.

15 MEMBER BROWN: And they are certainly, you
16 know, you've got a limited number of words compared
17 with tens of pages to describe the characterization of
18 changes and things like that.

19 And now it's down too just, it's for event
20 sequences, et cetera, et cetera, et cetera, which has
21 not been used in the other ones.

22 MR. RECKLEY: No, I understand. And our
23 thought is that guidance will be needed to support
24 this process, just like the guidance that you
25 mentioned for 50.59.

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1 I mean, the criteria in 50.59 are of equal
2 length. They're about seven or eight lines of rule
3 text, for which there's a whole document, including
4 the NEI, you mentioned it, 97 --

5 MEMBER BROWN: NEI 96-07.

6 MR. RECKLEY: 96-07.

7 MEMBER BROWN: I had to go look it up. I
8 can never remember all the actual.

9 MR. RECKLEY: So, we would -- we would
10 think that we'll have some similar guidance for how to
11 use this.

12 But, the reason to come up with different
13 questions, or to think we couldn't come up with
14 different questions is because the methodology is
15 different than the typical Chapter 15 assessments.

16 And under L&P and NEI 18-04, all the
17 licensing basis events will be characterized this way,
18 in terms of the frequency and the consequences.

19 And it just gives us an opportunity to
20 provide criteria that to some degree are a little more
21 clear under this methodology. Because they go back
22 and they relate to how the analysis is done and
23 presented under the L&P methodology.

24 And so that's the thinking of why to come
25 up with new criteria. Is just to be specific to the

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1 methodology being used.

2 So, under the L&P, they do characterize a
3 risk significant LBE region. And the thought was, we
4 can take advantage of that and basically by
5 definition, that region is a licensing basis event
6 that warrants more attention.

7 So, it seemed a logical metric to use for
8 evaluating when a change would require NRC approval.
9 Well, as one question. It's not the only question.

10 But, to be used as one metric within
11 several metrics to decide if prior approval is
12 appropriate.

13 MEMBER HALNON: Bill, this is Greg. This
14 is pretty forward to me when you think about a single
15 change.

16 What about, and I'm assuming it maybe
17 probably in the guidance to follow, when you have
18 multiple changes in play, how do you capture the
19 cumulative impact of both and what is that?

20 MR. RECKLEY: Right. And what we, and I
21 kind of glossed over it, under the updating of the
22 FSAR, if we go back up to slide 53, I'm sorry. Nope,
23 I'm sorry.

24 The -- one of the things we include in
25 updating the FSAR in -- I'm sorry, it's one slide up,

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1 52 -- 53.21, is a reporting of the cumulative, the
2 changes in the cumulative risk since the last FSAR
3 update.

4 So, to your question, an individual change
5 would continue to be evaluated on its own merits as an
6 individual change. Basically the same is as done now.

7 But, the concern about -- not only the
8 concern, but the ability to then look at what is the
9 cumulative impact of all the changes in that reporting
10 cycle, is captured by requiring one, a report of all
11 the changes made.

12 And second, within the updating of the
13 FSAR, since it's using the PRA as a central tool, to
14 report on the change to the cumulative risk since the
15 last update.

16 MEMBER HALNON: Okay. So, what's done now
17 is the licensees keep sort of a living FSAR between
18 official updates. And that's what they would maintain
19 in this case too probably.

20 MR. RECKLEY: Yeah. That's their
21 practice. I would -- I would expect that it would
22 stay the same. I mean, it's done primarily as you
23 know, it's -- was as a tool and as an efficiency
24 measure to make sure.

25 So, I would expect it to be the same.

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1 But, the question of cumulative risk is a good
2 question. And it's one we thought about and thought
3 to include in the updating of the FSAR.

4 MEMBER HALNON: Got it. Thank you.

5 MR. RECKLEY: Okay. So, --

6 MEMBER SUNSERI: Hey Bill?

7 MR. RECKLEY: Yes?

8 MEMBER SUNSERI: This is Matt Sunseri
9 again.

10 MR. RECKLEY: Um-hum.

11 MEMBER SUNSERI: So, I appreciate the
12 discussion here. My question is, and we have quite an
13 experience base built up with the Part 50.59 and its
14 equivalent in Part 52.

15 Do you see, really see that there's going
16 to be significant gain by moving away from that large
17 experience base in this area to adopt this new
18 practice?

19 I mean, it took us a long time to get it
20 really worked out how to do 50.59 right. And it
21 seemed like there might be an equally steep learning
22 curve on this process.

23 Just -- just maybe just a comment versus
24 needing a reaction from you.

25 MR. RECKLEY: No. It's a good

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1 observation. I haven't been around a long time and
2 lived through the 50.59 changes.

3 You know, I think that largely resulted
4 from trying to come up with questions associated with
5 the current licensing methodology, the Chapter 15 and
6 the deterministic approach that's used in that.

7 And it took us some time. And you're
8 right, a lot of effort to end up in the right place,
9 including trying to risk inform something that uses
10 risk insights more indirectly than what we're
11 proposing here.

12 So, it's a -- I think it's a valid
13 observation and concern. Again, what we're thinking
14 however, is that this methodology under Part 53, and
15 more specifically under L&P, can support a more
16 analytical approach to evaluating changes than what
17 was needed under 50.59 and the associated guidance.

18 Just because we're able to build it from
19 the beginning based on the actual methodology, based
20 on the fact that we're developing what needs to go in
21 the FSAR at the same time we're evaluating now to
22 evaluate changes to the FSAR.

23 So, we're trying to take full advantage of
24 that experience. At the same time tailoring it to the
25 specific analytical methodology that we're building

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1 into Part 53.

2 So, but you know, this is another area
3 where we've asked stakeholders to weigh in. And it's
4 currently being evaluated by various stakeholders.

5 And we've put out a special request to any
6 of them that have done tabletops or -- as part of L&P
7 development, or TICAP development, to really look at
8 this and give us feedback since they have direct
9 experience on using the methodology.

10 So, it's a good point. We'll take it into
11 account along with any feedback we get from other
12 stakeholders.

13 MEMBER SUNSERI: Oh, no, no that's good.
14 I'm glad to hear that you've made it a focus point of
15 comment for them, for the stakeholders. So, I
16 appreciate that. Thanks.

17 MR. RECKLEY: Thanks. So, if we go --

18 MEMBER BROWN: Bill?

19 MR. RECKLEY: Yeah, go ahead.

20 MEMBER BROWN: Let me just amplify a
21 little bit. I mean, the effort we went through was,
22 the changes involving going from analog to digital
23 instrumentation.

24 And digital instrumentation, I mean, your
25 instrumentation control systems are not exactly what

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1 I call PRA devices. I mean, it's -- they're binary
2 devices. They either work or they don't work.

3 You turn a switch, an alarm goes off, and
4 you create a different accident than you did initially
5 with the analogy stuff because of the performance
6 characteristics of digital stuff, so that there was
7 considerable work.

8 And I'm still trying to figure out how
9 this would apply in that role, as opposed to what
10 people normally look at in most of the PRA
11 applications.

12 I'm just nervous about all of a sudden we
13 abandon that and we have to recreate a new effort.
14 And nobody has looked at this specific iteration that
15 was gone through two years ago, and to see how this
16 change impacts that.

17 MR. RECKLEY: Okay. That's fair enough
18 Charlie. And I'm not directly involved in that. And
19 so I will take away and we'll talk with our I&C folks.
20 And Ian Young is a part of our team.

21 So, you know, we will look specifically at
22 how that would work within this. And if we see
23 something, maybe we'll add a criterion or rethink what
24 we've done here.

25 So, I --

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1 MEMBER BROWN: I would appreciate that.

2 MR. RECKLEY: Okay.

3 MEMBER BROWN: And I think you ought to
4 address it in somewhat more detail in one of the later
5 meetings.

6 MR. RECKLEY: Okay.

7 MEMBER BROWN: If you can.

8 MR. RECKLEY: right.

9 MEMBER BROWN: I mean, it's -- this is
10 short and crisp, these two, three slides.

11 MR. RECKLEY: Right.

12 MEMBER BROWN: All right. Yeah, and it's
13 NEI 96-07, and it's Appendix D.

14 MR. RECKLEY: Right.

15 MEMBER BROWN: Plus the Reg Guide 1.187,
16 which was modified also explicitly to --

17 MR. RECKLEY: Right.

18 MEMBER BROWN: To ensure that the caveats
19 and clarifications were put in. And which we did have
20 some, because there was a big contest between the
21 staff and NEI as to what something else meant and not
22 meant.

23 And we eventually got that resolved. And
24 got it approved. So, which was a good thing. It
25 needed some flexibility.

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1 But, I don't want to destroy that in this
2 process either. Or get it -- let it be forgotten
3 about. All right.

4 MR. RECKLEY: Okay. So, if we go onto
5 slide 55, the next question that we would ask is, if
6 the FSAR analysis already included event sequences
7 that were within an area deemed risk significant, then
8 we would look to say, does the change decrease the
9 margin to the acceptance criteria, so, in this case it
10 might be the FC target line, by 10 percent?

11 And 10 percent is a somewhat arbitrary
12 number. But, it's generally consistent with the more
13 than minimal discussions in 50.59.

14 So again, we're trying to take advantage
15 of the analysis and the way it's represented, and
16 basically looking at the licensing basis events and
17 saying, does the plant change actually move the plot
18 in terms of an event sequence, such that it's getting
19 closer to the acceptance criteria or the FC target in
20 the case of NEI 18.04.

21 Then going onto the next question, on
22 slide 56, again, given that we have the PRA as the
23 central tool, the third question is, look at the
24 cumulative risk.

25 This goes somewhat to Greg's question.

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1 But also, it's looking at this in the context of an
2 individual plant change being evaluated.

3 And does that plant change result in a
4 change result in a change to the cumulative risk? And
5 again, we use the 10 percent to be generally
6 consistent with the more than minimal discussions in
7 50.59.

8 And then the second box there is just
9 referring back to Subpart B and the criteria to remain
10 below the QHOs.

11 So, then if we go onto 57, an additional
12 question, and this one parallels very closely to
13 59.59(c)(1)(8), and that goes to ensuring that the
14 evaluation of the change is actually evaluating the
15 change.

16 And that a licensee is not taking
17 advantage of evaluating it at a different way, or
18 using a different code in order to show that the
19 margins have not been reduced. You have to basically
20 assess it with the same method of evaluation.

21 And if you want to change the method of
22 evaluation, you have to follow the process for that,
23 which would be NRC approval or perhaps NRC endorsement
24 within some other consensus code or standard.

25 Then 58, slide 58, goes to what I was

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1 talking about earlier, when a margin, analytical
2 margin, is being used for an operating flexibility,
3 one way to show that within the NEI 18-04 typical FC
4 diagram, would be to put the alternate criteria, and
5 I just picked one rem in this case, which is used both
6 within the staff's paper on siting guidance, also
7 within the emergency planning zone rulemaking.

8 It might also be used in other parts of
9 53, that we'll get too later. But, then if that is
10 established and used to justify something like a
11 reduced emergency planning zone, the question within
12 1322 on evaluating changes, relates to the margin
13 between your licensing basis events and the alternate
14 threshold that was chosen. So, in this case, one rem.

15 And the criterion is again, put in terms
16 of a reduction in margin and a value of 25 percent
17 was used in this case.

18 And the rationale for using a different
19 number for this because we had used 10 percent within
20 the facility safety program as a threshold. So, a
21 license amendment would need to be some value higher
22 than that. And so we picked 25.

23 But again, all of the specific numbers we
24 would get too in a subsequent discussion. But again,
25 the underlying rationale here is to assess the margins

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1 and the reductions in margins to your thresholds, be
2 they the frequency consequence curve, or an
3 alternative such as the one rem shown in red.

4 So, that is the proposed five questions
5 that would replace the -- or serve the same purpose as
6 the eight questions in 50.59. A little more numerical
7 if you will in terms of considering the reductions in
8 margins.

9 That's one of the things stakeholders
10 might comment on. Some like a criterion like 10
11 percent to be in the rule. Others prefer vague
12 language like more than -- more than minimal with the
13 guidance used to define what that means.

14 So, we'll take all of those comments into
15 consideration as we move forward. So, that's 1322 on
16 evaluating plant changes.

17 The next slide, 59 talks about basically
18 the other large set of licensing basis information.
19 And that is the program document.

20 And here in the discussion table that we
21 released with the language, we included the same
22 questions that I just went through for program
23 changes.

24 But, we acknowledged that programs are
25 often, it's harder to assess the change in the program

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1 in terms of its impact on an item like where a plot is
2 on a frequency consequence diagram for licensing basis
3 events.

4 And generally just opened it up for
5 questions about what would be appropriate questions to
6 ask. The staff has had a challenge over the years
7 because the languages for changes in programs use
8 things like decrease and effectiveness, or reduced
9 commitment in the terms of QA, which are kind of
10 vague.

11 But, as Charlie mentioned, over the years
12 we've also developed a fair amount of guidance to
13 address those. So, we basically are just kind of at
14 a point of asking stakeholders to weigh in on whether
15 we can develop questions, generic questions that would
16 be applicable to all kind of programs.

17 Or just recognize that the criterion for
18 something like ISI/IST, has to be developed separate
19 from the criteria that would be used for radiation
20 protection or emergency planning.

21 So, this is an area where we didn't fully
22 bake the pie, I guess, and are just asking for some
23 views before we can -- before we go ahead and complete
24 out this section.

25 And I jumped ahead a slide. I'm sorry.

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1 The updating of the program documents is the same as
2 currently use.

3 MEMBER BROWN: Bill, could I --

4 MR. RECKLEY: Yeah.

5 MEMBER BROWN: Could I interrupt again?

6 MR. RECKLEY: Yeah.

7 MEMBER BROWN: Just trying to refresh my
8 memory. You said you'd go do something with it. But,
9 when I went back, I just went and found 10 CFR 50.59,
10 and that part that talks about changes, to see
11 wherever it is back in here.

12 MR. RECKLEY: Right.

13 MEMBER BROWN: A change to the techni --
14 yeah, C(1). And then it has the section 2 where
15 there's eight criteria.

16 So, you shall attain a license amendment,
17 it's fairly specific. And it goes through eight
18 items.

19 You've only got -- you didn't seem to map
20 those over into how the new 1322 covers that, those
21 items as well as whatever was done for digital.

22 So, the original stuff plus that. I guess
23 that's what I would be interested in hearing to see
24 how we -- that doesn't bear a whole lot of resemblance
25 to result in more than a minimal increase in

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1 likelihood of an occurrence, or create a new accident,
2 or a new malfunction, et cetera, et cetera, et cetera.

3 So, I just wanted to make sure that I kind
4 of covered what I was thinking about.

5 MR. RECKLEY: Okay. And --

6 MEMBER BROWN: In terms of how we look at
7 it.

8 MR. RECKLEY: Okay. And yeah, we didn't
9 map it out because -- but we can, and support that in
10 a future discussion, just because like you just
11 mentioned, one question would say, do you increase the
12 likelihood, and other, the consequence?

13 Well, that -- that's addressed in a single
14 question in terms of the L&P since you're plotting it
15 on a frequency consequence plot that a reduction in
16 margin could be associated with either change in the
17 frequency or the consequence.

18 But, we can map it out. And then like I
19 said earlier, we will look at the -- at the digital
20 guidance that was more recently put out.

21 MEMBER BROWN: Well yeah, well those, you
22 know, C(2)(a), C(2)(I), you know, roman number I
23 through viii, --

24 MR. RECKLEY: Right.

25 MEMBER BROWN: Are dif -- I mean, one of

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1 them is, you know, create a possibility of a
2 malfunction that hasn't been considered. You know,
3 where does that -- where -- how does that -- all I'd
4 like to see is how do we map our existing
5 requirements, and we make sure we cover the, at least
6 the thought process or the basis for why we had those
7 the old way.

8 MR. RECKLEY: Right.

9 MEMBER BROWN: That's all.

10 MR. RECKLEY: Okay.

11 MEMBER BROWN: Okay, I'm sorry to belabor
12 it, but I --

13 MR. RECKLEY: No, no, no. I understand.

14 MEMBER BROWN: I generalized it the last
15 time. And I'm just trying to get a little more
16 specific.

17 MR. RECKLEY: Okay.

18 MEMBER BROWN: Thanks.

19 MR. RECKLEY: So, if we can -- yeah, I'm
20 sorry. So, go back to 59 just for a second. So, 59
21 talks about the updating of documents.

22 And this is generally consistent and along
23 the lines of the FSAR updates. The program documents
24 would have to be submitted routinely, updates to them.

25 And then go on to slide 60, the change

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1 control, 1333, that's the one that I was talking
2 about, that we are trying to engage stakeholders and
3 come up with an approach on whether a generic approach
4 is even possible.

5 Or whether we really need to define change
6 controls specific for each program document. Again,
7 recognizing that they range from ISI/IST, to radiation
8 protection, to emergency planning.

9 1340, 1350, transfer of licenses,
10 termination of licenses. These are largely taken as
11 they are in either 50.80 for the transfer, or 50.82
12 for the termination.

13 Then we go down to 61, information
14 requests. This next couple get into processes that
15 are somewhat scattered throughout Part 50.

16 For example, information requests are
17 covered in 50.54, paragraph F in particular. You're
18 familiar with those. That's what we cite for generic
19 letters and things like that.

20 But, the requirement that we're proposing
21 in 1360, and this is a burden to put on the staff, is
22 basically the same as 50.54(f). We have to justify
23 our request to licensees to provide us information.

24 The revocation suspension, modification of
25 a license in 53.1370 is the equivalent to 50.100 that

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1 describes those same things for a Part 50 licensee.

2 Backfitting is 53.1380. Again, given the
3 history of that, we didn't propose any significant
4 changes to that process. It reads, it was taken from
5 50.109.

6 And then lastly, 53.1390 is a section
7 entitled renewal. And we are currently contemplating
8 what to do with license renewals.

9 How much we can take advantage of Part 54.
10 What we would put in Part 53 to either reference it,
11 or mirror the requirements in that part.

12 We really haven't begun that assessment
13 very fully. And so we just have a placeholder for now
14 under 1390 for renewal.

15 And if we go to the last slide, that's
16 just a general discussion for Subpart I, maintaining
17 licensing basis information.

18 Okay. And this is not surprising because
19 again, we're not proposing much change. And I thought
20 this was where we would gain some time.

21 And so Dave, if it's okay, I mean, we've
22 only been at this an hour, we can jump into Subpart J.
23 And then maybe that would be a convenient time for a
24 break.

25 And if we want to try to get ahead and do

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1 what we had planned for tomorrow morning, I'll make
2 sure we've got the right staff lined up.

3 And then maybe after the break we could do
4 those two topics. Again, because we were only teeing
5 them up. So, we don't think -- they're very major
6 areas, but we're only teeing them up.

7 So, we would be able to support the
8 discussion to fill out the afternoon on those.

9 CHAIR PETTI: Yeah. I think let's keep
10 going.

11 MR. RECKLEY: Okay. So, the next one,
12 Subpart J, reporting and administrative requirements
13 falls into this same category that Nan described for
14 Subpart H, and was true for the majority of Subpart I,
15 which are that the requirements are largely taken from
16 existing requirements.

17 And we're not proposing under Part 53 to
18 introduce any significant changes to them. So, if you
19 go to the next slide.

20 MEMBER HALNON: Hey Bill, this is Greg.

21 MR. RECKLEY: Yeah?

22 MEMBER HALNON: Just general question for
23 this section. Back in the '17/'18 time frame, the
24 Commission put out that project to the retrospective
25 review of administrative requirements.

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1 And I know that's still in process,
2 nothing's been done, at least resulted yet in -- I
3 mean, I think there had some changes, but no
4 regulatory changes, or regulation changes.

5 Are you guys looking at that to leverage
6 some of the good ideas that the staff's come up with
7 on eliminating duplication and unnecessary reports and
8 what not?

9 MR. RECKLEY: I think -- I think we have.
10 But, it's always a challenge, because there's so much
11 going on at the same time.

12 And there's not only those agency
13 initiated activities, there's also petitions for
14 rulemaking going on. And we've already mentioned the
15 other rulemakings that are going on.

16 So, I wouldn't guarantee that we've
17 captured everything. But, we've -- but we've made an
18 effort, I will say by in large, we're capturing the
19 existing requirements and then trying to capture in
20 the discussion column if there's some ongoing
21 activities that are related.

22 Because it's, just as a convention,
23 because if we -- if we try to put things that are in
24 flux within this system that's also in flux, it's just
25 harder to manage.

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1 But, we are trying to keep track of them.
2 And definitely if any changes occur ahead of us, we'd
3 be in a position to take advantage of it.

4 MEMBER HALNON: Okay. And there's some
5 clear potentials, especially with the new technology
6 of communicating, as opposed to the 1970s when that
7 rule was put in place, where you, you know, --

8 MR. RECKLEY: Right.

9 MEMBER HALNON: When the fax machine was
10 the most coolest thing around.

11 MR. RECKLEY: Yes.

12 MEMBER HALNON: So, and --

13 MR. RECKLEY: Yeah. And I'll agree with
14 you 100 percent on that. I will also throw out a
15 caution, and I don't think this will show up in the
16 rule texts, but there were a lot of reporting
17 requirements for the first decade or two for light
18 water reactors.

19 And some of that was just a way to keep up
20 with operating experience. And I agree with you 100
21 percent, there's better ways to do that now than there
22 was at that time frame.

23 But, many of the reports were also
24 eliminated later on as comfort levels with
25 technologies and behavior and so forth was

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1 established.

2 And so somehow as new technologies are
3 introduced, everybody has to realize that the
4 regulator is interested in keeping track of the
5 experience and what's happening for those new plants,
6 even if the reporting requirement was eliminated for
7 light water reactors after a couple decades of
8 reporting.

9 MEMBER HALNON: Yeah. Well, that's a
10 really good point. And I acknowledge that we'll want
11 to know as much as we can about these advanced
12 reactors as we get them licensed.

13 MR. RECKLEY: Right. Right. And that
14 happens through a variety of mechanisms. I just try
15 to -- we're trying to take the total picture.

16 I mean, we have another activity under way
17 to look at inspection and oversight kind of activities
18 for advanced reactors.

19 And so when you're trying to look at the
20 whole regulatory fabric, you can look and say, I might
21 be able to do less inspection, but where is that
22 information going to come from?

23 Well, one way to do it is through a
24 reporting requirement. Or vice versa. If I'm not
25 going to have a reporting requirement, bear in mind

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1 then that as I'm looking at the whole, one way to make
2 sure that I'm learning what I need to know is through
3 an inspection activity.

4 And so, all of that is in play right now.
5 And it's an advantage that we have in trying to
6 develop the whole thing at one time.

7 It's also a tremendous challenge.

8 MEMBER HALNON: Yeah. Yesterday in the EP
9 Subcommittee, the staff mentioned that you guys were
10 looking at the framework for oversight.

11 And I think that we'll be wanting to look
12 at that as well as the EP, with the EP folks and
13 certainly come up with for EP to kind of finish the
14 puzzle that we're putting together with this new
15 reactor stuff.

16 MR. RECKLEY: Right. And that expectation
17 is there. We're fairly early on that effort.

18 MR. HALNON: Yeah. We heard it was like
19 a two-year effort.

20 MR. RECKLEY: Okay. So, if we -- if we
21 can go down then to 66. So, we start out with 1500,
22 which just generally lays out the purpose of the
23 Subpart. Again, it's covering many administrative
24 areas.

25 Then we start with 53.10, which is largely

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1 taken from 50.70. And that is a requirement to ensure
2 that the NRC has unfettered access to do inspections.

3 We did tweak some of that a bit because
4 the existing requirements reflect the light water
5 world and the current conventions.

6 So, sometimes we change things to say, for
7 example, this is the office space if a resident
8 inspector is to be assigned to the plant. Recognizing
9 that it's possible that not all future plants would
10 have resident inspectors.

11 So, but we didn't provide the criteria.
12 That's coming up. That will be coming out of that
13 broader effort on inspections and oversight, if we're
14 going to have criterion for when we would have a
15 resident, or how long.

16 You know, it's not necessarily -- it
17 doesn't necessarily have to be, once assigned they're
18 there for the duration. But, all of that is being
19 developed, or will be developed down the road.

20 But, the bottom line is, 1510 says you, as
21 a licensee, have to give the NRC unfettered access.
22 And that even includes making office space available.

23 1520, maintenance of records. Again, that
24 was largely derived from 50.71. Then the next two,
25 53.1521 and 1530, are the equivalent of 50.71 -- I

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1 mean, 50.72, I'm sorry, on immediate notifications,
2 those that are done largely over the telephone to the
3 operations center.

4 And then 1530 is similar criterion for
5 licensing event reports. Those are the, you know, the
6 reports submitted within 30 days of the event.

7 The requirements, we tried to be
8 consistent. The changes are trying to make it
9 technology inclusive.

10 So, we try to keep the same general level
11 of reporting, but use the terminology associated --
12 not associated with light water reactors, but a more
13 neutral terminology.

14 The second bullet under 21 mentions what
15 I had said before, there is -- we don't fully account
16 for the things that are just getting started, looking
17 at immediate notification requirements. So, that, I
18 think, is related to a petition, if I recall.

19 So, if we go to slide 67. I mentioned
20 1530 is the equivalent of 50.73, the licensee event
21 reports.

22 Again, what we were trying to do in the
23 language was keep the right level, or a similar level
24 in terms of significance. But, just make the language
25 technology inclusive.

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1 The -- 1535 is equivalent to 50.78. And
2 that's a form that is filled out to provide facility
3 information to IAEA.

4 Then we get into a couple of sections
5 related to financial requirements. So, 1560 is just
6 an intro. Then 1561 is the financial qualifications.

7 That was taken from 50.33(f) which is
8 provided in a content in the section to Part 50
9 related to contents of application.

10 We just reworded it to be a technical
11 requirement or in this, an administrative requirement,
12 however you want to think about it, to say that an
13 applicant needs to be financially qualified.

14 And that basically means that they have
15 the funds. If it's -- if it's for a construction
16 permit that they have the funds for example to
17 complete construction.

18 Other -- there is some work in this area.
19 This is another area in which the staff has a proposed
20 rule before the Commission.

21 So, we're just watching this. If it moves
22 one way or another, we'll just have to make
23 adjustments.

24 But the bottom line is, that we're
25 maintaining requirements, and more or less have to,

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1 out of the Atomic Energy Act, to include some
2 consideration that an applicant is financially
3 qualified to proceed.

4 And the second bullet there just basically
5 says, what information an applicant will need to
6 provide, we'll pick up in Subpart H.

7 What we're trying to do in Subpart H is to
8 include the content of applications. And currently
9 the content of applications is also used within Part
10 50 and to some degree 52, as a way to introduce
11 technical requirements.

12 What we're trying to do in Part 53, is
13 always have a technical or administrative requirement
14 to find within the part so that Subpart H, when it
15 talks about content to application, has a technical
16 requirement to point to.

17 That might seem a minor point. But, it's
18 a kind of convention that we've adopted to try to make
19 sure that the actual technical requirement, or in this
20 case administrative requirement, is defined.

21 And then the content to application
22 sections have a requirement to point to, versus the
23 first time you come across the requirement it's in a
24 content application.

25 So, if we hadn't fully described it

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1 before, that is a convention that we're trying to
2 maintain as we go through Part 53.

3 And, but it also explains why we may have
4 administrative or technical requirements that look new
5 in comparison to Part 50 or 52, but it's only because
6 50 or 52 introduce those requirements in the context
7 of a requirement content of application.

8 So, 53.1562 is just the requirement taken
9 from 50.71(b) for licensees to provide annual
10 financial reports.

11 Then if we go onto 68. Likewise, 1563
12 just brings in an existing requirement from 50.76 that
13 obligates them to tell us of a change in their
14 financial status.

15 Likewise, 1564 brings in the requirement
16 form 50.81 that talks about their obligation to
17 creditors. And if that changes, they need to report
18 to us.

19 Then 53.1570 gets into financial
20 protection. And there's two general provisions that
21 we put in this category of financial protection.

22 The first is the requirement for insurance
23 to ensure that the licensee has the ability to
24 stabilize and decontaminate a plant following an
25 accident.

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1 So, these are the costs that are -- that
2 would be incurred by a licensee to clean up their own
3 facility. That's currently included or described in
4 50.54 (w) .

5 And the current requirement is that they
6 carry insurance in the amount of a little over one
7 billion dollars to meet that obligation.

8 The one thing that we have added as a
9 thought in the preliminary language is to allow a
10 design specific estimate in lieu of the one billion
11 dollars. Otherwise, the language is similar or the
12 same as what's in 50.54 (w) .

13 They need to have this kind of insurance.
14 The only thing we -- the only thing that we're adding,
15 is a recognition that some of the smaller units being
16 contemplated might require less than a billion
17 dollars.

18 And so we put in a provision allowing for
19 a design specific estimate that would be reviewed and
20 accepted by the staff.

21 Then the other one that falls in the
22 financial protection bucket is the liability, the
23 things covered by Price-Anderson Act, Part 140. And
24 here again, we're not proposing any changes.

25 The Part 140 already includes some

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1 criteria for -- or it includes some ability to look at
2 things like power level to determine the amount of
3 coverage. It includes power levels to determine when
4 a licensee would need to participate in the secondary
5 coverage.

6 Price-Anderson includes a primary
7 insurance and then secondary coverage that comes from
8 basically all licensees being required to pitch in to
9 cover the liability if there's an accident at any
10 other reactor. So, that's called the secondary pool.

11 So, all of that we are proposing to bring
12 in largely by reference to Part 140 without any --
13 without any changes under Part 53 for these -- for any
14 reactor that might be making an application under this
15 Part.

16 So again, this Subpart J, largely just a
17 collection of various administrative requirements
18 without any substantial changes. Or at least we
19 didn't intend to make any substantial changes.

20 So, with that, any questions on Subpart J?

21 MEMBER BIER: Yeah. This is Vicki Bier.
22 I had one question about the insurance requirements.
23 Earlier today we heard about how like the dollars per
24 mrem is no longer up to date with current values due
25 to inflation, et cetera.

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1 And was there any consideration into
2 specifying that insurance requirement in some other
3 way than just a straight dollar amount if we already
4 have the experience that our dollar amounts are
5 getting obsolete?

6 MR. RECKLEY: The short answer is no.
7 We're not proposing to introduce a change like that to
8 either Part 140 that covers Price-Anderson.

9 That does have a factor that goes up. We
10 update that every couple years. So, that one does
11 have a provision.

12 And that's why the amount of available
13 coverage has increased dramatically over the years.
14 The insurance that's at the one billion dollar level,
15 I don't believe that has any kind of an inflation
16 factor built into it.

17 I'd have to go back and look. It's a
18 little -- this gets down into an area of expertise I
19 must admit I don't have, so.

20 MEMBER REMPE: So, Bill? Greg, you can go
21 first if you want.

22 MEMBER HALNON: Yeah. I was just going to
23 quickly ask what the decommissioning funding insurance
24 was?

25 MR. RECKLEY: We will -- we will address

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1 that in Subpart G.

2 MEMBER HALNON: Okay.

3 MR. RECKLEY: On decommissioning. And
4 it's another area where I'm not sure we'll have a lot
5 of changes.

6 But, Part 75 -- I mean, 50.75 now, you
7 know, it includes values that were derived from the
8 experience of decommissioning PWRs and BWRs.

9 And somehow we'll have to address that
10 there's -- that there's limited experience in
11 decommissioning non-light water reactors.

12 And so that's one of the things that we're
13 really looking at as we develop Subpart G.

14 MEMBER HALNON: Okay. More to come.
15 Thanks. Go ahead, Joy. Thanks.

16 MEMBER REMPE: Okay. So, I'm kind of
17 thinking about consistency of logic. And we've heard
18 lots of discussions over the last few months about oh,
19 the physics are different. These things are safer.

20 And all of that. And there's a lot of
21 things that we're trying to reduce, because we think
22 that they have a -- they're more passive and they have
23 a longer response time, and accidents are going to be
24 so less likely.

25 Are we going -- have any of the

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1 stakeholders said, well, we don't need insurance also?

2 MR. RECKLEY: Well, I don't know if --
3 we've not had detailed discussions about the
4 equivalent to 50.54(w), the price for recovering their
5 own facility.

6 We did have a series of public meetings on
7 Price-Anderson and liability insurance. And one of
8 the reasons for that is the NRC owes Congress a
9 periodic report on Price-Anderson soon. It maybe
10 later this year.

11 And so, as part of the development of
12 that, we did engage stakeholders and went into, you
13 know, what the current requirements are. You might
14 remember back in the NG&P, or even before that days,
15 there was a provision added for modular reactors.

16 And that was actually a change to Price-
17 Anderson and a change to our regulations in 140, Part
18 140 that basically allowed reactors above 300
19 megawatts to be treated as a single facility up until
20 1200 megawatts. Or I might have the numbers slightly
21 wrong.

22 But, in any case, it was a provision
23 especially for modular reactors that would limit the
24 impact of their participation in the secondary pool by
25 saying multiple units could be treated as one unit in

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1 doing that math.

2 So, basically instead of, if I had four
3 300 megawatt reactors, the way it existed before that
4 change was, that would have been four reactors subject
5 to the secondary pool at 12 million dollars a year, up
6 to 120 million dollars or something.

7 So, what they changed that to was those
8 four reactors, since they in total were less than
9 about 1200 megawatts, that they would be treated as
10 one unit.

11 So, there were some changes. I don't want
12 to say it was all static. But, the bottom line is
13 when we talked to the stakeholders about changes, they
14 thought by in large Part 140 was already flexible
15 enough.

16 It already showed a dependence on power
17 level that they would not pursue, or they weren't
18 really encouraging us at this time to pursue any
19 changes to that.

20 MEMBER REMPE: What did research reactors
21 do, the larger ones, like the MIT reactor or NIST or
22 something like the University of Missouri Columbia
23 reactor, do they have any sort of requirements that
24 they have to meet with respect to insurance?

25 MR. RECKLEY: I'll have to get back to

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1 you. I forget. If -- since -- but since the -- even
2 if they did, given that it is power dependent, it's
3 like in the -- it's a much reduced number.

4 But, the applicability to RTRs, offhand I
5 forget. I'll get back to you.

6 MEMBER REMPE: Yeah. And I know they
7 don't operate all the time.

8 MR. RECKLEY: Right.

9 MEMBER REMPE: But now we're talking about
10 a lot of changes here, like with the EP planning.
11 Well, okay, if we're going to do something like that
12 for these reactors that operate all the time, and if
13 we really believe all of this analysis, I'm just kind
14 of wondering, well, maybe they don't have to do
15 insurance.

16 I mean, it -- I mean, either we do or we
17 don't believe it. And so, and I'm not sure why I
18 followed that question. But, it just seems a little
19 inconsistent.

20 MR. RECKLEY: Well, another -- another way
21 to possibly address this, and we don't set rates, but
22 another way to look at it is, you require insurance
23 and improved performance can be reflected in the
24 rates.

25 Not -- not a binary no insurance required.

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1 But, insurance required, but if you're able to
2 demonstrate --

3 MEMBER REMPE: Being a safe driver.

4 (Laughter.)

5 MR. RECKLEY: You're a -- that's right.
6 If you've got the -- if you plug in the little thumb
7 drive to your car, you can get less of -- less rates.

8 And I see Steve Lynch has his hand up.
9 And he's going to answer the question I couldn't
10 answer.

11 MEMBER REMPE: Okay.

12 MR. RECKLEY: So Steve, go ahead.

13 MR. LYNCH: Sure. Sure. No problem. So,
14 my name is Steve Lynch, Senior Project Manager with
15 the Non-Power Production and Utilization Facility
16 Licensing Branch at the NRC.

17 So, the research reactors are required to
18 have insurance. And this is implemented through the
19 Price-Anderson Act. And there are specific amounts
20 that are required for these reactors implemented in
21 our regulations in 10 CFR Part 140.

22 The amounts of insurance that were
23 determined for different facilities, if you go back to
24 the statements of consideration for this, were all
25 based on the expected radiological hazard of these

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1 facilities.

2 And the NRC established different amounts
3 of insurance that would be needed based on increasing
4 radiological hazards from very small reactors up to
5 the large power reactors.

6 MEMBER REMPE: So, anyway that's something
7 that maybe we ought to think about at some level.
8 But, we'll just have to see where it goes.

9 MR. RECKLEY: Okay. Any other questions
10 on Subpart J?

11 CHAIR PETTI: I don't see any hands.

12 MR. RECKLEY: Okay. So Dave, maybe if
13 it's okay with you, I think -- because again, we were
14 just going to tee them up. And we only have maybe, I
15 don't know, 10 or 20 slides on Subparts F and the
16 deterministic or traditional option.

17 Do you want to take a break and then come
18 back and knock those two out of the way and free up
19 your -- free up your --

20 CHAIR PETTI: Yeah. I think most of them
21 -- most of them would want --

22 MR. RECKLEY: Free up your morning?

23 CHAIR PETTI: Would want Friday morning
24 back. So yeah, let's -- let's break. Well, let's
25 just break to the top of the hour. We'll come back at

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1 the top of the hour.

2 MR. RECKLEY: Okay. All right, great.
3 Thank you.

4 CHAIR PETTI: We're in recess.

5 (Whereupon, the above-entitled matter went
6 off the record at 3:37 p.m. and resumed at 4:00 p.m.)

7 CHAIR PETTI: Okay. Bill, it's 4:00, so
8 let's reconvene the meeting and --

9 MR. RECKLEY: Okay. Thanks, Dave.

10 Maybe if we could just go to slide 71. So
11 as I mentioned earlier -- and we have just a few
12 slides to go over this because we have yet to release
13 the preliminary rule text for either of these topics,
14 but we're planning to do so in the near future and
15 would expect to be able to talk in more detail about
16 both of these items at the October meeting.

17 And so the two topics are the personnel-
18 related sections of Subpart F and then the development
19 of a more traditional deterministic option for those
20 reactor designers or licensees who want to take that
21 approach for various reasons, like I mentioned one of
22 the major ones being consistency with the
23 international marketplace.

24 So if we go down to slide 72, the first
25 topic is Subpart F, requirements for operation is the

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1 title of the subpart, and then this one is general
2 staff training, personnel qualifications, and human
3 factors requirements.

4 And Jesse Seymour is on the line and I
5 would just ask Jesse -- just weigh in whenever you
6 want to provide an additional detail or you see me get
7 hung up or say something wrong. Just feel free to
8 weigh in.

9 So slide 73, just the title for this
10 section.

11 And slide 74 -- we had talked when we
12 developed -- when we had talked to you some time ago
13 Subpart F that we generally line Subpart F up into
14 three parts, and that's the plant or the hardware, the
15 people, and the programs. And those three major
16 components of Subpart F address those things that
17 would be needed during operations to make sure that
18 the plant behaves, the people are able to support it,
19 the programs support, keeping the plant consistent
20 with the licensing basis, with the analysis and so
21 forth.

22 So we talked on the hardware side about
23 things like configuration management, the technical
24 specifications for safety-related equipment,
25 reliability assurance programs and other special

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1 treatment requirements for non-safety-related, but
2 safety-significant equipment, the maintenance -- the
3 equivalent of the maintenance rule and things like
4 that. Today we're going to tee up the missing
5 sections in Subpart F which are related to the people.

6 So we did -- in May of 2021 Jesse and Juan
7 Uribe walked through a white paper that we had
8 released to support discussions with stakeholders and
9 initial interactions with the ACRS. And if you can
10 recall that white paper, much of what we'll talk about
11 today was introduced and some of the proposals that
12 will be in the preliminary rule text to be released
13 shortly relate directly to that white paper.

14 In terms of existing regulatory
15 requirements that will get picked up in these sections
16 of Subpart F are some of the human factors engineering
17 requirements that followed the Three Mile Island
18 accident and were captured in 50.34(f); portions of
19 50.54, like 50.54(m) that currently gives the number
20 of operators based on the number of units; 51.20, the
21 training rule; and potentially we would roll in all
22 the requirements that are currently in Part 55 related
23 to operator licensing.

24 So if we can go onto slide 75? As you're
25 aware, even for recent light-water applications like

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1 NuScale the notion of a more flexible approach and
2 determining a number of operators, for example, that's
3 different than 50.54(m) has been undertaken/assessed
4 by the staff. And going forward we just see that
5 expanding and requiring even more flexibility and
6 ability on our part to consider alternatives to the
7 fairly prescriptive requirements that are currently in
8 place based on the operating experience and history
9 and analysis associated with large light-water
10 reactors.

11 That said, the notion of assessing the
12 role of people and the importance people can play is
13 going to be central to this whole assessment. So
14 we're not entering into this with a notion of no one's
15 required, we are obligated to show where people are
16 necessary. It's more; at least I'll speak personally,
17 the view of it's a tall hurdle that one will need to
18 show if one is going to try to say that people play a
19 significantly lesser role.

20 Now that said, that is -- the goal of the
21 Advanced Reactor Policy Statement would be that the
22 design of the machine can support less reliance on
23 human actions. And that's not surprising if you look
24 at the history and the timeline, the development of
25 the Advanced Reactor Policy Statement in and around

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1 the time of the accident at Three Mile Island. So
2 we're trying to take a balanced approach here.

3 The middle bullet, Functional requirements
4 analysis and function allocation. I like to start
5 with that one personally because it really -- just
6 like we're thinking for the machine and the analysis
7 of the design, starting from the premise of what needs
8 to be done and how is it going to be accomplished and
9 to what are you allocating the responsibility for
10 meeting that function? What systems on the hardware?
11 And then in particular under these sections under
12 Subpart F what are the roles that might be assigned to
13 people in performing or guaranteeing any of those
14 functions are required -- are fulfilled?

15 And then from that the applicant would be
16 required to build out their concept of operations, how
17 they envision running this facility. What is the
18 command and control? Again, what is the role of
19 people and various staff in the operation of the
20 machine and interactions with -- in the emergency
21 response mode and so forth?

22 So really in large part those couple
23 middle bullets in my mind take a prescriptive approach
24 that we've put in place for light-water reactors by
25 going through this exercise and looking at operating

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1 experience by doing numerous, numerous studies and
2 putting in place fairly prescriptive requirements for
3 machines that are similar: boiling water reactor,
4 pressurized water reactors, and replacing that within
5 the requirements with basically a requirement or set
6 of requirements that require the designer, the
7 licensee, the applicant to perform the assessments
8 that were done for the large light-water reactors and
9 come up with their own justification in this case for
10 what is the role of people in performing the safety
11 functions and how they're going to organize that.

12 So in that way this set of requirements
13 related to personnel aligns with the other parts of
14 Part 53 that we've shown you, and it is a little
15 different because it puts more onus on the designers
16 to do the analyses and make the proposals, albeit
17 we're laying out the methodology that they use.

18 So building from that, once you assign --
19 how we envision this being laid out is once you
20 determine that the operators and other personnel have
21 a role, then you do the human factors engineering to
22 make sure that it can be done, task analysis and so
23 forth. You make sure that the human system interfaces
24 are supportive. If they need to know -- this goes
25 back to the 50.34(f)-type requirements to make sure

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1 displays are providing the right information, to make
2 sure that if there's operator actions to be taken,
3 that they can be taken, and they're straightforward
4 and labeled and understood and so forth.

5 Then operating experience needs to be
6 considered. The staffing plan would need to be
7 developed. Again, we're trying to make sure that we
8 can accommodate a fair degree of variety and how that
9 might look and remain flexible, but the amount of work
10 to be done in areas like this one can look at the
11 recent NuScale experience and understand that it's not
12 a minor undertaking to try to say you're going to base
13 all of this on an assessment of your design and its
14 behavior versus a prescriptive requirement.

15 And then lastly; and then I'll ask Jesse
16 to fill in his thoughts on this slide, would be you
17 need to have appropriate training programs,
18 appropriate examination programs to make sure again
19 that the operators are able to fulfill any role that
20 might be expected of them.

21 So, Jesse, if you want to correct anything
22 or clarify?

23 MEMBER MARCH-LEUBA: I have a question.
24 Within this framework do you envision remote operation
25 of a reactor all if all this human factors analysis

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1 satisfies it, or God forbid no operators at all?

2 CHAIR PETTI: Yes, that was my question,
3 too.

4 MR. SEYMOUR: So this is Jesse Seymour.
5 I'm one of the Human Factors and Operator Licensing
6 staff members. So again, without getting into too
7 many of the specifics of our rule language because it
8 hasn't gone out to the public yet, what we currently
9 are working towards is a framework that does not
10 explicitly address remote operation.

11 And, Bill, again you can correct me if I'm
12 mischaracterizing that within the broader Part 53
13 framework.

14 In terms of no operators at all, that is
15 not something that we presently envision. And to
16 clarify that --

17 MEMBER MARCH-LEUBA: But what I'm asking
18 you is will the language allow it if somebody had a
19 question?

20 MR. SEYMOUR: So the current framework
21 that we're working on would essentially require that
22 certain important administrative tasks would always
23 exist and that there would be someone that would have
24 to account for those tasks. So even in a framework
25 that didn't require operators to implement any

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1 preventative or mitigative role for accidents there
2 are still certain important administrative functions
3 that have safety implications that need to get done,
4 and somebody needs to do those. So our intention is
5 to propose a vehicle that would support that.

6 So the way that we currently see it is
7 that you never get to a point to where there is no
8 human involvements, even if a plant can run itself,
9 because people still need to do things like technical
10 specification calls, operability determinations,
11 emergency notifications, departing from the license
12 conditions in the event of an emergency when it's need
13 for the health and safety of the public. There are
14 certain things like that --

15 MEMBER MARCH-LEUBA: But all those --

16 MR. SEYMOUR: -- that can never go away.

17 MEMBER MARCH-LEUBA: But all those
18 functions can be performed remotely. If I'm operating
19 21 megawatt reactors in different locations, I only
20 need one operator centrally located.

21 MR. SEYMOUR: Yes, and I certainly won't
22 argue that point. I mean the logical is true there.
23 It's just a -- it's kind of a self-imposed -- shall we
24 say a restriction on -- the boundaries that we've set
25 for the current framework is that we didn't explicitly

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1 address remote operations. For the most part our work
2 here in Subpart F is silent on that point.

3 Bill, I'm not sure if there's anything --
4 (Simultaneous speaking.)

5 MR. RECKLEY: No. Well, and we had during
6 the development of the white paper -- we have other
7 activities looking at remote operations, but remote
8 operations bring in other considerations such as
9 cyber-security and things that we weren't yet ready to
10 take on. And so --

11 MEMBER MARCH-LEUBA: You brought the magic
12 word; I was going there, cyber security. It's almost
13 impossible to guarantee a two-way connection into a
14 reactor that is safe. It is essentially impossible.

15 MR. RECKLEY: So for that reason, as Jesse
16 said, we're basically planning in this round to be
17 silent on it. Any proposal, were it to be made, would
18 have to tackle all those issues. And we're not aware
19 in the short term that anybody will be pushing to do
20 that in a specific application.

21 MEMBER MARCH-LEUBA: And that's completely
22 relevant, Bill. The whole approach of Part 53 is you
23 want to give flexibility for the irresponsible reactor
24 operators to do bad things. And you should not be
25 silent on it. You should say you cannot do it unless

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1 you have a cyber security plan that allows two-way
2 communications with a reactor protection system, which
3 is impossible.

4 MR. RECKLEY: Well, and for that we have
5 a different activity and a different working group
6 looking at that.

7 MEMBER MARCH-LEUBA: So why doesn't the
8 rule say you don't do remote operations? If a reactor
9 comes and can do it, that's what the exemption process
10 is for. I just don't see this desire, this guide for
11 the Part 53 designers to allow everything they want to
12 do and we'll give you it later on. You should --
13 anything you're not 100 percent sure, the rule should
14 forbid it. Whenever there is information that allows
15 you to do it, get an exemption. I mean --

16 MR. RECKLEY: Okay. Well, what --

17 MEMBER MARCH-LEUBA: You clearly --

18 MR. RECKLEY: As Jesse said, we're getting
19 probably one step ahead because what we're proposing
20 to release in terms of the preliminary language is
21 still under internal review, but this is certainly a
22 discussion and we can continue it in October on the
23 specifics.

24 CHAIR PETTI: Hey, Bill, I have sort of a
25 broader question. Autonomous operation is everywhere,

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1 right? Automobiles, planes. Are you guys in touch
2 with the other government regulators in these other
3 areas, either formally or informally to kind of keep
4 your finger on the pulse of what's going on there just
5 to stay abreast of some of that sort of stuff?

6 MR. RECKLEY: I'll ask --

7 MR. SEYMOUR: Bill, I can probably start.

8 MR. RECKLEY: Yes, go ahead, Jesse.

9 MR. SEYMOUR: Okay. Yes, if you don't
10 mind. And again this is Jesse. I'll kind of start by
11 fielding that question.

12 You know, Bill allude to that we do have
13 a separate project that has begun the investigation
14 into remote operations. And that currently isn't a
15 publicly available product at this point, but one of
16 the aspects of that work was to conduct some
17 benchmarking and interviews with other industries
18 essentially on the government side, the regulatory
19 side of it that deal with automation and specifically
20 like autonomous or remote operations and to probe into
21 those issues. So again, we do have some good
22 learnings from that.

23 What I will say is that that's one
24 example. The things that we've picked up on so far
25 when we take that and we weigh it against kind of the

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1 safety implications of what we're working with here,
2 I think we feel that we're still in a comfortable
3 spot. But again, the specifics of that remote
4 operations report aren't quite out there in the public
5 domain yet.

6 MR. RECKLEY: In addition to that we
7 commissioned a report from Sandia that started to
8 weigh in on this. And then I'll just add from my
9 perspective; and we address this somewhat, or we had
10 Sandia address it somewhat in the paper they provided,
11 there's different ways to think about autonomous, and
12 one is something like an autonomous car which has to
13 get multiple inputs from sensors and make decisions on
14 what to do. And that's kind of a digital autonomy.

15 And then there's another autonomous -- and
16 these can be mixed, but there's another autonomous
17 which can be more mechanical and process related to
18 kind of inherent characteristics of a particular
19 design. And so you might be able to have from the
20 safety side a certain amount of autonomous operation
21 or comfort from inherent features or something that
22 would be either inherent, passive, or whatever term
23 you wanted to use, and then -- but less reliant on
24 artificial intelligence or digital controls to achieve
25 that autonomy. But all of that is stuff that you have

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1 to really think through and see what a particular
2 designer might be proposing.

3 And again, as Jesse said, some of this is
4 the subject of ongoing studies that we've
5 commissioned.

6 MEMBER MARCH-LEUBA: Let me put a personal
7 opinion on the record. Okay? What I hear from you
8 guys is we don't have sufficient information to know
9 whether autonomous operation of a nuclear reactor is
10 a safe condition. We don't have sufficient
11 information to know whether remote operation of a
12 nuclear reactor is safe. Completely irresponsible to
13 write a rule that is silent on what we know, we don't
14 know. It is irresponsible. Okay? It's on the record
15 and you can quote me.

16 MEMBER BALLINGER: I mean; this is Ron
17 Ballinger, you don't have to go very far to discover
18 autonomous operation of even a nuclear plant. Cassini
19 -- go to NASA. Those probes and stuff are all
20 autonomous and they all operate and they all have
21 software and intelligence to decide when something is
22 going wrong and notify the people back here, or
23 wherever they are, that you have X minutes to fix
24 this, otherwise we're going to shut the thing down.
25 So I mean this is not unusual.

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1 MR. SEYMOUR: So if I could I guess
2 provide some clarification, and again with the
3 understand that next month we'll have kind of a full
4 picture out there for everyone's consideration.

5 The framework that we're currently
6 proposing does not rule out the ability for us to look
7 at a potentially autonomous design and to navigate
8 that and to try to do that in a way that we think
9 provides a reasonable assurance of adequate safety.

10 The thing that I want to point out is
11 simply that there are certain administrative
12 responsibilities associated with the operation of that
13 facility that do need to go somewhere, right? And so
14 there is an aspect of that that we have to address.
15 It's a little different when we're taking a
16 radioisotope thermoelectric generator; I believe they
17 call them the RTGs, and we're putting that on a probe
18 and sending it off into space. A little bit different
19 considerations. You don't have the same factors at
20 play necessarily.

21 But we're not excluding the fact that
22 someone could build an autonomous reactor that is able
23 to -- via safety mechanisms that are inherent and
24 passive and so forth to provide us that assurance that
25 without the person right there to take action that

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1 it's going to be safe.

2 What we're saying is that because it's a
3 licensed nuclear facility within this framework there
4 are certain -- and I call the administrative, but not
5 to diminish the safety significance, right, we're
6 talking about things like departing from the license
7 basis in an emergency, making sure that the facility
8 remains compliant with the tech specs so that you stay
9 in that analyzed state at the beginning of an accident
10 and so forth. And it requires someone that has a
11 requisite level of qualification and training that we
12 have an assurance that they're going to be able to
13 implement those.

14 So that's really what we're talking about
15 without having the full specifics here for everyone's
16 consideration. But what we're now saying is that
17 we're just carte blanche not considering the
18 possibility of autonomous operation. That's not the
19 case at all.

20 Bill, I'm not sure if you had anything you
21 wanted to add there.

22 MR. RECKLEY: No. Again we're trying to
23 -- and this is always a challenge when you're trying
24 to do a technology-inclusive and forward-looking
25 rulemaking is we're trying to remain flexible. I hope

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1 people don't confuse that flexibility with any notion
2 that we're predisposed to approve anything. The
3 burden would be on the applicant to show that they are
4 able to fulfill all the functions with whatever number
5 of people and whatever the role they assign to the
6 people, and the absence to do that would mean they
7 wouldn't get a license.

8 And so it's just a challenge. And I
9 understand the feelings, but it is part of the
10 challenge to build in flexibility to a rule. But
11 again, hopefully people don't read that it's any
12 reduction in a burden. Instead of having requirements
13 from which they would need to ask for exemptions;
14 that's a fairly traditional approach, we would just
15 build in the flexibility. But the burden is on them.
16 They have to come up with the concept of operations.
17 They have to come up with the functional requirements
18 and the allocation of the people to meet the
19 functions. They have to come up with the staffing
20 plans and all of that. And they have to justify it.

21 So but in any case, I --

22 (Simultaneous speaking.)

23 MEMBER SUNSERI: Hey, Bill, this is Matt.

24 MR. RECKLEY: Yes, go ahead.

25 MEMBER SUNSERI: Vicki -- Dr. Bier's had

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1 her hand up for a while.

2 MR. RECKLEY: Oh, sorry.

3 MEMBER SUNSERI: You might want to call on
4 here.

5 CHAIR PETTI: Yes, I was going to the same
6 place. Thanks, Matt.

7 MR. RECKLEY: Okay. Go ahead.

8 MEMBER BIER: Thank you. This is in a way
9 kind of related to the previous discussion and in a
10 way broader. So we've kind of learned from TMI and
11 over the years that we do need to have special
12 requirements and research and all the rest of it for
13 human factors, that people are different than
14 engineering and physics and whatever, and we need to
15 study that and control it separately. And it seems
16 like even aside from remote operation of what if
17 somebody doesn't want to have an operator on site --
18 even if there is an operator on site I think we still
19 need to treat sort of computerized or AI-based
20 controls almost the way we treat human factors due to
21 the complexity.

22 And if I were to draw a distinction, there
23 might be some reactors that you claim you can operate
24 without an operator physically there because they're
25 inherently safe by the physics of it. And you may be

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1 wrong about that. You may mis-estimate. You may have
2 some things wrong about the physics or not have
3 considered all the possibilities or whatever, but the
4 physics is pretty well understood relative to claiming
5 that a reactor doesn't need an operator because the
6 computer runs it. And that is not remotely in the
7 same ballpark of as understood as the physics. And it
8 seems like it's kind of right now maybe a little bit
9 of an orphan because it's different than what
10 historically has been done under digital I&C where
11 you're talking about individual sensors and whatever.

12 And so this is not necessarily something
13 that has to be discussed right now because it isn't
14 directly related to Subpart F, but I just wanted to
15 kind of put that on the table for some time whenever
16 is appropriate.

17 MR. RECKLEY: Okay. And it's a good point
18 and there's some discussion in the report we
19 commissioned from Sandia that goes along those lines,
20 that you have to be very careful of that because --
21 well in any case, I'll leave it there.

22 And, Dave, one of the things you might
23 want to consider, or along with us and Derek when
24 we're planning for the October meeting, is how much
25 time to give to this particular section.

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1 CHAIR PETTI: Yes. Yes, good point.

2 MEMBER HALNON: Hey, Bill, this is Greg.
3 I got a quickie, I think. I hope.

4 First of a kind. For these reactors they
5 may be able to justify a very small of operators for
6 the -- but without the operating experience. Are you
7 guys holding your cards such that you can require
8 additional operators for first of a kind without being
9 called backfit and everything else when --

10 MR. RECKLEY: Yes. Yes, first of kind,
11 first number of cycles, first whatever. But yes, we
12 would always have and are holding the possibility that
13 that might be appropriate until you get some operating
14 experience and prove the point that people may be
15 required until you have that operating experience
16 gained.

17 MEMBER HALNON: Okay. Yes. Thanks.

18 MR. RECKLEY: So if we can go onto 76, I
19 think? So in terms of addressing the role of
20 operators, what we're setting out to do is again to
21 make sure that the assessments that would be done by
22 the designers are able to support whatever they're
23 proposing. So the requirements would put the burden
24 on those evaluations to support the finding.

25 And so this is somewhat repetitive, but

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1 the specific areas are the HFE analysis. We are
2 adding some -- or expect to add if it makes it through
3 the reviews some provisions for load following to
4 clarify some points in that area, some points to
5 address online refueling as you move to something like
6 a pebble bed reactor, need to accommodate current
7 requirements that say that it has to be -- specific
8 reactivity additions need to be overseen by a licensed
9 operator. Well, need to allow provisions for the
10 designs that will be different in areas line
11 continuous refueling.

12 And then the last bullet is the one I
13 think we'll talk about a lot in October, and that is
14 the potential for certain facilities to have a
15 different kind of operator, one not necessarily
16 licensed by the NRC if it can be justified and certain
17 specific safety criteria could be satisfied. And as
18 the bullet says, a key consideration would be what is
19 the role of the operator in either mitigating or
20 preventing licensing basis events?

21 But before opening it up I'll just say at
22 this time; and what you'll see I think, assuming it
23 comes out similar to what we have prepared so far, is
24 don't confuse non-licensed with unregulated. And we
25 are looking at other models like certified fuel

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1 handlers where it is a very regulated activity. It's
2 just that the activity is supported by a certification
3 by the licensee. And the NRC oversees those programs
4 and evaluations and doesn't necessarily administer and
5 examine and license the operator per se.

6 But, Jesse, you want to weigh in on this
7 one and then we can --

8 (Simultaneous speaking.)

9 MR. SEYMOUR: Thanks, Bill, I appreciate
10 it. Bill, I think the way that you captured making
11 sure that that distinction is clear that non-licensed
12 does not equal unregulated is important even for a
13 non-licensed equipment operator. And I'll use this
14 example: We still under the existing training rule
15 and what we envision for Part 53 for the equivalent we
16 still anticipate mandating certain training
17 requirements for those individuals.

18 Similarly this other category of operator
19 that we're kind of touching upon here, we see that
20 there's opportunity for us to review and approve the
21 training and examination programs used for such
22 individuals to directly inspect certain aspects of the
23 ongoing program thereafter, but not necessarily to
24 take that operator's qualification to the level of
25 licensing that we necessarily administer. And again,

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1 all that would be tied to the specifics of that design
2 and some pretty rigorous criteria. So that's the
3 point that I had to make there, Bill.

4 MEMBER SUNSERI: Hey, Bill and Jesse, this
5 is Matt. I'm not disagreeing with anything you're
6 saying there, but just think about this for a second;
7 and you don't have to respond do this either, but
8 having operated a plant and having had operators that
9 were licensed by the NRC when you face the public on
10 certain issues being able to say that your operators
11 are licensed by the NRC was a pretty big confidence
12 builder. It at least builds confidence in the public.
13 So don't underestimate the value of that as you think
14 about what changes you want to make here.

15 MR. RECKLEY: Understood. Thank you,
16 Matt.

17 Okay. I think we can move on to 77. So
18 what we're getting to here is that for operator exams,
19 even for the current arrangement and what we expect to
20 see going forward is for the licensed operators it's
21 not necessarily such that every facility would need
22 the same program, the same training, the same
23 requirements. And so even within licensed operators
24 there's a certain flexibility.

25 And that can be seen today. It's a

1 perhaps overused example. I don't like to bring in
2 RTRs too much, but RTRs have licensed operators. And
3 it's understood that the RTRs are operating on
4 different principles, different source terms,
5 different whatever, and the operator licensing program
6 for them is significantly different than it is for a
7 large commercial light-water reactor.

8 And so we're looking that even within this
9 realm there's flexibilities that we would want to
10 build in, and the process to determine and take
11 advantage of that flexibility would be to use things
12 like, as has already been addressed, in an area like
13 NuScale where you do job task analysis to really
14 narrow down on what operators need to do, ensure they
15 can do, what they need to do to evaluate what would be
16 the appropriate training given the complexity of the
17 machine and use the flexibility in terms that exist in
18 terms of our ability to develop and deliver
19 examinations and look at the training programs.

20 In addition to that, the last bullet
21 there, when you're looking at the potential to
22 introduce operators that would not be licensed, that
23 similar approaches could be taken for them in terms of
24 making sure the appropriate training is provided and
25 so forth.

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1 So again, I think this will be a little
2 more clear when we're able to show you in a week or so
3 the preliminary language and you can see how all of
4 this plays out and the similarities that would exist
5 for many of the requirements that would be associated
6 with a licensed operator or an operator that's not
7 licensed by the NRC per se.

8 MEMBER HALNON: So, Bill --

9 MR. RECKLEY: Go ahead.

10 MEMBER HALNON: -- I think one of your
11 bigger challenges here is not so much coming up with
12 a training program or training requirement for this
13 licensed operators. It's going to be keeping the NRC
14 staff up to speed on the many different types of
15 reactors. I mean right now we get inspectors that
16 have gone through generic BWR/PWR training and they
17 may even spend some time of plant-specific simulators,
18 but that brings them up to a pretty high level of
19 knowledge enough to be able to do the inspections and
20 do the training examinations. But I tell you, that's
21 pretty generalized over 100-some reactors. It's going
22 to be interesting to see how the next step on keeping
23 your inspectors and training examiners up to speed to
24 the point where they can confidently inspect and
25 examine the operators.

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1 MR. SEYMOUR: Greg --

2 MR. RECKLEY: Yes, I agree. Operators and
3 the machine -- and I'm sorry, Jesse. I agree with
4 you 100 percent. And that is something that the
5 Agency will just have to be flexible about and see in
6 what direction things go, right?

7 In the extreme you could have many
8 different technologies and different designs for each
9 technology, which would be kind of a worst-case
10 scenario from what you're saying in terms of the need
11 for the NRC to be very familiar with a large number of
12 designs. Or it could evolve differently, in which
13 case it would be less onerous for us.

14 But, Jesse, go ahead. I'm sorry.

15 MR. SEYMOUR: Oh, yes. No. Thank you,
16 Bill.

17 I was just going to say that I agree 100
18 percent with that observation. And just as an aside,
19 up until last year I was an operator licensing
20 examiner on the power reactor side full time, and I
21 still maintain the qualifications for Westinghouse, GE
22 BWRs, B&W, CE, and then also AP-1000. And just trying
23 to maintain the proficiency of knowledge across all
24 those, it's challenging. So one thing that we have
25 discussed internally extensively is how do we craft a

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1 program that now has to be able to address a wide
2 potential variety of technologies up to and including
3 fusion, for example?

4 So there are various options that are
5 there to try to navigate that. Some of those are
6 things that would fall more into guidance space. Some
7 of them we do intend to present, at least kind of at
8 a high level, when we discuss our detailed language in
9 October. But we do have a few options on the table to
10 try to address that, but it's a very valid concern how
11 those -- any one individual maintains that type of
12 knowledge with a reasonable degree of proficiency.

13 MR. RECKLEY: Ron, I see you.

14 MEMBER BALLINGER: Yes, I'm think I'm
15 assuming you're thinking along these lines, but I
16 would think you would need to tread very, very
17 carefully on this training issue. I can see the
18 tension, probably economic tension, between the
19 regulator and the operator wanting to save a little
20 money. But as long as things are going fine having X
21 operators and Y other people that aren't licensed
22 operators, that might work out fine. But if you have
23 a really bad hair day, having somebody there that,
24 while not operating the plant, has the training such
25 that that person knows the plant, that can save your

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1 hide. And so I think from a human factors and
2 training perspective there's -- I think we need to
3 avoid getting too far into the gray area and assuming
4 that our automation is going to save our hide. You
5 can see what I'm saying?

6 MR. SEYMOUR: Yes, I think I see where
7 you're coming from, and the first thing I would point
8 to is that very broadly -- and Bill touched upon this
9 at the beginning, but we're talking about different
10 aspects of people and machines here, but really what
11 we're doing falls under a broader umbrella of a new
12 philosophical tack that we're taking, and that is
13 human system integration as the overarching theme.
14 And the idea is that within this framework that
15 operator licensing and training in general, human
16 factors engineering and staffing are not independent
17 deterministic steps that you're going through. Rather
18 they form a cohesive whole where if you adjust one
19 thing it kind of affects the other thing as well, too.

20 So in this case one of the things that I
21 would point out is that this program would exist in
22 tandem with a flexible staffing program. And that
23 staffing model -- in order to set the number of people
24 one of the things that you would be required to do is
25 to demonstrate human factors engineering-based

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1 analyses and assessments and validations that would go
2 through and demonstrate -- and I'll give an example
3 here, right? One way that that would play out is that
4 you would actually demonstrate that high work load and
5 challenging situations could be navigated by the
6 proposed number of people. And again that's out in
7 guidance space so it's not quite within the rule
8 language per se.

9 But on the development side of things
10 that's how we see that playing out, that ultimately
11 when you have people that are qualified to a certain
12 level of their training program, when you figure out
13 how many of them you need, that there's that step
14 there, right, that you're going to have to go through
15 -- and using kind of tried and true and robust
16 analyses go through and show that that's going to be
17 sufficient to demonstrate a reasonable assurance of
18 safety.

19 MEMBER BALLINGER: Just got to be careful
20 that you don't start -- or allowing, excuse me, the
21 erosion of what we would call -- what I would call
22 margin.

23 MR. SEYMOUR: I understand, and it's --

24 MEMBER BALLINGER: Yes.

25 MR. SEYMOUR: Yes, I do. I understand the

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1 point and I understand the underlying concern there
2 that the margin -- it also -- and I know we talked
3 about uncertainly earlier, right, but if there's
4 uncertainties, right, sometimes that margin can help
5 to offset the uncertainties. So that is an area that
6 we're definitely sensitive to is definitely we don't
7 want to come into this saying what's the absolute bare
8 minimum? We want to say what is going to give us a
9 reasonable assurance of safety given the totality of
10 the design and what we know about it?

11 CHAIR PETTI: So, folks, I think we should
12 keep on moving.

13 MR. RECKLEY: Yes.

14 CHAIR PETTI: I don't know how many slides
15 you have. We haven't even seen the language yet.

16 MR. RECKLEY: Right.

17 CHAIR PETTI: We'll get to look at this in
18 great detail in October.

19 MR. RECKLEY: Right. Right. Thank you,
20 Dave.

21 So the next slides goes to training. We
22 were just talking about that. And you'll see in the
23 language what these requirements are. Actually this
24 is an area -- Jesse, correct me, but this area is --
25 it's very similar to what you might see, albeit like

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1 I said before, in making it technology-inclusive it
2 just maybe raises up a level because it's broader
3 versus very specific things for light-water reactors.

4 And then lastly on slide 79 is we know
5 that this is going to require guidance, and we have a
6 number of activities under way including those that
7 we're getting support from Brookhaven on scalable
8 human factors engineering reviews. We also have some
9 support both internally and with Idaho National Lab on
10 operator licensing exams and how they might be
11 tailored differently for different facilities. Then
12 this also ties into our development of guidance under
13 the advanced reactor content application.

14 So any last thoughts or key things? One
15 area I just wanted to mention is within this whole
16 discussion will also be an assessment of staffing
17 other than those directly associated with operations,
18 like operators, but we do need to look at the role of
19 people in performing other functions. And that will
20 also be addressed to some degree within this part of
21 Subpart F. Technicians, radiation protection people,
22 so forth.

23 So, Jesse, any last thoughts or --

24 MR. SEYMOUR: One item that I did want to
25 point out, Bill, with regards to slide 78; and there's

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1 no need to go back -- you touched upon that it's
2 essentially a variation on the existing 50.120
3 training rule, which itself is driven by statute. And
4 within the context of Part 53, Bill, you were
5 mentioning that we've talked a lot about operators,
6 but just not to gloss over that there's other people
7 that are doing important jobs in these facilities.

8 One thing that we do carry forward is the
9 need to have sound training programs for those
10 relevant categories of individuals. A key difference
11 is that we do have to account for the potential for
12 there to be non-traditional roles, perhaps
13 combinations of responsibilities into a single
14 individual that we haven't seen previously. So we do
15 have to be more flexible in some of the nomenclature
16 and how we choose to categorize people, but we do
17 fully intend to carry forward that requirement that
18 folks that are doing jobs like being radiation
19 protection technicians and so forth will be subject to
20 systematic approaches to training-based training
21 programs.

22 So that's what I just wanted to add there,
23 Bill.

24 MEMBER BROWN: Bill?

25 Did we lose Bill?

1 CHAIR PETTI: I still see him connected.

2 MR. RECKLEY: Yes, I'm sorry.

3 CHAIR PETTI: There we go.

4 MR. RECKLEY: I muted. Go ahead. Sorry.

5 MEMBER BROWN: Yes, just something I
6 didn't bring up earlier, and maybe we've addressed it;
7 I just don't remember. A lot of the discussions we've
8 had on advanced reactor-type stuff, SMRs, small
9 reactors, and even micros I guess, is the potential
10 they'll be located in remote areas which sets up the
11 remote operation philosophy. I don't know what part
12 they would be licensed under. I presume they would be
13 under any one of these if they wanted to. But the
14 remote operation thing may become a factor somewhere
15 along the line. In other words, what do you do when
16 you've got some guy sitting in Chicago managing a
17 plant that's located in the foothills of Wyoming?
18 There's technical issues with that because you're
19 using the Internet. So I don't know how to address
20 it, but is it going to be part of this Part 53
21 discussion under the technical part of it?

22 MR. RECKLEY: Yes, we had talked earlier
23 that we're really not -- we're not addressing it.
24 We're not necessarily precluding it. We're not
25 setting up a vehicle to do it. We have another

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1 working group within the NRC that's looking at that
2 and related issues: as you mentioned, cyber security
3 and so forth. And so we're just kind of shelving or
4 putting that item in the parking lot for right now.

5 MEMBER BROWN: Okay.

6 MR. SEYMOUR: Bill, if I could add to
7 this? This is a point that I'd like to just make
8 again without going too far down the rabbit hole per
9 se.

10 But what I want to say is that with
11 regards to the framework that as of right now we
12 intend to present next month there is no current
13 variation of what we intend to present where a human
14 being is not getting indications from the reactor and
15 has the ability to shut it down, right? That's kind
16 of a concise assessment of what we intend to put on
17 the table next month.

18 So by that what I mean is that even for --
19 the way we presently envision even for a reactor that
20 is running autonomously that there would still be a
21 human being that is receiving indications from it that
22 at a minimum has the ability to turn it off.

23 MEMBER BROWN: No, but they also have the
24 ability to implement or actuate certain things also
25 even though it's autonomous. Autonomous is only good

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1 I mean if you really get it right. I won't even refer
2 to something that happened in the Naval Nuclear
3 Program 60 years ago. So when that thought process
4 was going -- or 65 years ago.

5 But my point being is that even if they're
6 autonomous you still have an operator that can actuate
7 stuff. He would get indications of the plant. You
8 can send that to him. The real issue is how reliable
9 is that? The cyber issues. And then if something
10 happens and you don't have anybody around, how do you
11 deal with that? How are you comfortable with that in
12 a -- even though it's a low or pretty much almost non-
13 populated area? I mean, different circumstances,
14 different issues, different criteria, different safety
15 requirements even possibly. And all I'm hearing is
16 that we haven't -- we've put that aside and we're
17 addressing that separately fundamentally.

18 Is that right, Bill?

19 MR. RECKLEY: Yes, for now. And as Jesse
20 said, we're not -- yes. There's a lot of work to be
21 done before we would be set up to review such a
22 proposal.

23 MEMBER BROWN: Or to even accept it?

24 MR. RECKLEY: Right.

25 MEMBER BROWN: Or get us to accept it?

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1 MR. RECKLEY: So --

2 MEMBER BROWN: Another trial. Okay. All
3 right. I just wanted to make sure it didn't get lost
4 in the --

5 MR. RECKLEY: No. No, it's not lost, but
6 it's such an issue that we also don't want it to kind
7 of derail our current effort. So that's why we're
8 kind of setting it aside, so to speak.

9 MEMBER BROWN: I totally agree with that.

10 MR. RECKLEY: Okay.

11 MEMBER BROWN: I just wanted to make sure
12 that at least the thought process was there. Okay.
13 I'm done. Thank you.

14 MR. RECKLEY: Okay.

15 MEMBER BROWN: Thank you, Bill.

16 MR. SEYMOUR: And what I just want to add,
17 Bill -- again this is Jesse. The same -- there's very
18 similar considerations to what were just discussed,
19 the same types of questions about asking those what-
20 ifs. We've shared almost verbatim many of those same
21 questions in our internal discussion. So even though
22 our current stance is that we have by and large tabled
23 that particular issue for the time being, we've
24 expressed many of those same types of concerns and
25 considerations in our internal discussions.

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1 MR. RECKLEY: Okay. Ron, did you have a
2 question or is it up from earlier?

3 MEMBER BALLINGER: My apologies. I got --

4 MR. RECKLEY: No problem.

5 MEMBER BALLINGER: -- to lower my -- I
6 just lowered my hand.

7 MR. RECKLEY: Okay. So with that, we'll
8 spend the next part of the meeting to go over -- if
9 you want to go down to slide 81? And, Boyce, if
10 you're on, I'll hand it over to you.

11 MR. TRAVIS: Sure. Thanks, Bill.

12 This is Boyce Travis from the DANU
13 Division. I'm in the Advanced Reactor Technical
14 Branch.

15 As part of the -- I guess if we can go
16 onto slide 82. So as part of the broader Part 53
17 effort we've received feedback from stakeholders; and
18 Bill alluded to this earlier, stating that they wanted
19 something that involved a lower reliance on PRA. So
20 we've taken to defining what you saw earlier as a
21 path, the broader Part 53 effort as the PRA in a
22 leading role path. And then separate from that this
23 more deterministic option that's kind of being deemed
24 as the PRA in a supporting role path.

25 And so we're in the -- I was going to say

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1 early stages, but I guess I'll say final stages of
2 initial development for rule language for a
3 deterministic option that incorporates a technology-
4 inclusive set of rules that leverages and supports use
5 of international -- and aligns with international
6 standards, uses the PRA in a supporting role, and does
7 so as kind of a separate path from the Part 53
8 options, or from the Part 53 rulemaking that also
9 incorporates areas from the Part 53 that can be
10 supported by this deterministic option.

11 And so if you move onto slide 83. So as
12 we discussed earlier; Bill kind of teed this up, this
13 deterministic option would include and specifically
14 require applicants consider the single failure
15 criterion, provide principle design criteria using an
16 established standard, whether that is the GDC in
17 Appendix A, the ARDC that have been provided in Reg
18 Guide 1.232, or something that's akin to what's in the
19 IAEA's SSR/2 effectively that look a lot like
20 principal design criteria.

21 We'd also require the kind of interlocking
22 rings of -- like analyses and SSCs to support against
23 various levels of events including AOOs and DBAs,
24 stepping out to beyond-design-basis events in a couple
25 of different categories to align with international

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1 standards, and then stepping out further to severe
2 accidents. In the AOO and DBA range we'd be using a
3 traditional safety-related classification with single
4 failure. As we step out through those rings to
5 beyond-design-basis events and severe accidents the
6 level of qualification of the components would be
7 commensurate with the role they're performing and the
8 analyses would kind of step out to the more best-
9 estimate analysis. And consistent with existing Part
10 50 and 52 guidance this process would use PRA in a
11 confirmatory role and the QHOs, quantitative health
12 objectives, would be -- remain enshrined in guidance
13 rather than specifically put in the rule.

14 If we move onto slide 84. So this option
15 would be -- is currently envisioned to be separate
16 from what is provided in Part 53 in that the leading
17 -- PRA in a leading role would be one path. This
18 path, the PRA in a supporting role would be another.
19 We're not fixed on where this option is going to
20 reside, but currently are thinking it would rely on
21 the existing Part 50 and 52 infrastructure in a lot of
22 cases, but we would leverage flexibility in areas in
23 the Part 53 rulemaking to have a more dose-oriented
24 focus such as emergency preparedness, siting, and
25 security.

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1 And we would allow applicants to use the
2 Part 53 scope for these sub-areas while providing a
3 more traditional deterministic analysis that looks we
4 believe and will be similar to what -- inform to what
5 we would see today from a Part 50 or 52 applicant with
6 the caveat that we'd be providing a framework that is
7 a little more conducive to international standards
8 such as the IAEA and is technology-neutral rather than
9 focused on LWRs.

10 Some of these shared aspects could include
11 things like allowing for further flexibility in
12 meeting codes and standards such as through the use of
13 alternatives to NQA-1 while still conforming with
14 Appendix B. And we've planned to include a functional
15 containment concept directly in the rule to
16 accommodate the technology-inclusive nature of what
17 we're discussing.

18 Move onto slide 85. So as I noted
19 earlier, the rule is in the final stages of initial
20 development internally to the staff. It's something
21 we plan to put out publicly fairly soon, sometime in
22 October I would expect, and have a discussion with
23 ACRS as well. Areas that are in there include:
24 requiring PCs, as I noted; specific analytical
25 requirements for AOs and DBAs, including providing

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1 for the option to use a bounding analysis for some or
2 all of the accident analysis up to an including an MHA
3 like as is done in NUREG-1537 for the RTRs. Then we'd
4 step out to having analytical requirements for a class
5 of beyond-design-basis events.

6 This would be the category of events that
7 would encompass like SBO and ATWS, but also include
8 other events that are in that same sort of frequency
9 range I'll say. I mean this is -- the PRA Is in a
10 supporting role. I'm using that frequency kind of as
11 a guidepost so to speak in terms of the severity of
12 the accident, I guess. And these events would have
13 analytical requirements and SSC quality requirements
14 more commensurate with the frequency and severity of
15 the events and would incorporate the kind of defense-
16 in-depth level 3 or 3a from the IAEA or international
17 nomenclature.

18 And finally, there would be a severe
19 accident layer consistent with the NRC's policy
20 statement, but providing technology-neutral language.
21 Again we'd be looking to incorporate some of the
22 international concepts related to defense-in-depth
23 level 4 or 4b for this. And this would be the area
24 that would align with the existing dose requirements;
25 i.e., the siting and 25 rem requirements.

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1 So if we move to the next slide. So to
2 move forward with this option, as I noted the staff
3 has developed rule language. We're in the process of
4 engaging stakeholders, management, and the Commission
5 on what constitutes the most appropriate approach
6 here.

7 As I noted, we're still assessing the
8 placement of where this would go. Right now we've
9 used the Part 50 and 52 regulations as a baseline, but
10 we recognize there are a number of pathways we could
11 take to put this into rule language, and so we're
12 still exploring that. And we're reviewing the impact
13 of the required work to develop the framework on the
14 NRC schedule and resources.

15 We have some initial language, but it's
16 far from complete. As I noted where this goes is
17 going to dictate some of that schedule and resources
18 that's going to be developed and where this needs to
19 make new rules versus where we can rely on existing
20 rules will also inform that effort.

21 So if you move onto the next slide. That
22 is the end of the discussion on this. I expect there
23 are questions and I will open the floor to the ACRS.

24 MEMBER HALNON: Yes, this is Greg. Is the
25 intention to allow cherry picking between the two or

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1 it's either one or the other?

2 MR. TRAVIS: This would be a -- I mean
3 I'll speak -- from all the discussions we've had
4 internally these would be pathways that would branch
5 very early in your licensing process. You would have
6 to choose one or the other.

7 MEMBER HALNON: Thanks.

8 CHAIR PETTI: So I have a question,
9 Travis. Does this -- Boyce. Sorry --

10 MR. TRAVIS: I get it all the time. Don't
11 worry.

12 CHAIR PETTI: Yes. Does this look closer
13 to research in test reactor framework or closer to say
14 Part 50 framework, or do you see it as right down the
15 middle?

16 MR. TRAVIS: I would say it's more than 90
17 percent closer to the Part 50 framework. It's not a
18 one for one because -- I mean, so the language in 50
19 and 52 in some cases is a single sentence for a
20 requirement, an analytical requirement that we maybe
21 expand on in the rule language that we envision here.
22 It wouldn't constitute new requirements, but it would
23 kind of more better explain the analytical and SSC
24 quality requirements associated with different
25 classification of event components. And so in that

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1 respect it is very much -- draws heavily on the
2 existing 50 and 52 framework.

3 CHAIR PETTI: So again, I just -- and help
4 me because I may be wrong. I thought that the
5 feedback that you guys had obtained from the
6 stakeholders was many of the -- let's call them SMR-
7 sized systems were going to use what's a part of an
8 LMP and the stakeholders that wanted something simple
9 were down with the more micro reactor vendors. And I
10 think they were maybe hoping for something closer to
11 research test reactors because the hazards are
12 similar. But that's not where you're going. So I
13 think it would be interesting to see what sort of
14 response you get from stakeholders.

15 MR. TRAVIS: Yes, so before I move onto
16 other questions I just want to kind of modify what I
17 said a little bit. This approach would allow for a
18 number of different options under this framework.
19 Again the requirements are at a fairly high level. It
20 could for a simple reactor -- the corresponding
21 analysis could be simple to meet some of these
22 requirements.

23 They are more deterministic in nature and
24 they lay out a set of I'll say guardrails for the
25 different event classes that you need to fill in --

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1 color within the lines so that we can determine that
2 you can -- the staff has reasonable assurance that you
3 can construct, build, operate, and maintain the
4 facility at the levels that you've provided. But how
5 you do that for a simple small reactor could involve
6 less analysis and less -- I mean, this approach would
7 allow for less analysis in some cases if you could
8 demonstrate that level of safety.

9 CHAIR PETTI: Yes, and would you guys; and
10 I know this is early, have any plan for tabletopping
11 some of this? I think about the heat pipe reactor
12 which is so different than any of the systems that
13 we've seen. I mean, you guys have -- there have been
14 tabletops for salt and sodium and gas, but heat pipe
15 is a little different and -- to make sure you don't
16 miss something, you know?

17 MR. TRAVIS: Yes, I guess I'll say the NRC
18 participated in tabletop exercises, but those were
19 voluntary activities conducted by applicants with
20 relatively extensive technological knowledge on those
21 designs. I don't know if anyone from the staff has
22 more to provide than that.

23 Bill, maybe?

24 MR. RECKLEY: No, I mean we have observed
25 some of those, but I think what Dave would be talking

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1 about would probably be more substantial than what we
2 sat in for eVinci, for example.

3 CHAIR PETTI: Right. Right. Yes.
4 Thanks.

5 MS. VALLIERE: And, Dave, this is Nan
6 Valliere. I just wanted to add one thought to your
7 comment about who's requesting the deterministic
8 options. And Bill alluded to this, or I guess it was
9 Boyce that alluded to this earlier that one of the
10 reasons; and frankly one of the reasons we're really
11 pursuing this, is that some designers want to pursue
12 reactors on international markets, and some of those
13 designers who have made those comments have been SMRs.

14 CHAIR PETTI: Okay. Good to know.
15 Thanks.

16 MEMBER REMPE: I'm hearing silence, so I'm
17 going to go next unless somebody wants to get ahead of
18 me.

19 Earlier in the meeting today there was an
20 exchange between Vesna and me and I'm looking at your
21 slides and I'm still confused. It's very fuzzy, and
22 maybe that's because you haven't decided yet with what
23 the language will be in this new option, but is it
24 possible to come in without something that sort of
25 looks like a PRA to select the maximum credible

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1 accident? Because the slides don't -- it says some
2 people are trying to not have a PRA or they just want
3 to use it for confirmatory behavior.

4 Now for confirmatory behavior that's fine
5 with me, but to not have a PRA or something that looks
6 sort of like it, and it doesn't need to have the QA
7 required for when it's submitted to the NRC, but
8 something that's -- has the structure. And that's
9 what Vesna was emphasizing in her vision. That I
10 think is important. Where are you guys going with
11 this because it's still not clear to me?

12 MR. TRAVIS: So, I'll take a crack at that
13 and if it doesn't answer your question, we can have
14 someone else give it a go.

15 As is currently envisioned for this
16 deterministic option, we would be consistent with the
17 existing Part 50 and 52 rulemaking and the
18 Commission's policy on PRA such that we would require
19 applicants to have a PRA and we would expect that risk
20 insights would be used to inform the design,
21 construction, operation such that there's an extremely
22 low probability of accidents and an extremely low
23 probability of significant release of radioactive
24 material, but we wouldn't be specifying a use case for
25 the PRA or -- I mean in effect there would need to be

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1 a PRA. The level of the staff's review would be
2 commensurate with the use of that PRA in their
3 application and there would be no formal requirements
4 on how that PRA would be used.

5 MEMBER REMPE: So although they're going
6 to an alignment of Part 50 and 52, Part 50 folks in
7 the old days did not have to have a PRA, right?

8 MR. TRAVIS: That is correct. Same for
9 the Commission Policy Statement on PRA. As you're
10 probably aware all of the existing Part 50 and 52
11 applicants for power reactors have a PRA in some form
12 or fashion. And it is used in other cases such as in
13 the Oversight Program and in informing various rules
14 within Part 50 that is it advantageous for an
15 applicant to have a PRA? And so yes, while it is
16 technically true that as of right now a Part 50
17 applicant does not have a regulatory requirement to
18 have a PRA, the Commission has an expectation that
19 they will. And the Part 50 and 52 rulemaking that is
20 going on right now would bring those concepts into
21 alignment.

22 MEMBER REMPE: Right. So then I think --
23 I hope the wording that you come up with will make it
24 clear it is expected or that an applicant will have a
25 PRA and the review will be commensurate with the use.

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1 That would be okay, but to not have it clearly out
2 there I think would be problematic. But we see what
3 you guys come up with.

4 And the other thing is will it be that
5 it's -- it's not really submitted but it's there for
6 review if they want to do it is your vision on this,
7 or is that too far in the details to know yet on how
8 the staff would have access to this PRA?

9 MR. TRAVIS: I'd like to say it's too far
10 in the details, but I definitely wouldn't -- I would
11 expect it to be more consistent with what we see now
12 where it's not submitted, where there's a report or
13 something to that effect. But I think beyond that it
14 is down in the details. Between the rule language and
15 the practical implementation it's a little far afield
16 for me to envision exactly how it's going to work. So
17 I apologize for that.

18 MEMBER REMPE: That's fine. I just am
19 thinking about what's coming down the pike. Thank
20 you.

21 MR. SEGALA: This is John Segala from NRR
22 Advance Reactors. I just wanted to add for Joy's
23 benefit, we kind of have three pathways going on. We
24 have the Part 53 PRA in a lead role and then we have
25 the effort that Boyce is working on. And there's a

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1 group of people working with him on this more
2 traditional deterministic approach with PRA in a
3 supporting role. And then we have a third working
4 group that's off looking at a more conservative
5 bounding deterministic approach using an MHA and
6 whether we could use methods such as integrated safety
7 assessments, ISAs, things like that maybe in lieu of
8 a PRA. That effort is much earlier, is not as far
9 along as the effort that Boyce is working on. It's
10 something that we're looking at the feasibility of it
11 now.

12 So we're kind of looking at the three
13 different pathways based on the feedback we've gotten
14 from stakeholders. We have the lead role is for
15 people that may be interested in using the Licensing
16 Monitorization Project. The traditional deterministic
17 PRA in a supporting role might be people that want to
18 go international with their designs first and then
19 come to the U.S. and not have to redo their whole
20 application. And then this third feasibility approach
21 on the bounding deterministic MHA approach we're
22 looking at for the really small simple designs and to
23 see if there's something that we can accommodate
24 there.

25 I don't know if that -- does that help

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1 answer your question?

2 MEMBER REMPE: Well, then, yes, we're back
3 -- yes, there is -- you're -- it's way -- it's a small
4 effort, but yes, you are thinking about allowing them
5 to do this, which I think that was what you heard from
6 the stakeholders, some of them, that they wanted that,
7 too. And so we'll see where it goes, but I think it
8 will impact your schedule to get this done and
9 included into the Part 53 language.

10 MEMBER DIMITRIJEVIC: This is Vesna again.
11 I just want to say I didn't really engage too much
12 today because it was my feeling, and you can tell me
13 if I'm wrong, that you guys just right breaking this
14 into the PRA leading, with the PRA supporting, and you
15 didn't really -- you're not far in development of
16 this. So I sort of like say okay, this is in the
17 pioneering phases of development. But this was the
18 first time I heard that you have -- a third approach
19 will be pure deterministic because I thought you
20 called deterministic one way that PRA is in supporting
21 role.

22 So basically if you will have a
23 deterministic approach does that mean that you're
24 going to have a technology-inclusive risk-inform and
25 technology-inclusive non-risk-informed application?

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1 Because you know you cannot have a risk-informed
2 application which is deterministic completely. I mean
3 that doesn't make any sense. So -- and a risk-
4 informed, it's not risk-based. It is informed because
5 the PRA and deterministic are sort of married
6 together.

7 Now who takes the leading role can be
8 different and you can have application with takes that
9 -- where the PRA takes the leading role and the
10 application with deterministic takes the leading role,
11 but they have to be together. So I mean I don't see
12 how can you have a third approach, but I didn't even
13 realize this until this moment. So am I right that
14 this is something you're just developing now and you
15 are not yet there to present how you visualize this is
16 going to look like?

17 MR. TRAVIS: So I'll try and characterize
18 this appropriately. What John just discussed -- there
19 are three options under consideration. The first is
20 the PRA in a leading role, and that can be seen in the
21 Part 53 language that Bill has discussed, the
22 extensive Part 53, all the subparts, et cetera.
23 That's PRA in a leading role, heavily informed by the
24 Licensing Modernization Project.

25 The option that I just talked about would

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1 be the PRA in a supporting role. What's being
2 referred to here is deterministic and I think that's
3 where some of the confusion may arise in that it's a
4 more traditional option that uses PRA insights to
5 confirm deterministic design criteria and safety
6 analysis that are guided by things like the single
7 failure criterion prescribed design conditions.

8 Then as you noted, there is a third option
9 very much in the nascent stages being explored by the
10 staff which is a more -- I'm about to use the word
11 deterministic, and that's not the correct word here --
12 an approach is more centered on a worst-case
13 consequence-oriented approach that would not involve
14 a PRA or involve a PRA in a substantially smaller role
15 than either of the two things that we just talked
16 about and that might involve things like integrated
17 safety assessments and other ways to assess plant
18 safety focused on consequences. That approach is
19 still very much early in development and we do not
20 have language to share or -- and was not covered by
21 the slides that you saw today in large part.

22 MEMBER DIMITRIJEVIC: Then you will have
23 to come with some really names which better reflect.
24 I think you're talking about some simplified approach
25 when you're not taught that your logical content

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1 cannot cause the severe accidents and things like
2 that. So but you don't need to develop too much of
3 these details.

4 The other thing which I want to mention,
5 given that I'm European and I work for French company
6 for long part, when you talk about the international
7 look on the PRA, you should really take step back.
8 You have -- the NRC have always been leader
9 internationally when it comes to the PRA since '95 in
10 the PRA role. And now stepping back to satisfy that,
11 that would not make any sense. Europe for example was
12 always going two step behind the regulation when it
13 comes to the risk-informed application and things like
14 that. And I think that actually stepping back would
15 be real step back. So I just want to mention that.
16 Okay?

17 I was actually always proud of the NRC
18 lead in -- U.S. lead in the PRA development.

19 MR. TRAVIS: I think we appreciate your
20 comment and I think we're just trying to be as
21 responsive as possible to the needs across a very
22 diverse spectrum of applicants and stakeholders.

23 CHAIR PETTI: Any other comments, members?
24 I know it's getting late and it's been a long day.

25 MEMBER DIMITRIJEVIC: But we are done.

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1 CHAIR PETTI: Yes. So I just want to
2 thank you, Bill, Nan, Boyce and others, for these
3 marathon sessions. Your ability to do this for so
4 long is really good. Even though we had a hiccup at
5 the beginning, we made it through. I think we really
6 look forward to the October meeting where we're going
7 to be able to discuss these last few items in more
8 detail.

9 With that said and hearing no other
10 comments, let's adjourn the meeting and call it a day.
11 Thank you.

12 (Whereupon, the above-entitled matter went
13 off the record at 5:26 p.m.)
14
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Advisory Committee on Reactor Safeguards (ACRS) Future Plant
Designs Subcommittee

10 CFR Part 53
“Licensing and Regulation of
Advanced Nuclear Reactors”

September 23-24, 2021

September 23rd Agenda

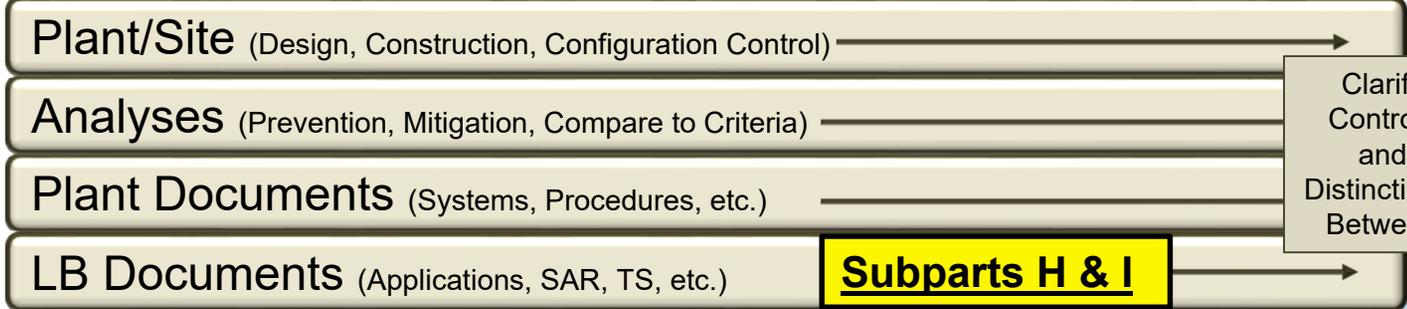
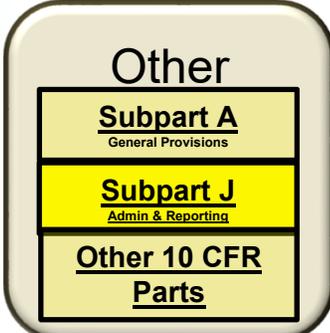
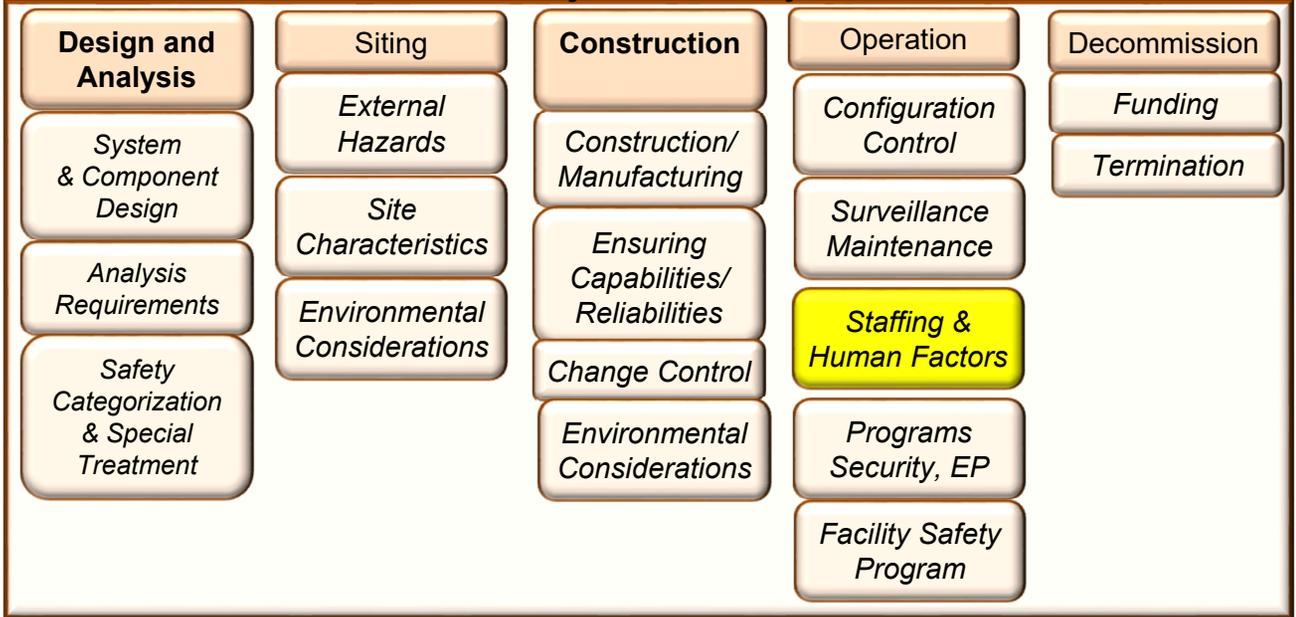
9:30am – 9:40am	Opening Remarks & Staff Introductions
9:40am – 1:00pm	Subpart B – Technology-Inclusive Safety Requirements; Subpart C – Requirements for Design and Analysis
1:00pm – 2:00pm	Lunch Break
2:00pm – 3:15pm	Subpart H – Licenses, Certifications, and Approvals
3:15pm – 4:30pm	Subpart I – Maintaining and Revising Licensing Basis Information
4:30pm – 4:45pm	Break
4:45pm – 5:50pm	Subpart J - Reporting and Other Administrative Requirements
5:50pm – 6:00pm	Discussion

NRC Staff Plan to Develop Part 53



← Project Life Cycle →

- Requirements Definition**
- Safety Objectives
 - Safety Criteria
 - Safety Functions



Clarify Controls and Distinctions Between

NRC Staff Engagement Plan

ACRS Interactions

	Framework	Safety Criteria	Design	Siting	Construction	Operations	Decommissioning	Licensing	General/Admin
Sept 20									
Nov 20									
Dec 20									
Jan 21									
Feb 21									
Mar 21									
Apr 21									
May 21									
Jun 21									
Jul 21									
Aug 21									
Sept 21									
Oct 21									
Nov 21	Consolidated Rulemaking Package								
Dec 21	Consolidated Rulemaking Package								
Jan 22	Consolidated Rulemaking Package								
Feb 22	ACRS Full Committee								
Mar 22									
Apr 22									
May 22	Draft Proposed Rulemaking Package to the Commission								
Jun 22									
Jul 22									
Aug 22									
Sept 22									
Oct 22									

	Concept/Introduction
	Discussion
	Interim Staff Resolution

Part 53 Licensing Framework and Subpart Structure

Part 53 Licensing Framework and Subpart Structure

- Subpart A, General Provisions
- Subpart B, Technology-Inclusive Safety Objectives
- Subpart C, Design and Analysis
- Subpart D, Siting Requirements
- Subpart E, Construction and Manufacturing Requirements
- Subpart F, Requirements for Operation
- Subpart G, Decommissioning Requirements
- Subpart H, Applications for Licenses, Certifications and Approvals
- Subpart I, Maintaining and Revising Licensing Basis Information
- Subpart J, Reporting and Administrative Requirements

Part 53 Licensing Framework and Subpart Structure

Requirements for both normal operations and licensing basis events (LBEs)	
Safety objective	Limit the possibility of an immediate threat to the public health and safety (§ 53.200)
Safety functions	Primary safety function: limit release of radioactive material during normal operations and LBEs. Additional safety functions (e.g., controlling heat generation, heat removal, and chemical interactions) must be defined. Both primary and additional safety functions are required to meet the safety criteria and are fulfilled by design features and programmatic controls. (§ 53.230)
Requirements for normal operations (i.e., “routine operations” or “planned events”)	
Safety criteria	Comply with public dose limits in Part 20. Meet ALARA. (§ 53.260)
Design features	Design features must be defined for each advanced nuclear plant such that the plant will satisfy § 53.260 (§ 53.425)
Functional design criteria	Functional design criteria must be provided to show that § 53.260 dose limit is met (§ 53.425)

Part 53 Licensing Framework and Subpart Structure

Requirements for LBEs (i.e., “unplanned events” and including AOOs, “DBEs,” DBAs, and “BDBEs”) (§ 53.240)		
	DBAs	LBEs that are not DBAs
LBE classifications (§ 53.020)	<p><u>Design basis accidents</u> (DBAs)</p> <p>DBAs are derived from design basis events (DBEs) but assume that only safety related SSCs remain functional to respond to accidents.</p> <p>(§ 53.020, § 53.450(f))</p>	<p><u>Anticipated operational occurrences</u> (AOOs)</p> <p><u>Unlikely event sequences</u> (known in the Licensing Modernization Project (LMP) as DBEs)</p> <p><u>Very unlikely event sequences</u> (known in the LMP as beyond design basis events (BDBEs))</p>
Safety criteria	<p>25 rem total effective dose equivalent [i.e., 10 CFR 50.34 dose limit] for events with an upper bound frequency greater than 1×10^{-4} at exclusion area boundary (EAB) (§ 53.210)</p>	<p>Ensure that LBEs are addressed and provide DID, and maintain overall cumulative risk from LBEs such that potential for immediate health effects remains below 5×10^{-7} and latent health effects remains below 2×10^{-7} [i.e., <i>Quantitative Health Objectives (QHOs)</i>] (§ 53.220)</p> <p>Alternative criteria may be used. (§ 53.470)</p>
Structures, systems, and components (SSCs) responding to the LBE	Safety related SSCs (§ 53.020)	Take into account the expected responses (successes and failures) of all SSCs within the plant, regardless of safety classification (§ 53.020)
Design features	Design features must be defined for each advanced nuclear plant such that the plant will satisfy §§ 53.210 and 53.220. Design features ensure safety functions (§ 53.230) are fulfilled during LBEs. (§ 53.400)	
Functional design criteria	Functional design criteria must be defined per § 53.400 to show § 53.210 is met (§ 53.410)	Functional design criteria must be defined to show § 53.220 is met (§ 53.420)
Analysis	Use a probabilistic risk assessment (PRA) to identify the DBEs and then use deterministic methods to analyze DBAs and demonstrate compliance with safety criteria in § 53.210 (§ 53.450(f))	All LBEs must be analyzed in PRA. Analysis must demonstrate compliance with safety criteria in § 53.220 and “evaluation criteria” per § 53.450(e). (§§ 53.450(a) and (e))
Defense in depth (DID)	N/A -- not directly considered in establishing DBAs (DID for DBAs is provided for by addressing the other LBEs)	DID is necessary for SSCs relied upon to meet safety criteria in § 53.220 or safety functions in § 53.230 (§ 53.250)
Special treatment (§ 53.020)	Tech specs, quality assurance (QA) programs, etc.	Licensee programs

ACRS Interim Letter (May 30, 2021)

CONCLUSIONS AND RECOMMENDATIONS

1. The overall structure of Subparts A through I provides a logical framework for the rule. It is complete with respect to topics that must be covered and addresses the lifetime of a power reactor. It will be helpful to all applicants and to the NRC staff. *(maintained structure)*
2. A coherent and detailed explanation of the integrated intent of the rule and its associated design-specific guidance should be developed as soon as possible and enshrined in the rule itself. *(working)*
3. Subpart B, “Technology-Inclusive Safety Requirements,” is coming together, but we would like to offer a few specific comments and see some further improvements:
 - a. To this point in the development, we find no value in the two-tiered approach to safety requirements. Alternative integral risk criteria to the quantitative health objectives (QHOs) should be investigated. *(Subpart B, revised)*
 - b. Desired flexibility to address the broad range of technologies and power levels is provided by establishing high-level safety criteria that must be assured in top-down fashion as the applicant identifies needed lower-level safety functions. This allows novel technologies to make their safety case specific to their designs, while still precluding release of radioactive materials from the facility. *(Subpart B)*
 - c. The rule should include a set of over-arching general principles in one place (Subpart B) *(working, largely related to quality assurance requirements)*

ACRS Interim Letter (continued)

- d. The rule should state that safety analyses must demonstrate that for normal operation and anticipated operational occurrences (AOOs) all safety related barriers to release are maintained. *(Subpart C, revised)*
 - e. The rule should state that safety analyses must demonstrate that Design Basis Accidents (DBAs) achieve and maintain a safe, stable, and subcritical condition. *(Subparts C & D, revised)*
4. Subpart C, “Design and Analysis Requirements,” is generally in good shape.
- a. The requirement for risk-informed analysis is appropriate if the use of probabilistic risk assessment (PRA) is approached in a graded fashion commensurate with the potential consequences and the simplicity of the design. *(Subpart C and working on changes to support more deterministic alternative)*
 - b. The requirements for selection and analysis of DBAs must be clarified. *(Subpart C, revised)*
 - c. The rule eliminates single failure criteria but needs to define the process that replaces it. *(working)*
5. The two recommendations in our first letter report on 10 CFR Part 53 of October 21, 2020, still apply: for novel designs with uncertainties due to incompleteness in the knowledge base, systematic searches for hazards, initiating events, and accident scenarios should be required; and a licensing pathway including additional testing and monitoring akin to prototype testing should be available. *(Subpart C and Subpart H)*

Part 53 General Layout

- Subpart A, General Provisions
- **Subpart B, Technology-Inclusive Safety Objectives**
- Subpart C, Design and Analysis
- Subpart D, Siting Requirements
- Subpart E, Construction and Manufacturing Requirements
- Subpart F, Requirements for Operation
- Subpart G, Decommissioning Requirements
- Subpart H, Applications for Licenses, Certifications and Approvals
- Subpart I, Maintaining and Revising Licensing Basis Information
- Subpart J, Reporting and Administrative Requirements

Subpart B – Technology- Inclusive Safety Requirements 3rd Iteration

Third Iteration of Subparts B & C

- An important note for this iteration is that the staff is actively assessing various alternative design/licensing approaches to address comments that the rulemaking should support methodologies that are less reliant on PRA.
- The development of recent subparts (including this iteration of Subparts B and C) primarily reflects a risk-informed, PRA-centered approach.
- The staff is developing alternative approaches and related preliminary rule sections for a future iteration that can be considered by and discussed with the ACRS

Subpart B – Technology-Inclusive Safety Requirements

§ 53.200, “Safety Objectives”

Each commercial nuclear plant must be designed, constructed, operated, and decommissioned to **limit the possibility of an immediate threat to the public health and safety**. In addition, each commercial nuclear plant must **take such additional measures as may be appropriate when considering potential risks** to public health and safety. These safety objectives shall be carried out by meeting the safety criteria identified in this subpart.

- No changes from the previously released preliminary language other than a conforming change related to referring to “commercial nuclear plant” licensed under this part versus “advanced nuclear plant.”

Subpart B – Technology-Inclusive Safety Requirements

§ 53.210, “Safety Criteria for Design Basis Accidents”

Design features and programmatic controls must be provided for each commercial nuclear plant such that analyses of design basis accidents in accordance with § 53.240 demonstrate the following:

- (a) An individual located at any point on the boundary of the exclusion area for any 2-hour period following the onset of the postulated fission product release would not receive a radiation dose in excess of 25 rem (250 mSv) total effective dose equivalent; and
- (b) An individual located at any point on the outer boundary of the low population zone who is exposed to the radioactive cloud resulting from the postulated fission product release (during the entire period of its passage) would not receive a radiation dose in excess of 25 rem (250 mSv) total effective dose equivalent.

- Section titles changed to “Safety Criteria for Design Basis Accidents” to address numerous comments related to the use of “first tier” and “second tier” safety criteria.
- Intended to better describe the role of the two categories of safety criteria, the relationship between these safety criteria and the different types of LBEs, and the relationship to later sections in Subpart B and C.
- Normal operations moved to dedicated section (also for § 53.220)

Subpart B – Technology-Inclusive Safety Requirements

§ 53.220, “Safety Criteria for Licensing Basis Events Other than Design Basis Accidents”

Design features and programmatic controls must be provided to:

- (a) Ensure plant structures, systems and components (SSCs), personnel, and programs provide the necessary capabilities and maintain the necessary reliability to address licensing basis events in accordance with § 53.240 and provide measures for defense-in-depth in accordance with § 53.250; and
- (b) Maintain **overall cumulative plant risk** from licensing basis events such that the risk to an average individual within the vicinity of the plant receiving a radiation dose with the potential for immediate health effects remains below five in 10 million years, and the risk to such an individual receiving a radiation dose with the potential to cause latent health effects remains below two in one million years

- Section titles changed to “Safety Criteria for Licensing Basis Events Other Than Design Basis Accidents” to address numerous comments related to the use of “first tier” and “second tier” safety criteria.
- **Intended to better describe the role of the two categories of safety criteria**, the relationship between these safety criteria and the different types of LBEs, and the relationship to later sections in Subpart B and C.

Subpart B – Technology-Inclusive Safety Requirements

§ 53.230, “Safety Functions”

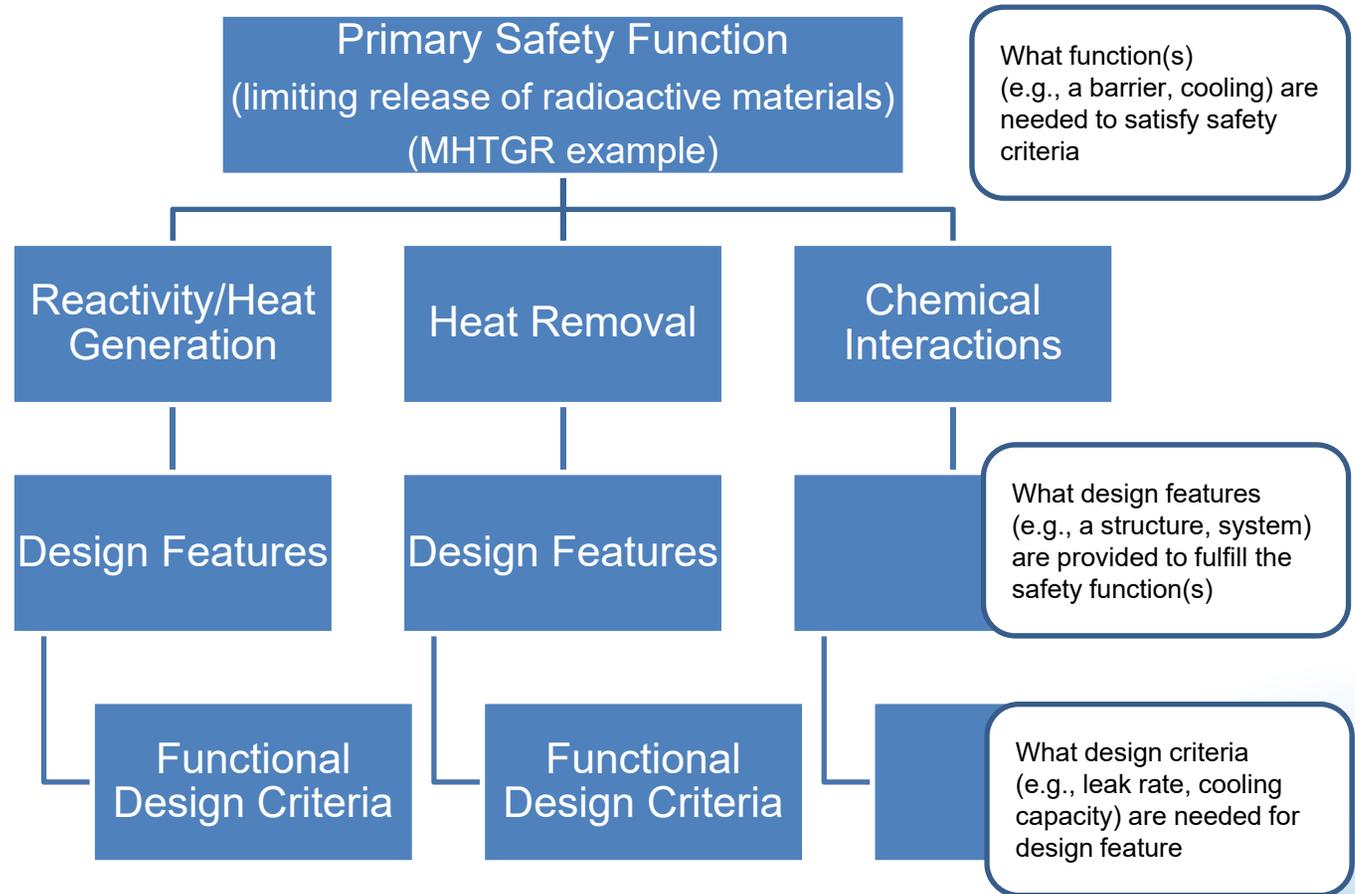
(a) The primary safety function is limiting the release of radioactive materials from the facility and must be maintained during routine operation and for licensing basis events over the life of the plant.

(b) Additional safety functions supporting the retention of radioactive materials during licensing basis events—such as controlling heat generation, heat removal, and chemical interactions--must be defined.

(c) The primary and additional safety functions are required to meet the safety criteria defined in §§ 53.210 and 53.220 and are fulfilled by the design features and programmatic controls specified throughout this part.

- Conforming changes to reflect changes to §§ 53.210 and 53.220.
- Reactivity included within heat generation at this level and addressed more specifically within Subpart C for those functions related to the reactor core

Technology-Inclusive Methodology



Subpart B – Technology-Inclusive Safety Requirements

§ 53.240, “Licensing Basis Events”

Licensing basis events must be identified for each commercial nuclear plant and analyzed in accordance with § 53.450 to support assessments of the safety requirements in this subpart. The licensing basis events must address combinations of malfunctions of plant SSCs, human errors, and the effects of external hazards ranging from anticipated operational occurrences to very unlikely event sequences with estimated frequencies well below the frequency of events expected to occur in the life of the commercial nuclear plant. **The analysis of licensing basis events must include analysis of one or more design basis accidents in accordance with § 53.450(f).** The analysis of licensing basis events must be used to confirm the adequacy of design features and programmatic controls needed to satisfy safety criteria defined in §§ 53.210 and 53.220 and to establish related functional requirements for plant SSCs, personnel, and programs.

- Conforming changes to reflect changes to §§ 53.210 and 53.220.

Subpart B – Technology-Inclusive Safety Requirements

§ 53.250, “Defense in Depth”

Measures must be taken for each commercial nuclear plant to ensure appropriate defense in depth is provided to compensate for uncertainties such that there is high confidence that the safety criteria in this subpart are met over the life of the plant. The uncertainties to be considered include those related to the state of knowledge and modeling capabilities, the ability of barriers to limit the release of radioactive materials from the facility during routine operation and for licensing basis events, and those related to the reliability and performance of plant SSCs and personnel, and programmatic controls. No single engineered design feature, human action, and or programmatic control, no matter how robust, should be exclusively relied upon to meet the safety criteria of § 53.220 or the safety functions defined in accordance with § 53.230.

- Only conforming changes

Subpart B – Technology-Inclusive Safety Requirements

§ 53.260, “Normal Operations”

(a) Maximum public dose. Licensees under this part must ensure that the contribution to total effective dose equivalent to individual members of the public from normal plant operation does not exceed the public dose limits provided in Subpart D to 10 CFR part 20.

(b) As low as reasonably achievable. Design features and programmatic controls must be established such that the estimated total effective dose equivalent to individual members of the public from effluents resulting from normal plant operation are as low as is reasonably achievable in accordance with 10 CFR part 20 [consider also possible updates for consistency with requirements in 10 CFR 50.34a, Appendix I to part 50, and 40 CFR part 190].

- Added as a result of the removal of normal operations from §§ 53.210 and 53.220.
- The reorganization of the preliminary rule language does not change the technical requirements from those included in the previously released preliminary rule language.
- Paragraph (a) refers to licensees in recognition that requirement is actual plant performance measure

Subpart B – Technology-Inclusive Safety Requirements

§ 53.270, “Protection of Plant Workers”

(a) Maximum occupational dose. Licensees under this part must ensure that radiological dose to plant workers does not exceed the occupational dose limits provided in subpart C to 10 CFR part 20.

(b) As low as reasonably achievable. As required by Subpart B to 10 CFR part 20, design features and programmatic controls must, to the extent practical, be based upon sound radiation protection principles to achieve occupational doses that are as low as is reasonably achievable.

- Renumbered and includes conforming changes to reflect the proposed revisions in previous sections.
- Section 53.270(a) is revised to require “licensees under this part” to ensure that the dose to plant workers does not exceed limits in 10 CFR Part 20 and in recognition that only a combination of design features and programmatic controls can ensure actual worker doses remain below Part 20 limits.

Discussion

Part 53 General Layout

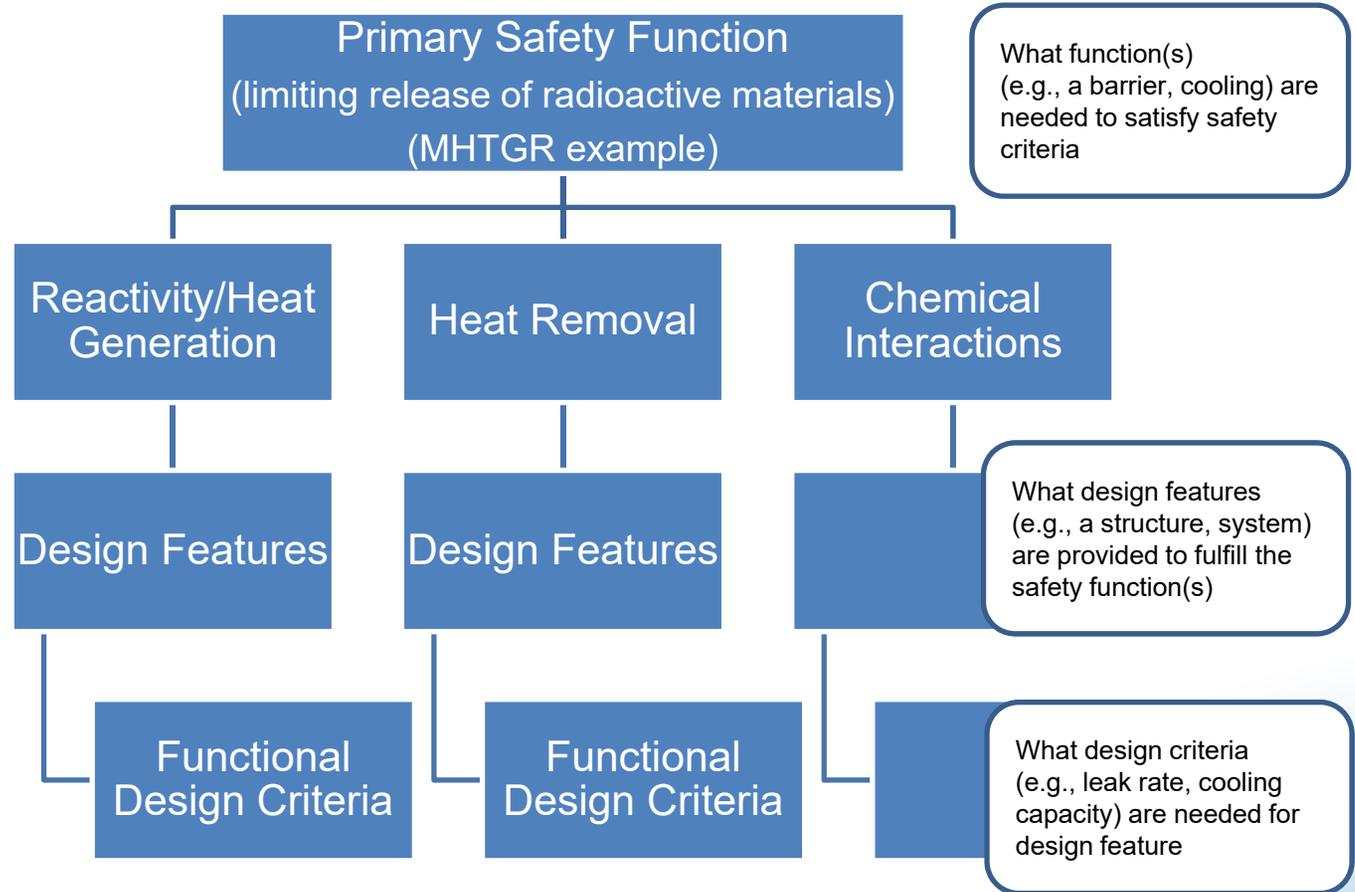
- Subpart A, General Provisions
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- Subpart J, Reporting and Administrative Requirements

Subpart C – Requirements for Design and Analysis 3rd Iteration

Subpart C – Requirements for Design and Analysis

- § 53.400, “Design Features for Licensing Basis Events”
 - Conforming changes to reflect changes to §§ 53.210 and 53.220 and to better align design features under § 53.400 to those needed to prevent or mitigate LBEs (i.e., unplanned events).
- § 53.410, “Functional Design Criteria for Design Basis Accidents”
 - Conforming changes to reflect changes to § 53.210 (Safety Criteria for Design Basis Accidents), which include relocating requirements for normal operations and emphasizing the tie to DBAs.
- § 53.420, “Functional Design Criteria for Licensing Basis Events Other than Design Basis Accidents”
 - Conforming changes to reflect changes to § 53.220 (Safety Criteria for Licensing Basis Events Other Than Design Basis Accidents), which include relocating requirements for normal operations and emphasizing the tie to LBEs such as anticipated operational occurrences, unlikely event sequences, and highly unlikely event sequences.

Technology-Inclusive Methodology



Subpart C – Requirements for Design and Analysis

- § 53.425, “Design Features and Functional Design Criteria **for Normal Operations**”
 - Addition of this section results from the removal of normal operations from §§ 53.210 and 53.220 and the movement of normal operations in Subpart B to § 53.260.
 - This section and the following presents a challenge in terms of implementing a performance-based approach that recognizes the roles of design features and programmatic controls. Staff is seeking suggestions on how an integrated framework can be best incorporated into the subparts of lifecycle stages.
- § 53.430, “Design Features and Functional Design Criteria **for Protection of Plant Workers**”
 - Conforming changes to reflect renumbering of § 53.270.

Subpart C – Requirements for Design and Analysis

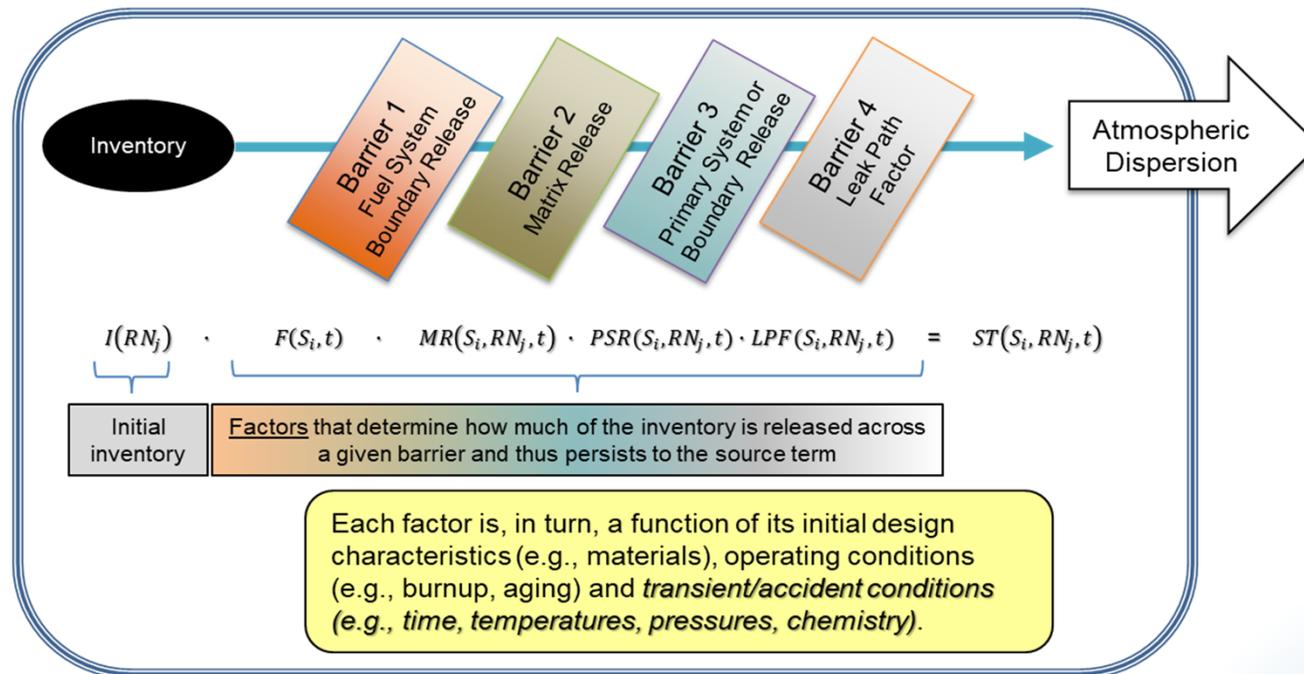
- § 53.440, “Design Requirements”
 - Conforming changes to reflect changes to §§ 53.210 and 53.220.
 - Addition of paragraph (c) results from the need for designers to evaluate and consider, in both the design and integrity assessment programs, possible degradation mechanisms such as aging, fatigue, and chemical interactions.
 - Paragraph (f) added to provide additional discussion for fire protection.
 - Paragraphs (g) & (h) add requirements for longer term capabilities to ensure reactor and waste stores can achieve and maintain subcritical conditions and cooling. (note that longer term may refer to after achieving a safe stable end state in the LBE analysis)
 - Paragraph (i) added to reinforce that the design and analyses activities under Part 53 are based on the concept of a “nuclear plant” and need to consider the number of units and radioactive sources and possible interactions between them.

Subpart C – Requirements for Design and Analysis

- § 53.450, “Analysis Requirements”
 - Paragraph (a) adds conforming changes to reflect changes to § 53.220 (Safety Criteria for Licensing Basis Events Other Than Design Basis Accidents) and removes “degradation mechanisms,” which are better addressed through the design and programmatic requirements defined elsewhere in Part 53.
 - Paragraph (e) revised to include requirements to define evaluation criteria for specific event categories and a means to identify event sequences deemed significant for controlling risks posed to public health and safety.
 - Paragraph (f) is revised to clarify the selection of DBAs.
 - Paragraph (g) updated for fire protection analysis.

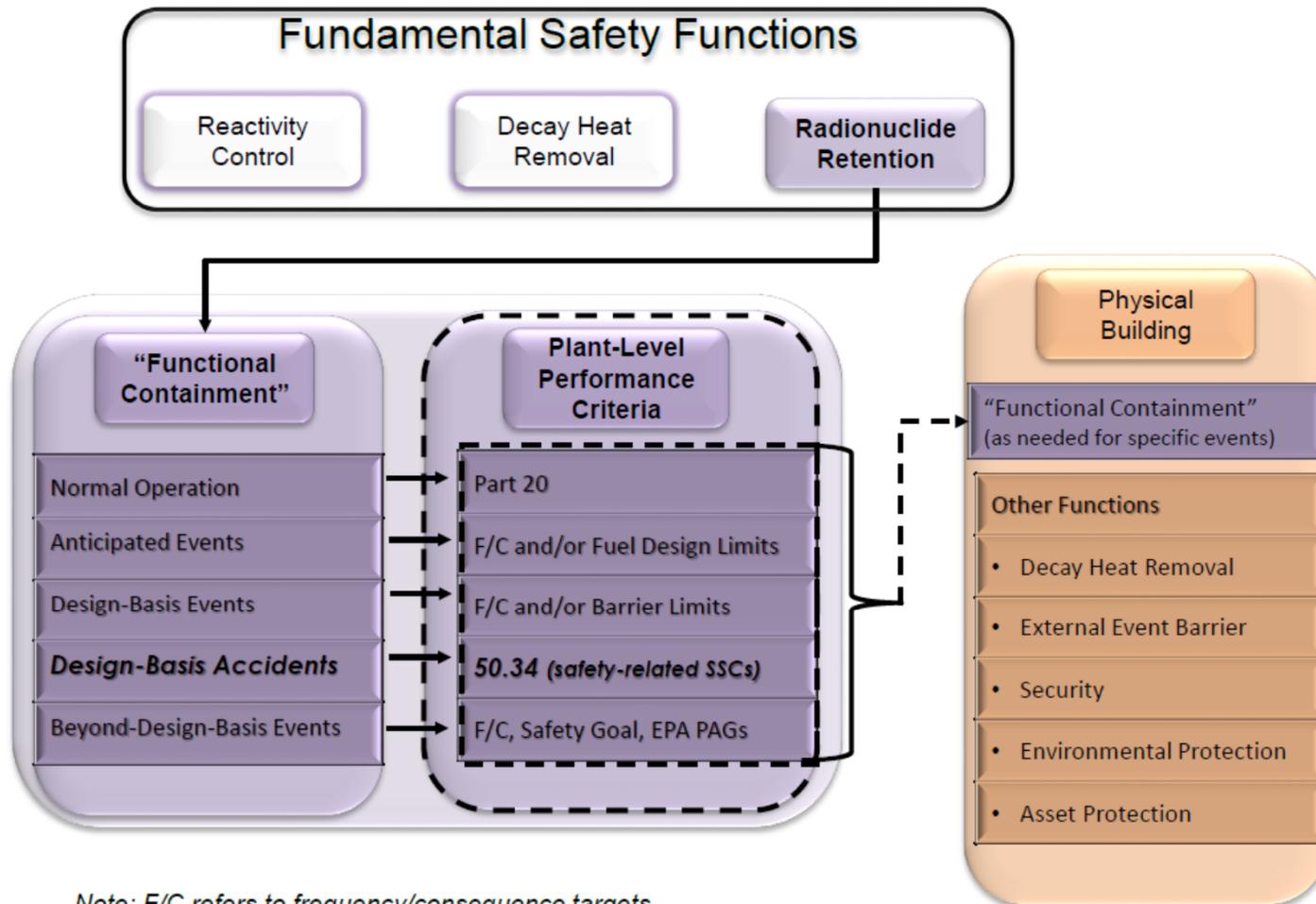
First Principles

Recent NRC activities related to advanced reactors (e.g., functional containment performance criteria, possible changes to emergency planning & security, and DG-1353) recognize the limitations of existing LWR-related guidance, which requires a return to first principles such as fundamental safety functions supporting the retention of radionuclides



See: **SECY-18-0096**, “Functional Containment Performance Criteria for Non-Light-Water-Reactors,” INL/EXT-20-58717, “Technology-Inclusive Determination of Mechanistic Source Terms for Offsite Dose-Related Assessments for Advanced Nuclear Reactor Facilities,” and **SECY-19-0117**, “Technology-Inclusive, Risk-Informed, and Performance-Based Methodology..”

Functional Containment (SECY-18-0096)



Note: F/C refers to frequency/consequence targets

Risk-significant LBEs (example)

NEI 18-04

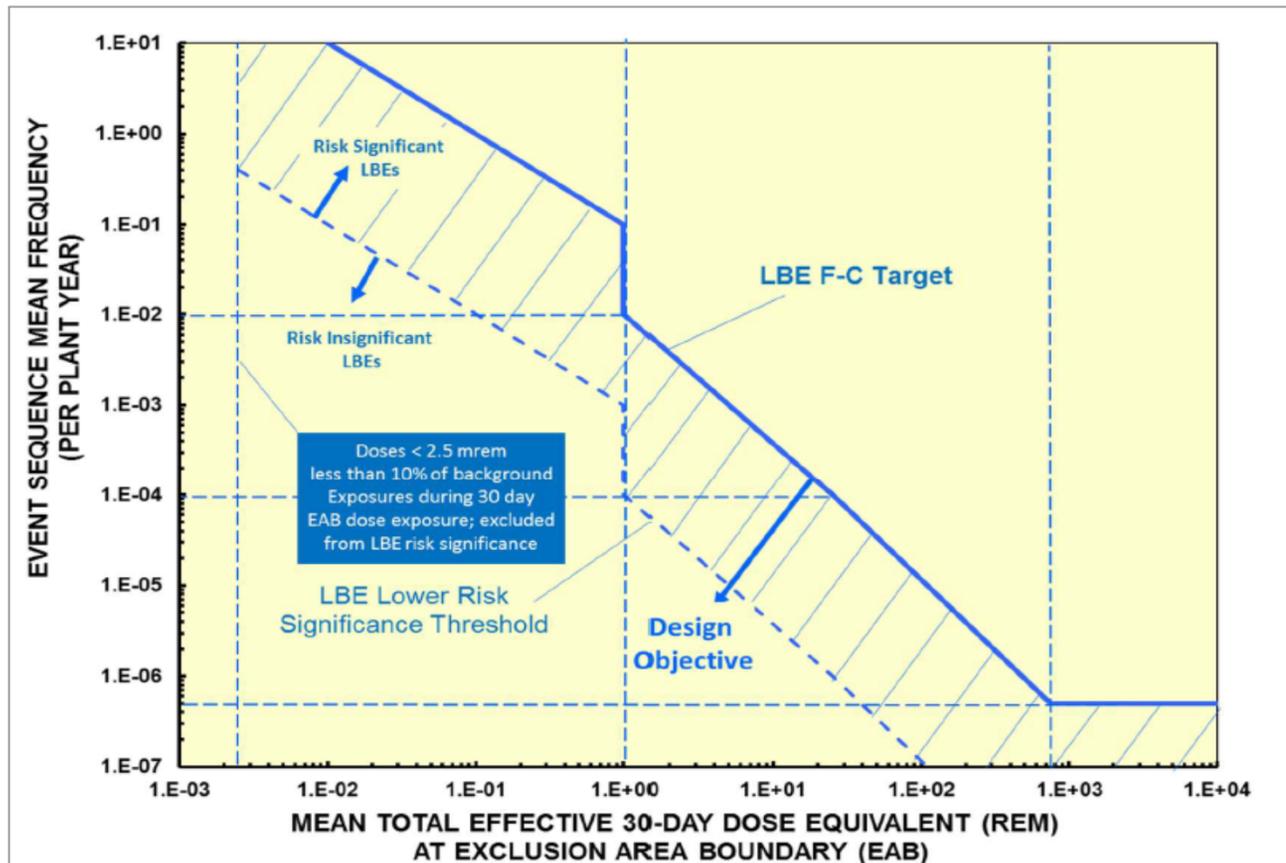


Figure 3-4. Use of the F-C Target to Define Risk-Significant LBEs

Subpart C – Requirements for Design and Analysis

- § 53.460, “Safety Categorization and Special Treatment”
 - No changes
- § 53.470, “Application of Analytical Safety Margins to Operational Flexibilities”
 - Conforming changes to reflect changes to §§ 53.210 and 53.450.
- § 53.480, “Design Control Quality Assurance”
 - No changes
- § 53.490, “Design and Analyses Interfaces”
 - No changes

Subpart C – Requirements for Design and Analysis

Discussion



MEETING BREAK

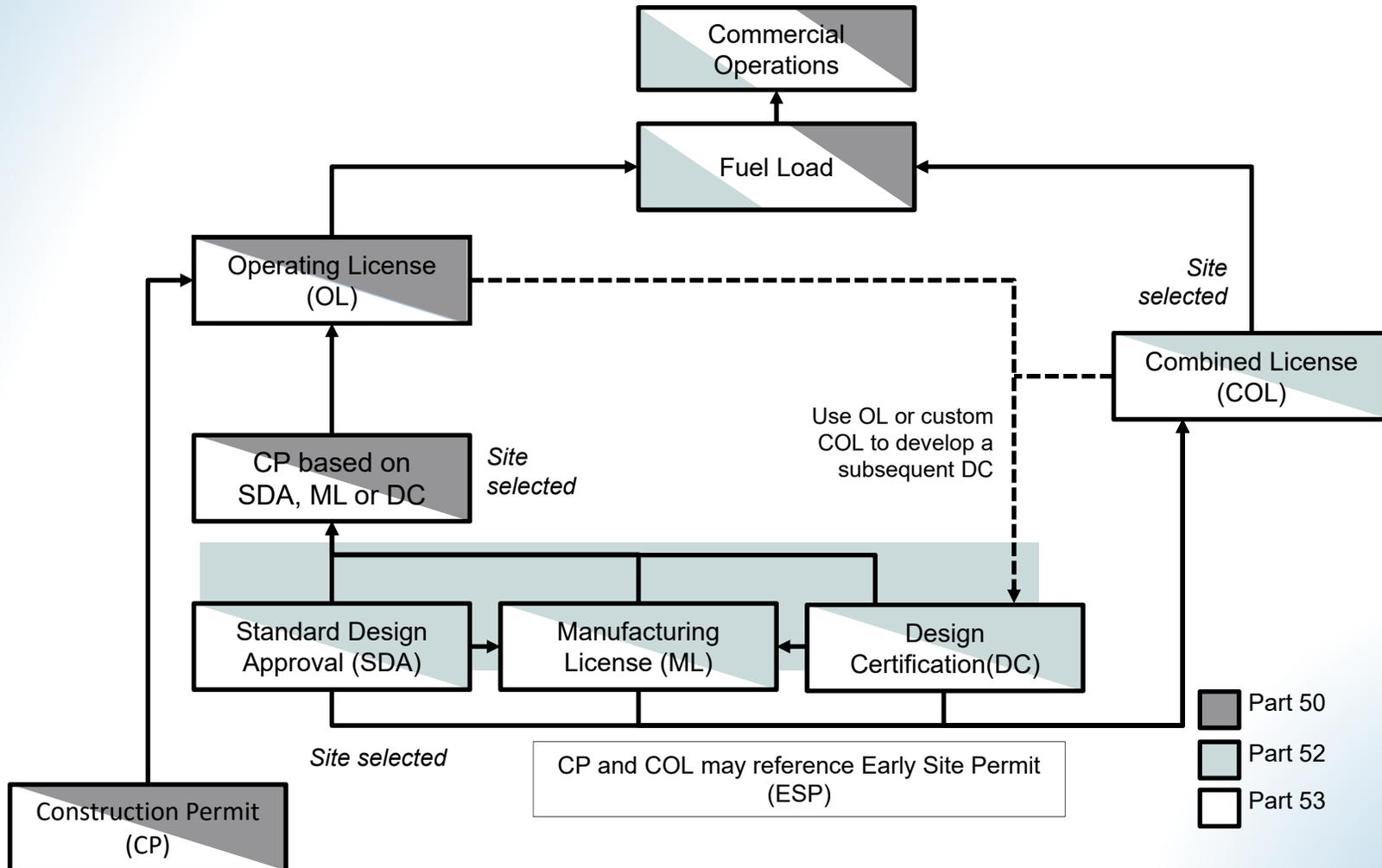
Meeting to resume in 1 hour

Part 53 General Layout

- Subpart A, General Provisions
- Subpart B, Technology-Inclusive Safety Objectives
- Subpart C, Design and Analysis
- Subpart D, Siting Requirements
- Subpart E, Construction and Manufacturing Requirements
- Subpart F, Requirements for Operation
- Subpart G, Decommissioning Requirements
- **Subpart H, Applications for Licenses, Certifications and Approvals**
- Subpart I, Maintaining and Revising Licensing Basis Information
- Subpart J, Reporting and Administrative Requirements

Subpart H – Licenses, Certifications, and Approvals Part 1: LWAs, ESPs, SDAs, DCs

Leveraging and Combining Existing Licensing Processes



Subpart H - Licenses, Certifications, and Approvals

- Several issues relate to items being addressed in the ongoing lessons learned rulemaking for Parts 50 and 52 and reconciliation will occur later.
 - The first iteration of Subpart H largely reflects the current version of Parts 50 and 52.
- Application requirements tailored to match Part 53 technical requirements. TICAP/ARCAP guidance will support Part 53.
- § 53.1100 Filing of application for licenses, certifications or approvals; oath or affirmation.
 - Provides the equivalent of § 50.30 for general administrative requirements for filing applications.
- § 53.1110 Combining applications
 - Provides the equivalent of §§ 50.31 and 52.8 and allows the combining in one application several applications for different kinds of licenses.
- § 53.1120 Elimination of repetition
 - Provides the equivalent of § 50.32 and allows applicants to incorporate by reference information contained in previous applications or reports.

Subpart H - Licenses, Certifications, and Approvals

- **§ 53.1130 Contents of applications; general information**
 - Provides the equivalent of § 50.33 for general content information applicable to all applications or a subset of applications.
 - Paragraphs on emergency plans here and throughout Subpart H will be updated following completion of the rulemaking on “Emergency Preparedness Requirements for Small Modular Reactors and Other New Technologies”
- **§ 53.1135 Environmental conditions**
 - Provides the equivalent of § 50.36(b) noting that certain licenses may include conditions to address environmental issues.
- **§ 53.1140 Agreement limiting access to Classified Information**
 - Provides the equivalent of § 50.37 requirements related to controls over Restricted Data or classified National Security Information.
- **§ 53.1150 Ineligibility of certain applicants**
 - Provides the equivalent of § 50.38 and covers restrictions related to foreign owned, controlled, or dominated applicants.
- **§ 53.1160 Public inspection of applications**
 - Provides the equivalent of § 50.39 provisions for public inspection of applications.

Subpart H - Licenses, Certifications, and Approvals

- § 53.1162 Relationship between sections
 - This is a new section that will be populated later to include text from the Part 52 sections on “Relation to other subparts,” as well as explain relationships with Part 50 licensing processes.
- § 53.1165 Site suitability reviews
 - Provides the equivalent of the Part 50, Appendix Q and Part 2, Subpart F site suitability review process.
 - Covers procedures for the filing, staff review, and referral to the ACRS of requests for early review of one or more site suitability issues relating to the construction and operation of facilities separately from and prior to the submittal of applications for CPs for the facilities (predecessor to ESPs).
 - Staff is seeking stakeholder input as to whether the process should be carried forward into Part 53.
- § 53.1170 Limited work authorizations (LWAs)
 - Provides the equivalent of § 50.10 requirements for seeking an LWA.
 - In Part 53, the definition of construction from § 50.10(a) is contained in the Subpart A definitions.

Subpart H - Licenses, Certifications, and Approvals

- §§ 53.1180-53.1199 Early site permits
 - These sections are largely copied from the existing Part 52 equivalent sections.
 - § 53.1185 Contents of applications; technical information
 - (a)(1)(ix) “An analysis of licensing basis events associated with potential designs and their results, as described in § 53.240, considered in the design to determine compliance with the safety criteria in §§ 53.210 and 53.220, or more restrictive alternative evaluation criteria elected under § 53.470 of this part. This analysis description must address the elements in §§ 53.450(e) and 53.450(f), as applicable for the licensing basis events associated with potential designs that the applicant may be considering.”
 - The phrase “licensing basis events associated with potential designs” is meant to acknowledge that the applicant may be considering one or more designs in the evaluation of its proposed site, similar to the plant parameter envelope approach that has been used by ESP applicants under Part 52.
 - (a)(1)(xi) “A description of the quality assurance program required by § 53.XX applied to site-related activities for the future design, fabrication, construction, and testing of the structures, systems, and components of a facility or facilities that may be constructed on the site.”
 - The reference to § 53.XX is to a new QA section that will be added to Subpart D, “Siting Requirements,” as the staff inadvertently failed to include such a requirement for siting activities in the first iteration of Subpart D.

Subpart H - Licenses, Certifications, and Approvals

- §§ 53.1220-53.1229 Standard design approvals
 - These sections are largely copied from the existing Part 52 equivalent sections.
 - § 53.1225 Contents of applications; technical information
 - “If the applicant seeks review of a major portion of a standard design, the application need only contain the information required by this section to the extent the requirements are applicable to the major portion of the standard design for which NRC staff approval is sought. If an applicant seeks approval of a major portion of the design, the scope of the application for which approval is sought must include all functional design criteria as can be identified at that stage of design. Such applicants must identify conditions related to interfaces with systems outside the scope of the major portion of the standard design for which NRC staff approval is sought, and functional or physical boundary conditions between the major portion of the standard design for which NRC staff approval is sought and the remainder of the standard design. These conditions must be demonstrated when the standard design approval is incorporated into a subsequent construction permit, design certification, manufacturing license, or combined license application.”
 - Additional discussion regarding SDAs for a major portion of a standard design can be found in the NRC’s “A Regulatory Review Roadmap for Non-Light Water Reactors,” and the Nuclear Innovation Alliance report “Clarifying ‘Major Portions’ of a Reactor Design in Support of a Standard Design Approval” (ML17128A507)

Subpart H - Licenses, Certifications, and Approvals

- §§ 53.1230-53.1239 Standard design certifications
 - These sections are largely copied from the existing Part 52 equivalent sections.
 - § 53.1235 Contents of applications; technical information
 - (a) FSAR (Final safety analysis report)

(1) Site Parameters	(6) Programmatic Controls and Interfaces	(11) Safety and Security	(16) Analytical Margins
(2) General Plant Description	(7) Design Features and Functional Design Criteria for the Protection of Plant Workers	(12) Probabilistic Risk Assessment	(17) Design and Analyses Quality Assurance
(3) Design Features – Licensing Basis Events	(8) Programmatic Controls for Protection of Plant Workers	(13) Analyses	(18) Design and Analyses Interfaces
(4) Design Features and Functional Design Criteria – Normal Operations	(9) Codes and Standards	(14) PRA Maintenance	(19) Design Features and Controls to Address the Minimization of Contamination
(5) Functional Design Criteria – Licensing Basis Events	(10) Materials	(15) Special Treatments	(20) Interface Requirements

- (b) Other application content

(1) Environmental Report	(3) Availability Controls (if not included in the FSAR)	(5) Inspections, Tests, Analyses, and Acceptance Criteria	(7) Safeguards Information
(2) Technical Specifications	(4) Technical Qualifications	(6) Integrity Assessment Program	

Subpart H - Licenses, Certifications, and Approvals

- § 53.1236, Review of applications, contains a new proposal for a DC applicant to reference an issued OL or custom COL with finality provisions like those for a DC applicant referencing an SDA
- Remainder of Subpart H addressing MLs, CPs, OLs, and COLs will be covered in October Subcommittee meeting

Discussion

Part 53 General Layout

- Subpart A, General Provisions
- Subpart B, Technology-Inclusive Safety Objectives
- Subpart C, Design and Analysis
- Subpart D, Siting Requirements
- Subpart E, Construction and Manufacturing Requirements
- Subpart F, Requirements for Operation
- Subpart G, Decommissioning Requirements
- Subpart H, Applications for Licenses, Certifications and Approvals
- **Subpart I, Maintaining and Revising Licensing Basis Information**
- Subpart J, Reporting and Administrative Requirements

Subpart I – Maintaining and Revising Licensing Basis Information

Subpart I – Maintaining and Revising Licensing Basis Information

- § 53.1300, “Licensing Basis Information”
- § 53.1310, “Changes to Licensing Basis Information Requiring Prior NRC Approval”
 - Introduces the requirements for proposing changes to the licensing basis information defined by licenses, orders, and regulations.
- § 53.1311, “Application for Amendment of License”
 - Provides the equivalent of § 50.90 for applications to amend an ESP, CP, OL, or COL issued under Part 53.
- § 53.1312, “Public Notices; State Consultation”
 - Provides the equivalent of § 50.91 for the NRC’s processes related to applications to amend an ESP, CP, OL, or COL issued under Part 53.
- 53.1313, “Issuance of Amendment”
 - Provides the equivalent of § 50.92 for the NRC’s processes related to applications to amend an ESP, CP, OL, or COL issued under Part 53.

Subpart I – Maintaining and Revising Licensing Basis Information

- § 53.1315, “Revising Certification Information Within a Design Certification Rule”
 - Provides the requirements for the holder of an OL or COL issued under Part 53 that references a design certification rule to propose an exemption from the specified characteristics of the certified design.
 - Other requirements related to design certification and changes to the DC by parties other than the holder of an OL or COL included in Subpart H.
- § 53.1316, “Revising Design Information Within a Manufacturing License”
 - From Subpart F of Part 52, provides the requirements for the holder of an OL or COL issued under Part 53 that references a ML to propose a departure from the specified characteristics of the manufactured reactor.

Subpart I – Maintaining and Revising Licensing Basis Information

- § 53.1317, “Amendments During Construction”
 - Provides the requirements for amending the permit or license the holder of a CP or COL issued under Part 53.
 - Paragraph (a) reflects the same requirements in § 50.35(b), while paragraph (b) reflects the process for Part 52 changes during construction.
- § 53.1320, “Evaluating Changes and Updating Licensing Basis Information Without NRC Prior Approval”
 - This section introduces the requirements for licensees to pursue changes to the licensing basis information in licensee controlled documents such as FSARs and program documents.
- § 53.1321, “Updating Final Safety Analysis Reports”
 - This section provides the equivalent of § 50.71 for the updating of FSARs.
 - Assuming a risk-informed approach in Subpart C results in PRA information being in the FSAR and therefore a separate PRA update requirement (§ 50.71(h)) is not included in this iteration of Subpart I.

Subpart I – Maintaining and Revising Licensing Basis Information

- § 53.1322, “Evaluating Changes to Facility as Described in Final Safety Analysis Reports”
 - Provides the equivalent of § 50.59 for evaluating changes to updated final safety analysis reports (UFSAR) and determining if a license amendment is required.
 - Include a risk-informed approach for assessing the results of changes on LBEs and using criteria related to the impact on margins to acceptance criteria.

§ 53.1322(a)(2)(i)

(i) Does not result in a change to the frequency or consequences of an event sequence such that an **event sequence previously deemed not risk significant** becomes risk significant by the analyses performed in accordance with § 53.450(e).

§ 53.450(e)

... The analyses must address event sequences from initiation to a defined end state and demonstrate that the functional design criteria required by § 53.420 provide sufficient barriers to the unplanned release of radionuclides to satisfy **evaluation criteria defined for licensing basis events**, to satisfy the safety criteria of § 53.220, and provide defense in depth as required by § 53.250. **The methodology used to identify, categorize, and analyze licensing basis events must include a means to identify event sequences deemed significant for controlling the risks posed to public health and safety.**

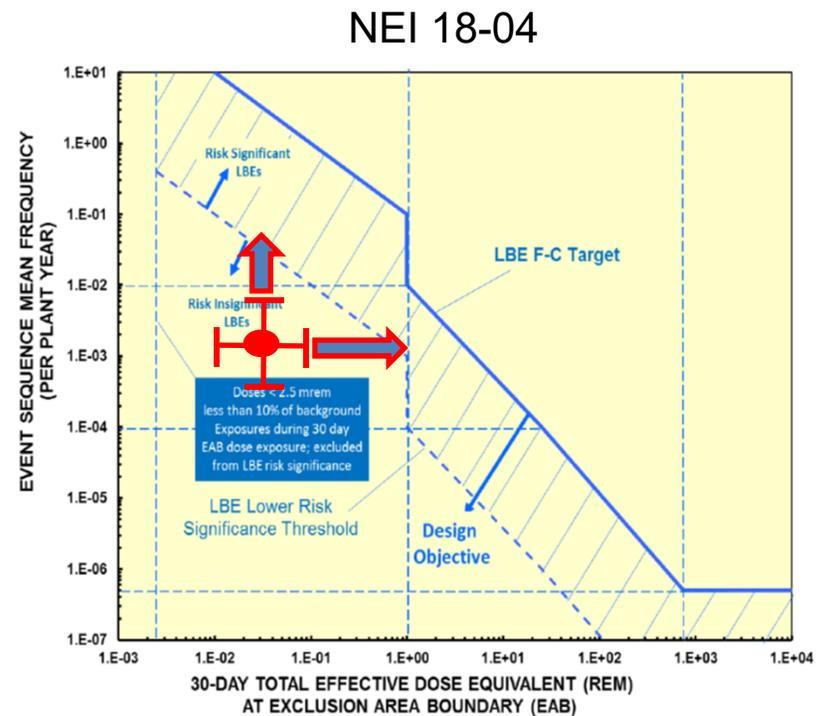


Figure 3-4. Use of the F-C Target to Define Risk-Significant LBEs

§ 53.1322(a)(2)(ii)

(ii) Does not result in a change to the frequency or consequences of an event sequence such that an **event sequence deemed risk significant** in accordance with § 53.450(e) has a decrease of 10 percent or more in the calculated margins to the LBE evaluation criteria required to be established in accordance with § 53.450(e).

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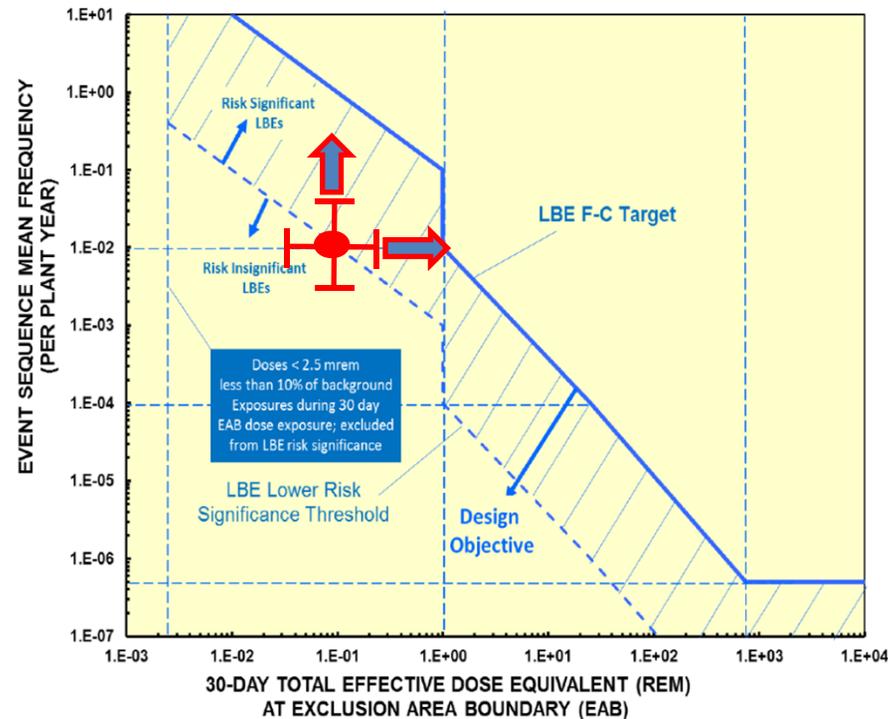


Figure 3-4. Use of the F-C Target to Define Risk-Significant LBEs

§ 53.1322(a)(2)(iii)

(iii) Does not result in a change to the frequency or consequences of one or more event sequences such that the margin between the calculated **cumulative risks** posed by the commercial nuclear plant and the safety criteria of § 53.220 decreases by 10 percent or more.

§ 53.220 Safety Criteria for Licensing Basis Events Other Than Design Basis Accidents

(b) Maintain overall cumulative plant risk from licensing basis events such that the risk to an average individual within the vicinity of the plant receiving a radiation dose with the potential for immediate health effects remains below five in 10 million years, and the risk to such an individual receiving a radiation dose with the potential to cause latent health effects remains below two in one million years.

§ 53.1322(a)(2)(iv)

(iv) Does not involve a **departure from a method of evaluation** described in the UFSAR used in assessing margins in accordance with § 53.450(e) unless the results of the analysis are conservative or essentially the same, the revised method of evaluation has been previously approved by the NRC for the intended application, or the revised method of evaluation can be used in accordance with an NRC endorsed consensus code or standard.

§ 50.59(c)(1)(viii)

(viii) Result in a departure from a method of evaluation described in the FSAR (as updated) used in establishing the design bases or in the safety analyses.

§ 53.1322(a)(2)(v)

(v) For commercial nuclear plants licensed under this part for which **alternative evaluation criteria** are applicable in accordance with § 53.470, does not result in a change to the frequency or consequences of event sequences such that the calculated margins between the results for event sequences evaluated in accordance with § 53.450(e) and the alternative evaluation criteria decreases by 25 percent or more.

§ 53.470 Application of Analytical Safety Margins to Operational Flexibilities.

Where an applicant or licensee so chooses, alternative criteria more restrictive than those defined in §§ 53.220 and 53.450(e) may be adopted to support operational flexibilities (e.g., emergency planning requirements under Subpart F of this part). In such cases, applicants and licensees must ensure that the functional design criteria of § 53.420, the analysis requirements of § 53.450(e), and identification of special treatment of SSCs and human actions under § 53.460 reflect and support the use of alternative criteria to obtain additional analytical safety margins. Licensees must ensure that measures taken to provide the analytical margins supporting operational flexibilities are incorporated into design features and programmatic controls and are maintained within programs required in other Subparts.

NEI 18-04 (w/ 1 rem goal)

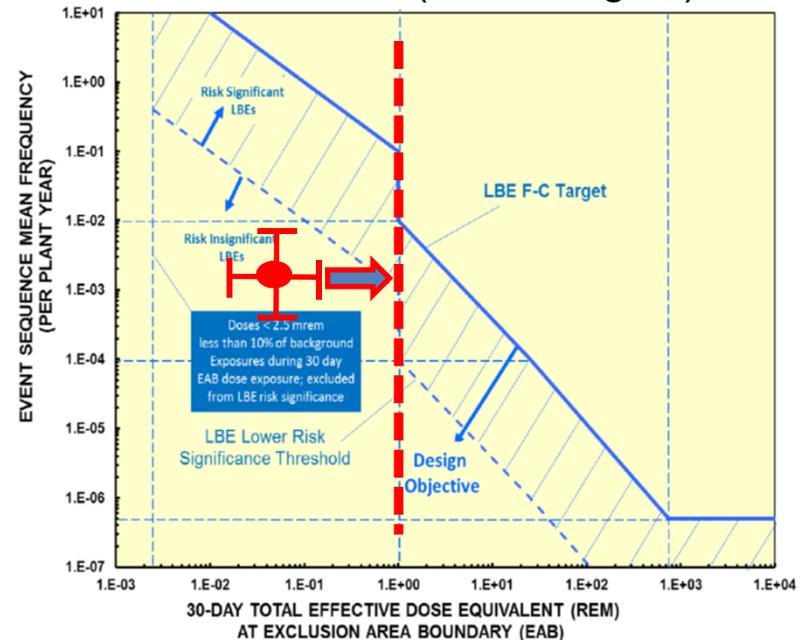


Figure 3-4. Use of the F-C Target to Define Risk-Significant LBEs

Subpart I – Maintaining and Revising Licensing Basis Information

- § 53.1330, “Control of Licensing Basis Information in Program Descriptions”
- § 53.1332, “Updating program documents included in licensing basis information”
 - Provides the equivalent of UFSAR updates for key program documents
 - This iteration provides a uniform approach for program documents, which correspond to the programs required under Subpart F. The staff is interested in stakeholder views on the benefits of a common approach versus the current practice of establishing program-specific requirements for reporting and change control.

Subpart I – Maintaining and Revising Licensing Basis Information

- § 53.1333, “Evaluating Changes to Programs Included in Licensing Basis Information”
 - Provides a uniform approach for program documents, which correspond to the programs required under Subpart F.
 - The staff is interested in stakeholder views on the benefits of a possibly developing a common approach versus the current practice of establishing program-specific requirements for reporting and change control.
- § 53.1340, “Transfer of Licenses or Permits”
 - Provides the equivalent of § 50.80 for the possible transfer of an ESP, CP, OL, or COL.
- § 53.1350, “Termination of License”
 - Provides the equivalent of § 50.82 for the possible termination of an OL or COL.

Subpart I – Maintaining and Revising Licensing Basis Information

- § 53.1360, “Information Requests”
 - Provides the equivalent of § 50.54(f) for a possible request for information that the NRC would issue to holders of an ESP, CP, OL, or COL.
- § 53.1370, “Revocation, suspension, modification of licenses, permits, and approvals for cause”
 - Provides the equivalent of § 50.100 for the possible revocation, suspension, or modification of a license or permit.
- § 53.1380, “Backfitting”
 - Provides the equivalent of § 50.109 for the possible backfitting of requirements to holders of licenses or permits.
 - First iteration may require additional measures to fully capture all of the finality provisions within Subpart H and the staff expects to update and clarify as additional sections of Subpart H are developed.
- § 53.1390, “Renewal”
 - A section may be added to more fully describe or reference the processes related to requesting and processing applications to renew ESPs, CPs, OLs, and COLs.

Subpart I – Maintaining and Revising Licensing Basis Information

Discussion



MEETING BREAK

Meeting to resume in 15 minutes

Part 53 General Layout

- Subpart A, General Provisions
- Subpart B, Technology-Inclusive Safety Objectives
- Subpart C, Design and Analysis
- Subpart D, Siting Requirements
- Subpart E, Construction and Manufacturing Requirements
- Subpart F, Requirements for Operation
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- **Subpart J, Reporting and Administrative Requirements**

Subpart J – Reporting and Other Administrative Requirements

Subpart J – Reporting and Other Administrative Requirements

- § 53.1500, “General Information”
- § 53.1510, “Unfettered Access for Inspection”
 - Requirements taken from 10 CFR 50.70 with minor changes proposed to address possible differences related to advanced reactors. Changes to address possible changes to criteria for assignment of resident inspectors and need to address possible power reactor facilities without resident inspectors.
- § 53.1520, “Maintenance of Records, Making of Reports”
 - Requirements derived from 10 CFR 50.71.
- § 53.1521, “Immediate Notification Requirements for Operating Commercial Nuclear Plants”
 - Requirements derived from 10 CFR 50.72 with minor changes proposed to address possible differences related to advanced reactors.
 - Preliminary language does not take into account a recently initiated rulemaking activity related to possible changes in immediate notification requirements.

Subpart J – Reporting and Other Administrative Requirements

- § 53.1530, “Licensee Event Report System”
 - Requirements derived from 10 CFR 50.73 with minor changes proposed to address possible differences related to advanced reactors and references to Part 53 sections.
- § 53.1535, “Facility Information and Verification”
 - Requirements taken from 10 CFR 50.78.
- § 53.1560, “Financial Requirements”
- § 53.1561, “Financial Qualifications”
 - Requirements taken from 10 CFR 50.33(f) for contents of applications.
 - Note that details on the required contents of applications to show an applicant is financially qualified for a license or permit will be in Subpart H.
- § 53.1562, “Annual Financial Reports”
 - Reporting requirement taken from 10 CFR 50.71(b).

Subpart J – Reporting and Other Administrative Requirements

- § 53.1563, “Licensee’s Change of Status; Financial Qualifications”
 - Reporting requirement taken from 10 CFR 50.76.
- § 53.1564, “Creditor Regulations”
 - Requirements taken from 10 CFR 50.81.
- § 53.1570, “Financial Protection”
- § 53.1571, “Insurance Required to Stabilize and Decontaminate Plant Following an Accident”
 - Requirements taken from 10 CFR 50.54(w).
 - Added provision for design-specific estimate
- § 53.1572, “Financial Protection Requirements”
 - Requirements taken from 10 CFR 50.57 and 10 CFR Part 140.

Subpart J – Reporting and Other Administrative Requirements

Discussion

Final Discussion and Questions



September 24th Agenda

9:30am – 9:40am

Opening Remarks

9:40am – 12:45pm

Overview of Subpart F – Requirements for Operations, Section 73.750 – General Staffing, Training, Personnel Qualifications, and Human Factors Requirements

Part 53 Rulemaking – Additional Efforts

12:45pm – 1:00pm

Discussion

Part 53 General Layout

- Subpart A, General Provisions
- Subpart B, Technology-Inclusive Safety Objectives
- Subpart C, Design and Analysis
- Subpart D, Siting Requirements
- Subpart E, Construction and Manufacturing Requirements
- **Subpart F, Requirements for Operation**
 - **General Staffing, Training, Personnel Qualifications, and Human Factors Requirements**
- Subpart G, Decommissioning Requirements
- Subpart H, Applications for Licenses, Certifications and Approvals
- Subpart I, Maintaining and Revising Licensing Basis Information
- Subpart J, Reporting and Administrative Requirements

Subpart F – General Staffing, Training, Personnel Qualifications, and Human Factors Requirements - Overview -

Subpart F – General Staffing, Training, Personnel Qualifications, and Human Factors Requirements

- The purpose of this discussion is to provide an overview of the human-system integration requirements in the proposed Part 53 rulemaking.
 - A more detailed discussion of these requirements will occur during the October 2021 ACRS subcommittee meeting.
-
- Subpart F Sections related to staffing build from concepts provided in a previously released white paper discussed with ACRS subcommittee in May 2021 (ML21069A003).
 - These requirements may fulfil roles similar to that of certain § 50.34(f) post-TMI requirements (including for human factors engineering (HFE)), portions of the § 50.54 conditions of licenses (including for operations staffing), the § 50.120 training rule, and potentially all of Part 55 for operator licensing.

Subpart F – General Staffing, Training, Personnel Qualifications, and Human Factors Requirements

- One key area addressed will be contents of applications.
- Emphasis will be placed on information needed to enable the application of flexible and scalable evaluations.
- The facility-specific operator safety role will be central.
- Specific areas anticipated to be covered include:
 - HFE design requirements that are performance-based and focused on safety and emergency response functions.
 - Certain specific human-system interface requirements.
 - The Concept of Operations.
 - Functional Requirements Analysis/Function Allocation
 - Operating Experience evaluation.
 - Staffing plan requirements that are flexible in nature.
 - Licensed operator training and examination program requirements that support tailored approaches.

Subpart F – General Staffing, Training, Personnel Qualifications, and Human Factors Requirements

- Addresses conditions for operations staffing (aspects of § 50.54).
- Emphasis on providing requirements that are consistent with determining whether a reasonable assurance of safety will exist, while also accommodating new technologies to the maximum extent practicable.
- Specific areas anticipated to be covered include:
 - Operator staffing requirements based on HFE analyses (versus prescriptive staff numbers/positions).
 - Load-following.
 - Online refueling at those facilities capable of doing so.
 - Potential for certain facilities to not require licensed operators based upon design-specific safety considerations; a key consideration would likely be the operator role in addressing LBEs.

Subpart F – General Staffing, Training, Personnel Qualifications, and Human Factors Requirements

- Requirements support technology-inclusive and flexible approaches to operator licensing examinations
- In general, this process would be comprised of:
 - Using Job Task Analyses to identify the necessary knowledge, skills, and abilities for the operator role.
 - Selecting training and evaluation methods using a systems approach to training.
 - Determining the composition of the examination, followed by piloting the proposed examination.
 - NRC review, approval, and administration.
- Elements of this approach may also be applied to those staff with important administrative responsibilities at plants that do not require any licensed operator staffing.

Subpart F – General Staffing, Training, Personnel Qualifications, and Human Factors Requirements

- **Part 53 training provisions will:**
 - Address training requirements for plant staff in general
 - Establish regulations for the training and qualifications of nuclear power plant operators, supervisors, technicians and other operating personnel.
 - Account for the potential of facilities having non-traditional personnel roles within their organizations
 - Include requirements to base training programs upon a systems approach to training
 - Continue to provide distinct requirements for licensed operator training and requalification programs

Subpart F – General Staffing, Training, Personnel Qualifications, and Human Factors Requirements

- Several areas will require the development of new regulatory guidance, including guidance for:
 - Conducting scalable HFE reviews; staff have been working with Brookhaven National Lab.
 - Reviewing staffing plans that are flexible; staff have been working to adapt the tools of NUREG-1791 to meet this need.
 - Reviewing operator licensing examinations that are tailored based on facility needs; staff have begun working with Idaho National Lab.
- Related areas of staff work include guidance for training program reviews and ARCAP guidance input.

Discussion

Part 50/53 Supplement: Technology-inclusive, Traditional, Deterministic Licensing Framework Option

Part 50/53 Supplement: Technology-inclusive, Traditional, Deterministic Licensing Framework Option

- The staff have received comments from stakeholders suggesting that PRA should not be required or play a lead role for licensing.
- As a result, the staff have begun to pursue the development of a potential deterministic licensing framework for advanced reactors.
- This framework would be technology-inclusive with PRA used in a supporting role, and leverage Parts 50 and 52 regulations while aligning with IAEA standards.

Part 50/53 Supplement: Technology-inclusive, Traditional, Deterministic Licensing Framework Option

- This traditional, deterministic option for advanced reactors would potentially include Part 50/52 elements such as:
 - Single Failure Criteria
 - Principal design criteria (PDC)
 - Design basis requirements for AOOs/DBAs
 - Traditional safety classification
 - Consideration of BDBEs and severe accidents
 - Confirmatory PRA & QHOs in guidance.

Part 50/53 Supplement: Technology-inclusive, Traditional, Deterministic Licensing Framework Option

- Including a traditional, deterministic option for advanced reactors would potentially include:
 - Leveraged flexibility by considering dose-oriented emergency preparedness/siting/security (similar to ongoing rulemakings and what is being considered in Part 53)
 - Shared Parts 50 and 53 aspects: enable flexibility in meeting codes and standards (including those related to QA requirements); addition of functional containment concept to make technology inclusive

Part 50/53 Supplement: Technology-inclusive, Traditional, Deterministic Licensing Framework Option

- Possible areas of providing alternatives to address:
 - PDCs
 - AOOs/DBAs
 - Including possible option of bounding analysis for some or all the accident analysis in a fashion similar to NUREG-1537 (maximum hypothetical accident).
 - BDBEs
 - Building upon traditional station blackout, anticipated transients without scram as well as design extension conditions from IAEA specific safety requirements
 - Severe Accidents
 - Consistent with Policy Statement, technology neutral

Part 50/53 Supplement: Technology-inclusive, Traditional, Deterministic Licensing Framework Option

- To move forward with a deterministic option, the staff are currently:
 - Engaging stakeholders, management, and the Commission on the most appropriate approach.
 - Assessing the placement of the traditional, deterministic option within the NRC's regulations.
 - Reviewing the impact of the required work to develop the framework on the NRC's schedule and resources.

Part 50/53 Supplement: Technology-inclusive, Traditional, Deterministic Licensing Framework Option

Discussion

Final Discussion and Questions



Part 53 Rulemaking Schedule

Milestone Schedule	
Major Rulemaking Activities/Milestones	Schedule
Public Outreach, ACRS Interactions and Generation of Proposed Rule Package	Present to April 2022 (7 months)
Submit Draft Proposed Rule Package to Commission	May 2022
Publish Proposed Rule and Draft Key Guidance	October 2022
Public Comment Period – 60 days	November and December 2022
Public Outreach and Generation of Final Rule Package	January 2023 to February 2024 (14 months)
Submit Draft Final Rule Package to Commission	March 2024
Office of Management and Budget and Office of the Federal Register Processing	July 2024 to September 2024
Publish Final Rule and Key Guidance	October 2024

Acronyms and Abbreviations

ACRS	Advisory Committee on Reactor Safeguards
ALARA	As low as is reasonably achievable
AOO	Anticipated operational occurrence
ARCAP	Advanced reactor content of application project
BDBE	Beyond design basis event
CFR	Code of Federal Regulations
COL	Combined license
CP	Construction permit
DBA	Design basis accident
DBE	Design basis event
DC	Design certification
DID	Defense-in-depth

EAB	Exclusion area boundary
EP	Emergency preparedness
EPA	U.S. Environmental Protection Agency
ESP	Early site permit
F-C	Frequency-consequence
FSAR	Final safety analysis report
HFE	Human factors engineering
IAEA	International Atomic Energy Agency
LB	Licensing basis
LBE	Licensing basis event
LMP	Licensing Modernization Project
LWA	Limited work authorization

Acronyms and Abbreviations

LWR	Light-water reactor
MHTGR	Modular High-Temperature Gas-Cooled Reactor
ML	Manufacturing license
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
NUREG	U.S. Nuclear Regulatory Commission technical report designation
OL	Operating license
PAG	Protective Action Guide
PDC	Principal design criteria

PRA	Probabilistic risk assessment
QA	Quality assurance
QHO	Quantitative health objective
Rem	Roentgen-equivalent man
SAR	Safety analysis report
SDA	Standard design approval
SSC	Structures, systems, and components
TICAP	Technology-inclusive content of application project
TMI	Three Mile Island
TS	Technical specifications
UFSAR	Updated final safety analysis report