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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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RELIABILITY AND PRA SUBCOMMITTEE
+ + + + +
THURSDAY, MARCH 20, 2014
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ROCKVILLE, MARYLAND
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The Subcommittee met at the Nuclear
Regulatory Commission, Two White Flint North, Room T2B1,
11545 Rockville Pike, at 8:30 a.m., John W. Stetkar,
Chairman, presiding.

COMMITTEE MEMBERS:

JOHN W. STETKAR, Chairman
RONALD G. BALLINGER, Member
DENNIS C. BLEY, Member
CHARLES H. BROWN, JR. Member
MICHAEL L. CORRADINI, Member
DANA A. POWERS, Member
JOY REMPE, Member
STEPHEN P. SCHULTZ, Member

1 DESIGNATED FEDERAL OFFICIAL:

2 JOHN LAI

3

4 ALSO PRESENT:

5 ODUNAYO AYEGBUSI, NRO

6 MARK CARUSO, NRO

7 JONATHAN L. DEGANGE, NRO

8 TODD A. HILSMEIER, NRR

9 LYNN MROWCA, NRO

10 HANH PHAN, NRO

11 SUZANNE SCHROER, NRO

12 ROBERT VETTORI, NRO

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

8:32 a.m.

CHAIRMAN STETKAR: Meeting will now come to order.

This is a meeting of the Reliability and PRA Subcommittee. I'm John Stetkar, Chairman of the Subcommittee meeting. ACRS members in attendance are Don Ballinger, Steve Schultz, Dana Powers, Dennis Bley, Charlie Brown, Joy Rempe and Mike Corradini. John Lai of the ACRS staff is the designated federal official for this meeting.

The Subcommittee will review Section 17.4 in Chapter 19 of the Standard Review Plan.

There will be a phone bridge line. To preclude interruption of the meeting the phone will be placed in a listen-in mode during the presentations and Committee discussions.

We received no written comments or requests to make oral statements from members of the public regarding today's meeting.

The Subcommittee will gather information, analyze relevant issues and facts and formulate proposed positions and actions as appropriate for deliberation by the Full Committee.

The rules for participation in today's

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1 meeting have been announced as part of the notice of this
2 meeting previously published in the *Federal Register*.

3 A transcript of the meeting is being kept
4 and will be made available as stated in the *Federal*
5 *Register* notice. Therefore, we request that
6 participants in this meeting use the microphones located
7 throughout the meeting room when addressing the
8 Subcommittee. The participants should first identify
9 themselves and speak with sufficient clarity and volume
10 so that they may be readily heard.

11 We'll now proceed with the meeting.

12 And, Lynn Mrowca, do you have something to
13 say?

14 MS. MROWCA: Thank you for having us.

15 (Laughter.)

16 CHAIRMAN STETKAR: It's great to be had.

17 MS. MROWCA: Especially since we're not
18 doing design reviews today. So this is almost like
19 vacation for us.

20 CHAIRMAN STETKAR: We'll see. So you
21 think.

22 (Laughter.)

23 CHAIRMAN STETKAR: Jonathan?

24 MR. DEGANGE: So, I'm Jonathan DeGange.
25 I'm in the Policy Group here within the Office of New

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1 Reactors, and I've been over the past few years working
2 with the staff to update NUREG-0800. A lot of these
3 updates have been really lessons learned from the most
4 recent round of large light water reactor reviews that
5 we've done over the past, you know, 5-7 years. So we're
6 here to talk to you specifically today about; I think
7 if you go to the next slide there, they're listed out,
8 17.4 with respect to, you know, reliability assurance
9 and the Chapter 19 sections.

10 So with that, I mean, we've got a lot to
11 present to you. I won't say much. We can just get
12 straight to the material.

13 CHAIRMAN STETKAR: Great. Thank you very
14 much. And by the way, for a little bit of perspective,
15 we don't normally review sections of the SRP, or at least
16 we haven't in the past. We do review regulatory guides.
17 We've seen interim staff guidance on what I'd call a
18 sporadic basis as it comes up relating to other things
19 that we review. But it was notable that several of these
20 sections were revised last year and a couple of them were
21 created newly last year. So this gives us an opportunity
22 to take a look at Chapter 19 as a whole in particular
23 and the related material in 17.4. So we thought it would
24 be a good opportunity to kind of tie things together,
25 because we honestly don't have that opportunity very

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1 often. So that's the reason why we're all here today
2 essentially.

3 And with that, I don't know who will take
4 the lead up front, so I'll just throw it to you.

5 MS. SCHROER: So, my name is Suzanne
6 Schroer and I'm the first presenter obviously this
7 morning and I'll be talking about SRP Section 17.4, which
8 is the Reliability Assurance Program.

9 So 17.4 was really updated to incorporated
10 DC/COL-ISG 18, which was sent to you back in November
11 of 2009. So it's been out in the public domain for awhile
12 and this is just our chance to finally incorporate the
13 ISG. So I won't be talking a lot about the changes that
14 were made in the ISG since it's been out for so long.
15 And I was looking through some of your past transcripts
16 and it looks like you discussed it at length in a couple
17 of meetings about, I think, APWR. So it looked like you
18 all were pretty familiar with the ISG.

19 And in addition to incorporating the ISG,
20 we also clarified the review procedures section. And
21 one thing I wanted to say also about the ISG that it only
22 provided additional guidance about the RAP. It didn't
23 change anything in it. So just for an example, in SRP
24 17.4 Rev 0 it said, "The controls for procedures
25 instructions used to implement the RAP." That was a

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1 bullet. And so we clarified that to say, "The
2 application should describe the controls for procedures
3 and instructions used for developing, coordinating and
4 implementation DRAP activities. The applicant should
5 prescribe DRAP activities by detailed procedures or
6 instructions to direct the performance of these
7 activities."

8 So that just gives you a little bit of the
9 flavor of the kinds of changes that we made. So these
10 were the areas in the SRP that were wholly replaced by
11 the information in the ISG, just to give you an idea of
12 what changed.

13 Another thing that we did in SRP 17.4 was
14 we updated the term "quality elements," which is what
15 it was in Rev 0. In SECY-95-132 it was "essential
16 elements." And now after some comments from NEI it's
17 become "implementation controls," just to really be a
18 more descriptive term. And that's used several places
19 in the SRP. So there's no real change. This is just
20 really a semantics issue.

21 I mentioned that we updated the additional
22 review procedures, and this was to include lessons
23 learned that we had during our DC and COL reviews. The
24 biggest thing we did was we added information on audits,
25 which wasn't present in the ISG or in the original rev

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1 of SRP 17.4. And then we also included some references
2 just to give the applicant a little more guidance on what
3 exactly we're talking about. For example, for the reg
4 guides, before we just said there's other regulatory
5 guidance and kind of expected the applicants to figure
6 it out. But we listed those reg guides in the SRP
7 section.

8 We issued this for public comment in October
9 of 2012. We had 42 comments and they were from NEI and
10 then Jim August, a member of the public. The NEI
11 comments were mostly minor, like saying "comprises"
12 instead of "comprised of" in some sections. So we
13 accepted most of their comments. And then Mr. August's
14 comments were mostly about plant maintenance programs
15 and not really about the SRP. And so we I don't think
16 -- well, I know we didn't. We didn't incorporate any
17 of his comments into the SRP. So that's SRP
18 17.4 and I would be glad to take your questions.

19 MEMBER BLEY: I have a question for you.

20 MS. SCHROER: Yes, absolutely.

21 MEMBER BLEY: We've looked at the DRAP a
22 bunch of times in certifications and we've always had
23 questions. I'm not sure I found the answer to our
24 questions in here. The DRAPs before fuel load and then
25 afterwards you have the RAP continuing in the operations

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1 phase --

2 MS. SCHROER: Yes.

3 MEMBER BLEY: -- but some of the items there
4 are driven by risk concerns and you don't have a real
5 PRA until fuel load. I don't see anything that forces
6 people to back and make sure that DRAP is expanded in
7 any ways that would become necessary from results of the
8 full-scope PRA. Is there something that I missed?

9 MS. SCHROER: So one thing; and I don't know
10 if you remember, and I barely remember, way back when
11 the Reliability Assurance Program first started is we
12 wanted to have what was called an ORAP. That's what we
13 proposed. And so that got rejected. The Commission
14 said, no, we're not doing an ORAP, but the controls of
15 the RAP Program, the DRAP list will go into other
16 programs that the licensee already has. We don't need
17 a new program.

18 And so, they won't be required to update the
19 DRAP list once they're operational, but they will be
20 required to take those SSCs that were in the DRAP list.
21 And initially they have to go under the Maintenance Rule,
22 and that's reflected in the new SRP section. And then
23 as operation continues, where it goes depends on the
24 reliability of the components.

25 MEMBER BLEY: Well, that's do you keep the

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1 things you already had? But nothing says when you really
2 know more about the risk from the plant, should that list
3 have been expanded? The things that go under the
4 Maintenance Rule, should they have been expanded from,
5 you know, what comes out of the full PRA? And maybe that
6 shows up somewhere else in the regulations, and I'm not
7 quite sure where.

8 MS. MROWCA: Well, I think that would be
9 like the Maintenance Rule, for instance, that --

10 MEMBER BLEY: Would that drive you to go
11 back and look again once you had the updated PRA, the
12 full-scope PRA?

13 MR. CARUSO: Well, can I --

14 MS. MROWCA: Go ahead.

15 MR. CARUSO: Yes, and I think, you know,
16 there are requirements and procedures and, I think, reg
17 guides and stuff on how you scope stuff in the
18 Maintenance Rule. And so, and there are also
19 requirements for upgrading and updating your PRA. And
20 although it's not required, I think pretty much all the
21 utilities, you know, use their PRA to capture the
22 risk-informed piece of scoping stuff in, or ranking
23 stuff for Maintenance Rule.

24 So I don't think there's a specific
25 requirement that says, you know, every three years you

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1 should go back and rethink the RAP list.

2 MEMBER BLEY: That's not every three years.
3 I mean, there's a big difference between a PRA done for
4 a plant that's half defined, which was the case for some
5 of the design certs --

6 MR. CARUSO: Well, I thought we were
7 talking about after.

8 MEMBER BLEY: I am.

9 MR. CARUSO: But there's --

10 MEMBER BLEY: After the PRA, before fuel
11 load is supposed to be complete and plant-specific.
12 That's the first time it gets complete and
13 plant-specific, which is --

14 MR. CARUSO: I got lost. I thought we were
15 talking about after fuel load is there a way to assure
16 that if other components become risk-significant they
17 get captured.

18 MEMBER BLEY: You did get lost.

19 MR. CARUSO: And I think between the
20 requirements for scoping things under the Maintenance
21 Rule and requirements for updating your PRA you probably
22 get that, but there's nothing in black and white that
23 says, you know, you need to do that. But seems to me
24 you update your PRA with data and stuff and you find that
25 something is more risk-significant. Then you've got

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1 your Maintenance Rule that tells you you better go back
2 and think about how you treat that in the Maintenance
3 Rule.

4 MR. HILSMEIER: I think I can provide -- my
5 name is Todd Hilsmeier, NRR, used to be NRO, and I worked
6 with Suzanne on developing the SRP 17.4.

7 And on Suzanne's slide No. 4 where she
8 talked about the quality elements and that name was
9 changed to essential elements. Now it's programmatic
10 controls. But basically those implementation controls
11 under that, it provides requirements that the applicant
12 must update the RAP list as the PRA is updated and
13 modified and changed. So basically the implementation
14 controls are processes and controls that ensure the
15 risks insights, key assumptions, the list of
16 risk-significant SSCs are consistent with the design
17 constructive plant. And so when the applicant
18 describes their programmatic controls they also need to
19 describe how they're going to update the living RAP list
20 as the PRA is updated, as the design is changed. So that
21 should capture changes to the RAP list as the PRA is
22 updated. I hope that answers your question.

23 MEMBER BLEY: I hope it works that way.
24 Yes, thank you.

25 CHAIRMAN STETKAR: I had a

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1 peripherally-related question. I'm just I can tie it
2 in somehow.

3 (Laughter.)

4 CHAIRMAN STETKAR: Section 17.4 and the
5 whole notion of the -- well, let me just say, several
6 sections in 17.4 note that the application needs to
7 identify dominant failure modes and that the -- there
8 were statements that say, for example, dominant failure
9 mode should be used, or could be used; sorry, to
10 facilitate the identification of specific reliability
11 assurance activities or strategies. For example,
12 in-service inspections, in-service testing,
13 surveillance testing, monitoring and maintenance.

14 So there seems to be this emphasis on
15 dominant failure modes. First of all, how do you
16 identify what failure mode is dominant compared to which
17 failure mode is not dominant? What determines
18 dominance?

19 MS. SCHROER: Well, I think that would come
20 from the PRA.

21 CHAIRMAN STETKAR: Well, that's why I'm
22 asking.

23 MS. SCHROER: So just -- and this is, in my
24 mind of course, I think on some of these things were
25 intentionally vague so that the applicant --

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1 CHAIRMAN STETKAR: Well, it's not time to
2 be intentionally vague. That's my point.

3 MS. SCHROER: But for example, if you look
4 at the risk insights, there are some components where
5 the failure to start makes the component
6 risk-significant, that, you know, basic event from the
7 PRA. But then the failure to run doesn't meet that --

8 CHAIRMAN STETKAR: Or perhaps --

9 MS. SCHROER: -- threshold.

10 CHAIRMAN STETKAR: -- as we've seen in many
11 of the design certification PRAs, they've not looked at
12 all of the failure modes. They have actually omitted
13 some that we indeed have found to be important. So how
14 can you determine what is dominant when your PRA doesn't
15 even include all of the failure modes?

16 MS. SCHROER: Well, I think that's the
17 reason you have the expert panel and not just looking
18 at the PRA results.

19 CHAIRMAN STETKAR: How does the expert
20 panel determine what a dominant failure mode is? I've
21 been doing PRA for 35 years. I don't know what a dominant
22 failure mode is. That's why I'd like the staff to
23 explain to me what a dominant failure mode is.

24 MR. HILSMEIER: This is Todd Hilsmeier
25 again from -- I don't need to keep --

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1 CHAIRMAN STETKAR: No, you don't. Just
2 your name so that we have you on the record, Todd.

3 MR. HILSMIEIER: Okay. This issue about
4 dominant failure modes came up through SECY-95-132,
5 which is the basis document for RAP.

6 CHAIRMAN STETKAR: That would be something
7 that was published in 1995, 19 years ago?

8 MR. HILSMIEIER: Right.

9 CHAIRMAN STETKAR: Okay. Thank you.

10 MR. HILSMIEIER: Yes, and it is the sole
11 basis for RAP. It was also developed in parallel with
12 the Maintenance Rule. And in that guidance document
13 there's no specific guidance on how to identify dominant
14 failure modes. Applicants tend to interpret dominant
15 failure modes as those failure modes which contribute
16 significantly to risk. Like for example, as Suzanne was
17 saying, let's say a motor-operated valve, it's
18 risk-significant because it needs to open to allow
19 injection. And so that dominant failure mode would be
20 -- a risk-significant failure mode would be fail to open
21 versus fail to close.

22 Now a lot of those can be identified through
23 the PRA risk-important measures. Also I believe
24 SECY-95-132 also says that the expert panel needs to
25 consider industry operating experience in identifying

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1 these dominant failure modes. And the SRP 17.4 doesn't
2 go into detail about how to define dominant failure modes
3 because it is not -- SRP 17.4 is guidance to the staff
4 on how to review the RAP Program description and not how
5 to develop it.

6 Now Jim August, I don't know if you remember
7 him or not, he actually as a public member several years
8 ago after an ACRS meeting on RAP for one of the COLs,
9 he gave a presentation and he raised a lot of issues.
10 Like one issue was that standardized maintenance at the
11 power plants is very important. And he also raised
12 issues about dominant failure modes, how they're
13 determined. And so right now there's a ANS Working
14 Group, which NRC is involved on, to develop an ANS
15 Standard address -- to develop detailed guidance on
16 development of a RAP that would meet SRP 17.4 in addition
17 to address his issues about standardized plant
18 maintenance. And that ANS Standard would also address
19 in detail the details about dominant failure modes.

20 But right now one of the design centers
21 -- design certifications, they went and defined dominant
22 failure modes for all their RAP SSCs. Generally, we
23 require that during the COL application phase. And the
24 reason why the dominant failure modes are important is
25 because it's important to make sure that the maintenance

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1 and test programs address those dominant failure modes,
2 that those dominant failure modes are not ignored.

3 CHAIRMAN STETKAR: Okay.

4 MR. HILSMEIER: Like if a valve needs to
5 open, the testing needs to ensure that that valve can
6 open.

7 CHAIRMAN STETKAR: Thanks. We are going to
8 run short on time here. The concern I have is that I
9 can run a PRA model and develop six significant figure
10 numbers for risk achievement worth or Fussell-Vesely
11 importance for all that silliness. And I can have some
12 things on top of the pile and I can have some things in
13 the middle of the pile and I can have some things on the
14 bottom of the pile. And if I'm not careful, I can have
15 some things that ought to have been in the pile, but I
16 just didn't put them in my model for whatever reason.
17 They have to be there, but I didn't put them in my model.
18 If people are organizing detailed testing and
19 maintenance programs around dominant failure modes, in
20 principle that says to me that for a particular
21 motor-operated valve I only look at the open limit
22 switches because, my God, the open limit switches are
23 the only limit switches that contribute to this dominant
24 failure mode for that motor-operated valve for this
25 particular model and this particular version of this

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1 particular PRA that was developed under these particular
2 assumptions.

3 I don't look at the closed-limit switches
4 for that valve? Why don't I look at the closed-limit
5 switches for that valve? Why are they, you know, out
6 of the scope of my testing and maintenance program
7 because they're not dominant? Of if they're a factor
8 of two lower than my dominant, do I not look at them
9 because they're only half as important as my dominant
10 failure mode? See my problem? Why don't I just look
11 at the valve?

12 MR. HILSMEIER: They do.

13 CHAIRMAN STETKAR: Because I can identify
14 a valve -- if the design certification doesn't include
15 that valve and it performs a safety function, that's a
16 pretty significant omission from the design
17 certification PRA. If it misses a couple of failure
18 modes, maybe that's because they only did a quality, you
19 know, capability category 1 PRA, which they're allowed
20 to do, which says, yes, sort of the valve is in there
21 and it has to kind of work. See my whole point is if
22 in the guidance we are suddenly focusing on such minutiae
23 that we may avoid having people look at the component
24 as a whole, maybe it's important for some places for that
25 pump to trip. But, gee, the PRA doesn't model tripping

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1 of the pump because it assumes that, well, the pump will
2 trip if it has to trip and if it doesn't trip, we won't
3 worry about that.

4 MS. SCHROER: I think one thing that I would
5 like to clarify though is that the SRP 17.4 just says
6 there needs to be consideration of these dominant
7 failure modes. It doesn't say only look at the dominant
8 failure modes and ignore any --

9 CHAIRMAN STETKAR: No, I'm sorry. Let me
10 quote things here: "Prior to initial fuel load the COL
11 licensee identifies dominant failure modes and
12 integrates RAP into operational programs. The
13 application should propose an acceptable process for
14 determining dominant failure modes of RAP SSCs." These
15 are should identifies. This is instructions to your
16 reviewers, but it's instructions to the licensee for
17 what you expect. You expect dominant failure modes.
18 You don't expect a holistic treatment of the equipment.

19 I have many other quotes. That term
20 dominant failure modes, you should identify. We
21 expect. You know, those expectations are throughout
22 this guidance.

23 MEMBER BLEY: That's true, but just an
24 aside on language. Whoever on the staff wrote Reg Guide
25 1.200 explicitly tried to get rid of the use of

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1 "dominant" because it was so ill-defined. And it's
2 historic. You know, when Wash 1400 was done, there were
3 a couple of dominant failure modes for almost every
4 sequence. And we fixed a lot of those. So now
5 everything contributes a little. So they shifted to
6 significant in terms of risk, you know, and that you can
7 define precisely, if you so desire. But it's a term
8 whose usage should have disappeared. And the staff has
9 tried to make it disappear. I'm not sure why it's coming
10 back.

11 CHAIRMAN STETKAR: I wanted to raise the
12 issue of dominance since Dennis just brought it up. I'm
13 really more concerned about -- especially at the level
14 of design certification PRA where they are -- let's just
15 say we've seen a lot of variability and an awful lot of
16 simplifications in those models. And to infer that
17 someone will identify specific failure modes for
18 specific components; particular valve fails to open,
19 particular pump fails to start, and have those failure
20 modes then become the basis for the final Reliability
21 Assurance Program and the equipment and particular
22 testing and maintenance activities that are applied
23 during plant operations is a bit of a concern.

24 Because I can see identifying equipment; a
25 pump or the valve certainly at the level of the design

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1 certification, perhaps after you have some operating
2 experience with the plant operational and have more
3 refinements in the PRA and more sense of completeness
4 in terms of the entire PRA model so that you can actually
5 model the relative risk significance of particular
6 failure modes for overall risk that includes all of the
7 things that are not modeled at all. Low-power shutdown,
8 simplistic treatment of fires no PRA treatment of
9 seismic events, essentially no treatment of external
10 flooding, cursory treatment of high winds. How do you
11 know how important that fail-to-open failure mode for
12 that one particular valve is to overall plant risk
13 without having that overall risk model?

14 MR. HILSMEIER: John, what part of the SRP
15 were you reading? Forty?

16 CHAIRMAN STETKAR: Well, it starts in
17 Section I.

18 MR. HILSMEIER: Okay.

19 CHAIRMAN STETKAR: Areas for Review. And
20 it goes throughout Section II, in different subsections
21 of Section II --

22 MR. HILSMEIER: Right.

23 CHAIRMAN STETKAR: -- which are the
24 acceptance criteria. So I've got Section I there's a
25 statement, Section II-A.6, Section II-A.9, II-B.3,

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1 II-B.3. And I probably got tired of listing them.

2 MR. HILSMEIER: I'm looking at acceptance
3 criteria B3.4 where it says, "Consideration of dominant
4 failure modes. The RAP SSCs which are determined in
5 accordance with the process established under the
6 referenced DC."

7 MS. SCHROER: I was looking at the same
8 spot, Todd. And so I think when you talk about what the
9 applicant should do, we say, yes, you should have a
10 process for determining these dominant failure modes,
11 but then when you talk about integrating it; and that's
12 in Section B3, into the operational programs, it's not
13 a should or a shall, it's a consider it.

14 MR. HILSMEIER: Right.

15 CHAIRMAN STETKAR: Well, except for the
16 fact the example in that section is the one that I quoted.
17 It says, "For example, dominant failure modes" and I'm
18 not going to go -- "could be used to facilitate
19 identification of specific reliability assurance
20 strategies, in-service inspection."

21 My point is that if the NRC staff focuses
22 on dominant failure modes; whatever dominant means, but
23 focuses on failure modes, the industry will say, well,
24 we are following the NRC's staff's guidance and here are
25 the failure modes for which we will do the testing. We

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1 will organize our testing and maintenance programs
2 around these failure modes because they are the most
3 important failure modes. Let's do away with this notion
4 of dominant. And they're following NRC guidance, the
5 NRC staff reviewers, where we look at those failure
6 modes, because they're only pointed to those important
7 failure modes.

8 MR. HILSMEIER: I think the word
9 "facilitate" I interpret as dominant failure modes can
10 be used to help to identify. But there's other methods,
11 too.

12 CHAIRMAN STETKAR: Okay. We've probably
13 belabored this enough, but I think you get my point that,
14 I personally anyway, just think especially at the design
15 certification stage the emphasis on both -- the emphasis
16 to the applicant to identify important failure modes,
17 any emphasis to the staff reviewer is to focus on failure
18 modes rather than equipment may not be very well-suited.
19 It may be better to focus simply on identifying the most
20 risk-important components and organizing your testing
21 and maintenance activities around those components,
22 certainly at the design certification stage up through
23 -- and probably up through loading of fuel. As Dennis
24 mentioned, you really don't have a complete PRA until
25 that time.

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1 MS. SCHROER: Thanks for the comment.

2 MR. HILSMEIER: And one last point is like
3 the Maintenance Rule and the Quality Assurance Program
4 addresses the whole component --

5 CHAIRMAN STETKAR: Yes.

6 MR. HILSMEIER: -- of reliability.

7 CHAIRMAN STETKAR: Yes, so why are we
8 not --

9 MR. HILSMEIER: The only reason, when I was
10 writing this up I really didn't want to address dominant
11 failure modes because it's in the SECY-95-132.

12 CHAIRMAN STETKAR: Well, also part of
13 -- you're going to hear later another one of my rants
14 is that a lot of these SECYs that are referenced in the
15 ISGs and now in these versions of the SRP were developed
16 during the early to mid-'90s, in some cases the late
17 '80s, very late '80s, when the staff and the Commission
18 were struggling with this notion of the next generation
19 of plants to be licensed in the United States. The first
20 ones off the block, at least in the passive plant
21 designs, was the AP600. So I think everybody was
22 focusing on that particular issue when these things were
23 developed.

24 We're now sitting in a world where we have
25 large passive plant designs. We have large active plant

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1 designs. We have small modular reactors that are mostly
2 or largely passive with some active components.

3 MEMBER POWERS: We have no idea what's in
4 small modular reactors. It changes by week.

5 CHAIRMAN STETKAR: Yes, I was trying to be
6 as vague as possible.

7 (Laughter.)

8 CHAIRMAN STETKAR: I've heard that some of
9 them are more passive/aggressive than others.

10 (Laughter.)

11 CHAIRMAN STETKAR: So the point is that if
12 we're issuing the SRP now going forward; and the SRP
13 doesn't get changed all that frequently, we ought to keep
14 a lot of these things in mind. There is historical
15 context from SECYs and SRMs, but the context under which
16 those were issued and developed compared to what we
17 understand now and what sort of guidance we want to give
18 to our reviewers, but also through the SRP to the
19 industry, going forward so that people who come in with
20 small modular reactor designs or the next large light
21 water reactor new design, if there is one, have that as
22 a basis. So anyway --

23 MS. SCHROER: Thank you.

24 CHAIRMAN STETKAR: Anything else on
25 17.4? (No audible response.)

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1 CHAIRMAN STETKAR: Thank you.

2 MR. CARUSO: Okay. I guess we're ready to
3 talk about Section 19.0. 19.0 is the SRP for
4 Probabilistic Risk Assessment and Severe Accident
5 Evaluation for New Reactors. I'm MARK Caruso.

6 The big picture here is that this update was
7 to cover incorporating a number of ISGs that included
8 interim guidance over the past several years that was
9 developed and also try and factor in the review
10 experience from our reviews of the ESBWR, the AP1000 and
11 the EPR and the APWR.

12 ISG-03 was developed I think starting
13 probably around 2007. We had already updated the SRP
14 in 2007. And as we started to do the reviews, we started
15 to find that the reviewers had some questions about what
16 things meant and the industry was indicating that they
17 were confused about some things. So we had a number of
18 public meetings and it became clear that we need to
19 clarify some things to make the reviews, you know, better
20 for both parties.

21 So we did that. I'm not going to go into
22 all that -- you know, some of the areas included the
23 treatment of external events. That would be done.
24 There were issues about PRA maintenance upgrade. When
25 do you need to report changes and what's a significant

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1 change in the PRA? What do I have to give you? These
2 were open questions and people wanted answers. And so
3 that was the genesis for ISG-03. So all of the
4 information that's in ISG-03 has been just been brought
5 into SRP 19.0.

6 ISG-20 is guidance on PRA-based seismic
7 margins analysis. The original SRP 19.0 really didn't
8 talk at all about it. I mean, basically there was the
9 Commission saying you could do a seismic margins
10 analysis. The DCs could do it because if you don't a
11 site you can't really do a seismic PRA. But there were
12 a lot of questions about, you know, how to do that. And
13 so the engineering folks and the PRA Branch, mostly the
14 engineering folks, put together this guidance for
15 PRA-based seismic margins analysis. It also covered
16 DCs. It also covered if you did it as a COL, which the
17 COLs are going to have to do seismic PRAs. And it also
18 covered post-COL. So there's a lot of guidance in there.

19 ISG-03 is going to be --

20 CHAIRMAN STETKAR: I'm sorry, MARK. You
21 said COLs will all have seismic PRAs. They will not.
22 They have seismic margins analysis.

23 MR. CARUSO: Well --

24 CHAIRMAN STETKAR: Fuel load still have
25 holders about seismic PRAs.

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1 MR. CARUSO: Yes, I know. Holders.

2 CHAIRMAN STETKAR: Okay.

3 MR. CARUSO: You are correct.

4 CHAIRMAN STETKAR: Thank you.

5 MR. CARUSO: Yes, COL stage they still have
6 the margins analysis.

7 CHAIRMAN STETKAR: Right.

8 MR. CARUSO: And when they become holders,
9 they'll eventually --

10 CHAIRMAN STETKAR: Right.

11 MR. CARUSO: And there's guidance in for
12 post-COLs in there. So since this SRP 19.0 is really
13 for DCs and COLs, we're not going to sunset ISG-20
14 because there's guidance in there that needs to stay
15 there.

16 Digital I&C-ISG-03 is about looking at PRA
17 for digital I&C systems. And I believe the genesis of
18 this was that it got started before the rule change that
19 said you don't need to submit your PRA anymore, because
20 this guidance is really about trying to look at PRA for
21 digital I&C systems. And, you know, when we review the
22 applications, we're not reviewing the PRAs. We're
23 reviewing the description of the PRA and its results.
24 And that's what the rule change was about, that you don't
25 need to submit the PRA.

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1 So this is quite detailed guidance. Well,
2 it's at a high level. I guess the point is is that the
3 kinds of thing that this ISG expects you to be able to
4 see and look at and review are not going to show up.
5 They're not going to show in a DC application or a COL
6 application.

7 MEMBER BLEY: You'd have to do an audit to
8 see that.

9 MR. CARUSO: Exactly.

10 MEMBER BLEY: But I tell you what, the stuff
11 on I&C PRA is -- on the one hand it says look for all
12 these wonderful things. And every time it says that,
13 it says, yes, but nobody knows how to do that.

14 MR. CARUSO: Yes.

15 MEMBER BLEY: So it's pretty confusing
16 guidance for somebody who's trying to use it.

17 MR. CARUSO: Yes, I would agree with that.
18 But we have it out there and it does have a lot of useful
19 stuff in it to help. And we felt, as you said, that the
20 place for this is if you're going to do an audit, that
21 it might be helpful there. So we've included it as a
22 section of guidance to use if you're going to do an audit
23 and you're really going to focus in on that system.

24 So let me --

25 MEMBER BROWN: I --

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1 MR. CARUSO: Excuse me?

2 MEMBER BROWN: Should I wait or should I say
3 something now?

4 CHAIRMAN STETKAR: Why don't you wait? He
5 has another more -- he'll eventually get to slide,
6 because --

7 MEMBER BROWN: That's what I -- okay. I
8 didn't want to interrupt --

9 CHAIRMAN STETKAR: -- he has that as a line
10 item.

11 MEMBER BROWN: -- or break in too early, but
12 I do have --

13 MR. CARUSO: I can hardly wait for what's
14 coming.

15 (Laughter.)

16 MEMBER BROWN: Now that you've gotten over
17 the shock of having me be here, number one --

18 (Laughter.)

19 MEMBER BROWN: -- I just wanted to make sure
20 knew I did come here with a specific purpose in mind.

21 MR. CARUSO: We'll wait patiently.

22 MEMBER BROWN: Now you can think about
23 that.

24 (Laughter.)

25 MR. CARUSO: You're here. Now I know.

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1 MEMBER BROWN: This is easy. All right.
2 Thanks.

3 MR. CARUSO: So, I don't want to talk about
4 the ISGs anymore. Let's talk about the incorporation
5 of experience from the reviews.

6 So one of the things we identified is
7 another interface that the PRA Branch has in performing
8 its review. In the Structural Engineering area we
9 interact with the engineering folks on the seismic
10 margins analysis. We also interact heavily -- in fact,
11 they do a lot of the review of the containment
12 performance analysis for beyond-design-basis
13 accidents.

14 Human Factors Engineering. We interact
15 with them over identification of significant human
16 actions, risk-significant human actions.

17 We interact with the folks in the Division
18 of Site Safety and Environmental Analysis that do the
19 external hazards review in Chapter 2 of the FSAR for our
20 reviews of external events. There's coupling there.

21 In the Digital I&C area, we frequently
22 consult with the Digital I&C folks. As you know, there
23 was a meeting some time ago where we discussed some
24 statements in some of the Chapter 7 SRPs that had to do
25 with PRA. So there's an example of where we need to

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1 interact with them.

2 And then the folks that look at the
3 regulatory treatment of non-safety systems, the PRA
4 staff does the part that looks at the focused PRA
5 studies, which are basically sensitivity studies that
6 look at the importance of non-safety systems.

7 Give me the next slide.

8 CHAIRMAN STETKAR: MARK, before you -- and
9 I did look ahead and you don't have a slide on this, so
10 I'll interject now.

11 Well, I got confused, and help me out on this
12 one. When I read the DC -- this is seismic margin
13 analysis to get you thinking in that area. When I read
14 the SRP in DC COL ISG-20 on PRA-based seismic margins
15 analysis, I understand what is expected during the
16 design certification and the COL application phase in
17 terms of the scope and the type of seismic margin
18 analysis that the staff expects.

19 What I'm curious about is in the interim
20 staff guidance in particular, which is where the SRP
21 points, for post-COL activities they continue to keep
22 the notion that says post-COL activities include
23 verifications of plant and sequence-level HCLPF
24 capacity by the COL holder based on as-designed/as-built
25 configuration of the plant before the initial loading

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1 of fuel.

2 Now the sequence-level and plant-level
3 HCLPF capacities are in some sense artifices of the
4 seismic margin analysis approach to life. If at the time
5 of fuel load I have a complete seismic PRA, it's not clear
6 to me what those numerical values indexed to 1.67 times
7 the site PGA really mean any more. So why do we still
8 emphasize that type of comparison post-COL? I
9 understand why at the time of COL issuance it's relevant,
10 because that's all you have, if you went the margins
11 route.

12 This tends to imply to me that either the
13 seismic margin analysis is continued through fuel load,
14 which seems to then imply that the applicant has some
15 sort of dual parallel seismic models because they have
16 the seismic margins analysis that they're using to
17 perform this comparison. But also they are required to
18 have a seismic PRA, because we do have seismic PRA
19 standards in effect and they have to do that by the time
20 they load fuel. So I was curious about that transition,
21 whether you thought about it.

22 MR. CARUSO: Fortunately, I did think about
23 it, but unfortunately I can't answer your question.

24 CHAIRMAN STETKAR: Okay.

25 MR. CARUSO: When I read ISG-20 to

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1 incorporate it in here; and I'm not a big seismic margins
2 -- you know, I've done some of it on ESBWR, but I didn't
3 understand either why post-COL -- if we're talking about
4 new reactors, that we needed that stuff -- and of course
5 I didn't put it in because I said what only matters here
6 is for COLs and DCs.

7 CHAIRMAN STETKAR: Right.

8 MR. HILSMEIER: And I said I better leave
9 it there because somebody put it there. And I can't tell
10 you why it's still there. I can't answer your question.
11 But we can try to get you there --

12 CHAIRMAN STETKAR: But could you look at
13 that and see if --

14 MR. CARUSO: Someone has an answer.
15 Excellent.

16 MR. PHAN: Good morning. My name is Hanh
17 Phan. I am the senior PI analyst in NRO.

18 Please recall that this interim staff
19 guidance was developed by Jimmy Xu. He is the structural
20 engineer, not the PI analyst. So when he put together
21 that particular guidance, he focused on the informations
22 in Chapter 3 and Chapter 19.

23 After we issued that interim staff
24 guidance, we got together, you know, internally a few
25 times to ensure that who responsible for this analysis

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1 after we issued the certification and the COLs license.

2 From PI perspective, from Chapter 19
3 perspective, we will supersede the PRA SMA. We will
4 expect that the COLs holders will develop a PRA and that
5 what we use for Chapter 19 for any risk insights and any
6 informations in Chapter 19s updates.

7 For that particular gap, or the margins in
8 the SMAs, that belong to Chapter 3. So the peoples or
9 the reviewers or the staff responsible for Chapter 3 will
10 keep that for their information, but not from the PRA.

11 CHAIRMAN STETKAR: But, Hanh --

12 MR. PHAN: Yes, sir?

13 CHAIRMAN STETKAR: -- Chapter 3; and thank
14 you for the clarification, and with my apologies to all
15 of the civil structural engineers who might be in our
16 midst, those people don't know anything about PRA.

17 MR. AYEGBUSI: We're trying to learn.

18 CHAIRMAN STETKAR: You're very trying.

19 No, my point is that the HCLPF capacity is
20 a plant-level and sequence-level HCLPF capacity. It's
21 not the HCLPF capacity of a particular component out of
22 the context of the PRA. I understand from their
23 perspective, the structural engineers, verifying that
24 the as-designed/as-purchased/as-installed equipment,
25 that pump, or that valve, or that particular wall over

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1 there performs as it was assumed to perform in the PRA,
2 that that is not the same as a sequence-level or a
3 plant-level HCLPF capacity which depends on the
4 sequences in the whole plant PRA.

5 If I change the PRA, my plant-level and
6 sequence HCLPF capacity will be different because I will
7 have different combinations of components contributing
8 to that plant-level and sequence-level result. So you
9 can't disassociate this notion of plant-level and
10 sequence-level HCLPF capacity from Chapter 19 because
11 it's an integral notion in the PRA. Individual
12 components or structural fragilities can be
13 disassociated, but that's not what the guidance says.
14 The guidance says sequence-level and plant-level HCLPF
15 capacity, which is part of Chapter 19, or at least it
16 depends completely on the models from the position.

17 MEMBER BLEY: I agree with John. I think
18 it's worth looking at again because you don't want to
19 -- you have people who have to maintain models they're
20 not using for any purpose.

21 CHAIRMAN STETKAR: And certainly from the
22 structural standpoint you do want to have assurance that
23 the pump, you know, and its mountings and everything in
24 the plant is installed indeed is at least similar or
25 bounded by the fragilities that are used in the seismic

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1 PRA. I mean, and that's important. That is a civil
2 structural engineering discipline, so they need to know
3 what those fragilities were. But this other notion is
4 very different.

5 MR. CARUSO: Well, I might suggest, I mean,
6 since we've taken two-thirds of the information out of
7 ISG-20 and put it in here, and but need to leave ISG-20
8 because of this section --

9 CHAIRMAN STETKAR: Well, that's the only
10 reason they're bringing --

11 MR. CARUSO: -- it raises the issue of
12 perhaps there should be a separate activity to go back.
13 I mean, ISG-20 is going to have to be revised. So this
14 should be probably an issue that's dealt with at that
15 time.

16 MS. MROWCA: Yes, I think we've already
17 agreed that ISG-20 needed to be revised before this
18 meeting.

19 CHAIRMAN STETKAR: Okay.

20 MS. MROWCA: It just hasn't been yet.

21 CHAIRMAN STETKAR: Thank you.

22 MEMBER BLEY: Well, I mean, I guess I have
23 a question now. ISG-20 has been incorporated here.

24 MR. CARUSO: Parts of it.

25 MEMBER BLEY: Only parts? So ISG-20

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1 continues to live even though parts of it are here?
2 Okay.

3 CHAIRMAN STETKAR: Yes, that's the only
4 concern. That's where I found all of this stuff, is in
5 ISG-20. It's not in Chapter 19.0.

6 MR. CARUSO: Ready to move on? No? Yes?

7 MEMBER BLEY: I'm just curious. Does it
8 have a planned home, these other parts of ISG-20? You
9 don't want ISG to live forever. I mean, that's not its
10 purpose. So where would it go? Is there another part
11 of the SRP where it would go?

12 MR. CARUSO: I guess Chapter 3.

13 MEMBER BLEY: Chapter 3? Yes, it could be.
14 Yes.

15 CHAIRMAN STETKAR: As I said, in the
16 Chapter 3 context confirming that the as-built --

17 MEMBER BLEY: Component.

18 CHAIRMAN STETKAR: -- seismic fragilities
19 for structures and components are consistent with the
20 values that are used in the PRA is, you know, a perfectly
21 reasonable thing to do.

22 MEMBER BLEY: Okay.

23 MR. CARUSO: Okay. I'd get about what, 10
24 minutes left? So I'll just go through these different
25 areas and the one that are of a real interest to you maybe

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1 you can stop me and we'll belabor all the different
2 points.

3 We added some review procedures on PRA
4 technical adequacy. I think the most significant input
5 there was about the peer review, the fact that we had
6 said that DCs don't need to do a peer review, but a
7 self-assessment was okay. But the COLs do need to do
8 a peer review.

9 CHAIRMAN STETKAR: MARK, on that; and I'll
10 try to be short, but I won't, are we still okay with DC
11 and COL PRAs being developed to ASME/ANS Capability
12 Category I?

13 MR. CARUSO: Yes.

14 CHAIRMAN STETKAR: That's what this says.
15 I mean, it says it explicitly.

16 MR. CARUSO: Yes, and it's minimally
17 acceptable. And that was one of the things that came
18 over from ISG-03. You know, the fact of the matter is
19 most of them, at least the ones I'm involved in, are going
20 for Capability Category II.

21 All I can say is I think we decided that we
22 weren't going to go back out and try and take the time
23 to re-vet that issue, that we felt it would be better
24 to focus on moving forward towards trying to develop
25 standards that really apply to DCs and COLs, because the

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1 standard we have now doesn't. And Lynn might want to
2 say more about that.

3 So I think, you know, a number of us have
4 the same concerns you do about us saying, you know,
5 that's -- I think we're saying that's minimally
6 acceptable, but I think at the time it felt like because
7 it's a DC PRA and there is so much you don't know, that
8 a lot of things you can't do. And so that would be okay.
9 And I think what we're finding from experience is is that
10 can get pretty close to a Capability Category II.

11 CHAIRMAN STETKAR: Well, I don't want to
12 get into individual PRAs because we've seen at least
13 -- and we don't look at the details that the staff does,
14 but we've looked at a couple and we've seen variability
15 in terms of the scope and the detail in the PRAs. And
16 I agree with you that the applicants seem to be trying
17 to develop PRAs to Capability Category II; at least the
18 more recent ones that we've seen. You cannot meet all
19 of the criteria for Capability Category II in
20 specificity because of lack of some of the information.

21 My point again, going forward though, if I
22 look now to this being guidance for small modular
23 reactors in the next 10 years before we revise this
24 section of the SRP, would it not be better to -- I don't
25 want to specify -- to highlight Capability Category II?

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1 That would telegraph to the applicants and also
2 telegraph to the reviewers, because now the reviewer has
3 an out. And so, well, okay, Capability Category I.
4 They satisfy that pretty easily. I don't need to look
5 at detail. Capability Category II. But with the
6 applicant identifying those areas where they don't. Or
7 Capability Category II and why they don't. In many cases
8 they can't. In some cases they might decide they don't
9 want to.

10 MEMBER BLEY: And looking forward, as you
11 say, I mean, this is for the next design cert that comes
12 along, so trying to clarify that would help. I mean,
13 I think we agree with you that most of the folks doing
14 them have pushed toward Category 2, although sometimes
15 the have anomalous stuff like in failure modes that are
16 missing, that John said. No reason to leave out failure
17 modes for a pump or a valve. That has nothing to do with
18 the status of the design. You know, there are some
19 things that aren't defined well enough to do, but
20 certainly not that kind of stuff.

21 So clarifying that to urge them to do the best they can.
22 And they're also using it to change their designs. So
23 if it's not incorporating the things it could --

24 MR. CARUSO: Well, I think I may have some
25 good news for you:

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1 MEMBER BLEY: Go ahead.

2 MR. CARUSO: On the one hand we have added
3 guidance in that says they do need to look at what they're
4 meeting and what they're not meeting and explain when
5 they're not meeting it -- explain why that's okay. But
6 better than that, we are in the process of trying to
7 develop an actual standard for DCs that actually does
8 that as part of the standard. It does it in a systematic
9 way that everybody understands and agrees and we can
10 endorse it. And we're moving down that path quite
11 rigorously as we speak.

12 MEMBER BLEY: Is this an industry standard?

13 MR. CARUSO: Industry standard. ASME
14 standard.

15 MEMBER BLEY: Oh, it's another one of the
16 PRA standards?

17 MS. MROWCA: Yes, ASME/ANS Advance Light
18 Water Reactor Standard.

19 MEMBER BLEY: Okay.

20 MS. MROWCA: And the whole concept that we
21 had, at least at the NRC, is we saw the variation in design
22 cert applicants and having to go through every single
23 supporting requirement and saying they did or they
24 don't. And as you know, some applicants have claimed
25 that they meet Capability Category III, too. So in this

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1 standard what we said is that we need to pre-think that,
2 what's acceptable in the standard. And we have
3 representation on the Writing Group. Don Dube when he
4 was our SL, he was on it. And now Donny Harrison is on
5 that group.

6 MEMBER BLEY: On the Standards? Yes.

7 MS. MROWCA: On the Standards Group. The
8 ASME/ANS --

9 MEMBER BLEY: The Writing Group.

10 MS. MROWCA: -- Writing Group for this
11 Advance Light Water Reactor Standard. And this is the
12 same message that we spread to the small modular reactor
13 design applicants during pre-application audits and
14 meetings. You know, that's our concept of what the
15 standard should do. And we're actually having a public
16 meeting. We're planning one in two or three weeks to
17 discuss this more.

18 CHAIRMAN STETKAR: So the implications are
19 that Section 19.0 would be revised at the time that that
20 standard was issued? I still looked at going forward
21 in the time that it takes people to revise things in this
22 organization. As long it says Capability Category I
23 according to that cited ASME/ANS Standard, people will
24 hold that and say we don't need to do anything more than
25 this. And your staff will say we're tied because our

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1 guidance says we don't need to review to any greater
2 depth than that.

3 MR. CARUSO: Well, I mean, if we're going
4 to endorse this new standard, we have to have it in some
5 document somewhere, some way. If it's 1.200 or
6 whatever. But we would be able to do that. I don't know
7 if we would actually do it in 19.0. You're correct.
8 That's where we should do it. But we may have an ISG
9 who may do it in 1.200.

10 The other thing that's going on, too, is
11 there is some -- you know, one of the other things that
12 was driving this; not to go back and fiddle around with
13 this statement about Capability 1, is that there have
14 been a number of discussions about removing the whole
15 concept of capability Categories from the standard, I
16 believe. So it was like, you know, let's focus on the
17 standards and then we'll catch up.

18 CHAIRMAN STETKAR: Okay. But, you know,
19 I'm going to stick on this because I'll come back to the
20 Near-Term Task Force patchwork stuff. I don't know when
21 this wonderful ASME/ANS Standard is going to be issued.
22 If it's like the low-power and shutdown one, I'm going
23 to be well dead before it's issued. Hopefully, there
24 might be some SMR applications in the pipeline before
25 I'm dead. Not clear.

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1 So let's take a snapshot looking forward at
2 where we are now. And where we are now is we have the
3 existing ASME/ANS Standard. That's all we have. And
4 we have guidance that says Capability Category I as it's
5 defined in that standard. And I think that's what -- at
6 least that's what I'm questioning. Do we at this
7 snapshot in time want to retain that going forward or
8 do we want to say Capability Category II with
9 justification of --

10 MEMBER BLEY: Not needed?

11 CHAIRMAN STETKAR: -- yes, identifying the
12 places where you don't need it and why you don't need.
13 And as Dennis said, in many cases that justification
14 might be -- you know, we don't have plant-specific data
15 because we don't have a plant. Okay. You know, we don't
16 have procedures for the operators because we don't have
17 a plant yet. But you do have a valve and you understand
18 all of the failure modes of that valve. So saying that
19 I didn't include, you know, two of the failure modes at
20 that point was your decision. So why didn't you do that?

21 MS. MROWCA: Well, we do have an
22 opportunity right now and that is that this standard is
23 a draft version and they are getting ready to ballot.
24 So that's good news.

25 CHAIRMAN STETKAR: Oh, they're that close?

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1 MS. MROWCA: They're that close.

2 CHAIRMAN STETKAR: I didn't know that.

3 MS. MROWCA: However, they're waiting for
4 us because we understand, or at least we feel like one
5 of our responsibilities as regulators is to help our
6 applicants know what we expect when they send in an
7 application. So we said in the absence of a timely
8 standard that we would develop interim staff guidance.

9 So actually we've been working on that in
10 parallel. That mimics some of the information in the
11 standard. It's like a temporary guidance that industry
12 can use like the SMRs, etcetera. Because we know how
13 long it takes to issue a standard and, you know,
14 sometimes it's a race to see which will come first, a
15 regulatory guidance document or a standard and then
16 endorsement of that NRC standard, or that industry
17 standard.

18 And what our plan is, all these PRA
19 standards have been endorsed through Reg Guide 1.200.
20 So eventually that was our plan is to endorse it through
21 there probably with comments. But in the interim, that
22 was our plan. And that's what we'll be discussing in
23 this public meeting coming up.

24 MS. SCHROER: And we think it's important
25 to note that the ISG and the standard mirror each other.

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1 It's not two separate sets of guidance.

2 MS. MROWCA: Basically in the interim staff
3 guidance we are trying to incorporate our comments on
4 what the Writing Group has done, because there some
5 things that we don't agree with at this point. So we're
6 trying to work with them and help them understand what
7 our viewpoint is. And that's why I think they're holding
8 back from putting it to ballot because they want to see
9 what our comments are. And then if they agree, they
10 might revise the standard and then ballot it.

11 MEMBER BLEY: You're getting at something
12 I was going to ask you about. I was wondering if there
13 was any feeling maybe you're getting back from Donny from
14 the Writing Group and the Standards Group that they'd
15 rather negotiate while they do the standard than have
16 something as extensive as 1.200 modifying the standard.

17 MS. MROWCA: I think they would, and that's
18 why they're holding back. I think they're a little
19 frustrated with us. And I understand that, too. But
20 at the end of the day we want to get this right. And
21 so, that's why we needed to communicate what our
22 expectations are and what our comments were on what they
23 were developing, because we thought it was a little
24 different from what we had in mind as to a standard that
25 could help our DC applicants know, you know, what their

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1 expectations were, especially, you know, after we
2 endorsed it.

3 MEMBER SCHULTZ: So, Lynn, if we use the
4 SMRs as an example, how does the interim staff guidance
5 meet up with what is in here, what we're talking about
6 today? Is it an interim step in between the guidance
7 that you're anticipating? That's my first question.

8 MS. MROWCA: Yes, well, the principle was
9 because we know that the current standard, the current
10 PRA standard; which they all are still using, I might
11 say, has information in it about operating experience
12 and operating procedures and as-built walk-downs. And
13 we know that they can't do that. So they have to take
14 exceptions to it. What we found is that different design
15 cert applicants would evaluate those supporting
16 requirements differently. And we did find in the end
17 that each one of them was acceptable. And so having a
18 standard where industry agrees that these supporting
19 requirements should be handled in this way and then us
20 endorse it is probably the most efficient for everyone.
21 So and they are, the SMRs are participating on this
22 Writing Group, as well as COL licensees. So that's good
23 to know that everybody has a piece of what goes into this
24 standard coming out.

25 MEMBER BLEY: One last comment on the SRP

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1 here. All that makes sense, and I know you can't have
2 everything perfect or you never get there, but pushing
3 this a little bit to be aligned with where you think
4 that's going to come out; and part of that's along the
5 line I think of what John was saying, might make a lot
6 of sense. Then we don't have really diverse things
7 sitting there that we don't need.

8 MS. MROWCA: And actually it's a good idea
9 that when -- you know, if this ISG, if we find that that's
10 the best way to communicate our expectations, it can both
11 reference Reg Guide 1.200 as well as SRP 19.0, because
12 we know it takes a while to get everything out. So that
13 would be the most efficient way to communicate our latest
14 expectations.

15 MEMBER SCHULTZ: It can reference and
16 augment what is here.

17 MS. MROWCA: Absolutely. That's what
18 interim staff guidance does.

19 MEMBER SCHULTZ: Yes.

20 MS. MROWCA: Normally we issue it for
21 multiple, you know, reasons like an update to an Reg
22 Guide as well as an update to an SRP at the same time.

23 MEMBER SCHULTZ: Is there a plan associated
24 with identifying expected content of the ISGs? I mean,
25 you said it in sweeping terms; and you did, too, Suzanne,

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1 in terms of the match-up between what is being developed
2 as guidance and what is in the interim staff guidance.
3 But it seems like if you're saying what is happening is
4 they are waiting for us to provide something that can
5 be used so we don't get into a situation where there's
6 ineffective conflict. Are we on top of what is required
7 to be delivered when and what needs to be delivered in
8 order to be successful?

9 MS. MROWCA: Are you talking about from the
10 Standards Group?

11 MEMBER SCHULTZ: Yes.

12 MS. MROWCA: Yes, I think participating in
13 them actively helps us understand what they're doing and
14 where they're going and giving us an ability to influence
15 also. Because I know that they've said that they don't
16 want to issue something and then have the NRC come out
17 and be, you know, in violent disagreement with what they
18 have.

19 MEMBER SCHULTZ: Okay. Thank you.

20 CHAIRMAN STETKAR: MARK, again I'm looking
21 far ahead.

22 MR. CARUSO: Yes.

23 CHAIRMAN STETKAR: And don't worry too much
24 about time. 19.0 is a big thing, so that's why I think
25 we're being a little bit more active on this.

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1 MR. CARUSO: Sure.

2 CHAIRMAN STETKAR: And again, looking
3 forward I don't see a specific slide on it, so I'll jump
4 in here.

5 The review guidance cites conformance with
6 Reg Guide 1.200. And one of the things I noted is the
7 acceptance criteria says, "In the context of the PRA
8 results and insights the term 'significant' is intended
9 to be consistent with its definition provided in Reg
10 Guide 1.200." Reg Guide 1.200 Revision 2 specifically
11 defines the terms "significant accident sequence" and
12 "significant basic event contributor," and I'll focus
13 on the basic events primarily because of my previous
14 comment.

15 It says in Reg Guide 1.200, "The basic
16 events," in other words, the equipment unavailabilities
17 and human failure events, "that have a Fussell-Vesely
18 importance greater than 0.005 or a risk achievement
19 worth greater than 2." That is what determines
20 significance in the context of Reg Guide 1.200.

21 Now, I understand that and I understand when
22 Reg Guide 1.200 was written and I understand when a lot
23 of this other guidance was written it was written when
24 we understood the core damage frequencies to be kind of
25 on the order of sort of around ten to the minus four.

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1 So 0.005 is equivalent to a core damage frequency of
2 about five times ten to the minus seven. So that's
3 determined significant. That's about a half of one
4 percent of the overall core damage frequency.

5 If I look at a new reactor that has a -- pick
6 a number; let's just pick a number, ten to the minus six,
7 which is sort of somewhere in the mix, core damage
8 frequency, 0.005 is now five times ten to the minus nine
9 event per year. That is still one-half of one percent
10 of that core damage frequency, but it's a really teeny
11 tiny little bitty number.

12 And the question that I have is going
13 forward looking at new reactor designs with much lower
14 overall -- hopefully much lower overall core damage
15 frequencies and large release frequencies, do those same
16 notions of risk significance, specific numerical
17 importance values that are listed in Reg Guide 1.200,
18 still make sense? In other words, because for example
19 now people are populating their RAP list based on risk
20 significance. So they're populating their RAP list
21 with anything that has a Fussell-Vesely importance of
22 greater than 0.005 or a risk achievement worth of greater
23 than 2, except for the ESBWR who use 0.01 and 5.

24 MEMBER CORRADINI: I was waiting. I was
25 waiting.

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1 (Laughter.)

2 CHAIRMAN STETKAR: And they were allowed to
3 do that because they made the argument that those small
4 values didn't make sense on an absolute scale and the
5 staff agreed with them. Is it time to start thinking
6 about that notion?

7 MR. CARUSO: I was the reviewer, so you know
8 what the answer is.

9 (Laughter.)

10 CHAIRMAN STETKAR: Yes, well, I know, MARK.

11 MR. CARUSO: No, seriously. Well, I think,
12 I know, I believe and I think they do that -- and I know
13 the industry does that it doesn't make sense and that
14 you need to address that. The ESBWR did address it.
15 They didn't think it made sense. We agreed with them.

16 I can also tell you that I was in a meeting
17 yesterday where this subject came up on a small module
18 reactor and we had a long discussion about how it didn't
19 make sense and they were looking at something that did
20 make sense. And we said please don't cease and desist.

21 Now, the bad news is that we're, us, the
22 standards, we're all behind that. We're behind. We
23 didn't feel that we wanted an SRP 19.0 to get out in front
24 of what was going on with Reg Guide 1.200 and all that
25 sort of stuff. You know, if you use those guidelines

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1 with a plant that's got a baseline CDF of ten to the minus
2 eighth or ten to the minus seventh or whatever, you know,
3 you're going to get a real conservative list.

4 CHAIRMAN STETKAR: You're probably going
5 to get pretty much everything that you can think of in
6 the plant.

7 MR. CARUSO: You probably are.

8 CHAIRMAN STETKAR: That's the problem.

9 MR. CARUSO: And so you're not to go do that,
10 and so I don't lose a lot of sleep over it.

11 CHAIRMAN STETKAR: Well --

12 MR. CARUSO: And we'll change it just like
13 we're talking about these other parts.

14 CHAIRMAN STETKAR: But somebody has to do
15 something somewhere. I mean, this is part of --

16 MR. CARUSO: The industry is doing it and
17 we're --

18 CHAIRMAN STETKAR: Well, but the problem is
19 do we get to the situation we have now where one applicant
20 populates their list based on these specific criteria?
21 Another applicant uses another set of specific criteria
22 and we say, oh, okay, it makes sense what you did, you
23 as an individual applicant. A third applicant might
24 come in with different numerical criteria from the first
25 two and we say that kind of sort of makes sense, you know?

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1 Isn't it time to sort of think about this in a larger
2 perspective?

3 What is risk significance when we start
4 thinking about plants that have very low levels of risk?
5 How do we measure that risk significance? How do we use
6 that notion of risk significance in our regulation, in
7 our reviews? And it's more than just Chapter 19.0.
8 It's Chapter 17.4, it's Chapter 19.4, it's the reactor
9 oversight process, it's the Maintenance Rule, it's
10 everything. And we can't keep doing it piecemeal,
11 because if we keep doing it piecemeal, I ask questions
12 and you say, yes, we're kind of working on that. We're
13 going to develop some special ISG over here and we're
14 going to look at things on a case-by-case basis. And
15 yet we're left with this sort of mixture of things.

16 So I'm questioning; and, you know, Dennis
17 mentioned, who takes the lead on this? Do we wait for
18 the industry to propose something? And if so, fine, but
19 is the industry looking holistically about all of these
20 issues or are they also just pigeonholing specific
21 topics? I am only looking at core damage frequency from
22 internal at-power events because I know that that's the
23 most important thing today.

24 MEMBER CORRADINI: But, I mean, I don't
25 understand a lot of what you're getting at, but

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1 empirically the answers to your questions are yes and
2 no. Yes, they're letting the industry lead, and no it's
3 not consistent. That's what I hear.

4 CHAIRMAN STETKAR: Okay.

5 MEMBER CORRADINI: And it seems like
6 everybody is very comfortable with that only because
7 they're -- I don't know why they're comfortable. You're
8 not comfortable.

9 CHAIRMAN STETKAR: I'm not comfortable.

10 MEMBER CORRADINI: But it strikes me that
11 they're comfortable because it must be a low activity
12 level on all people's part. This is the easiest thing
13 to do at this point. It's not necessarily the right
14 thing to do, but it's the easiest thing to do. That's
15 my empirical observation.

16 CHAIRMAN STETKAR: You know, if I have a
17 paper -- if I'm some poor person who's eventually going
18 to maybe buy one of these things and try to operate it,
19 and I'm sitting out here -- I have a paper plant right
20 now and if the paper plant pushers are saying this is
21 the most expedient way to duck the issue and the paper
22 pushers create for me a horrendous amount of items that
23 I need to keep track of simply because they didn't think
24 through the process, I'm going to be pissed.

25 (Laughter.)

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1 MEMBER CORRADINI: I guess --

2 CHAIRMAN STETKAR: I'm really going to be
3 pissed.

4 MEMBER CORRADINI: I'm not disagreeing
5 with you. I'm just simply saying it strikes me that when
6 there's a lull in activity, this is the chance to clean
7 things up --

8 CHAIRMAN STETKAR: Exactly.

9 MEMBER CORRADINI: -- going forward.

10 CHAIRMAN STETKAR: Exactly.

11 MEMBER CORRADINI: So it's more of a
12 generic issue and this is one that you've been watching
13 and fussing about, but --

14 CHAIRMAN STETKAR: For four years. And
15 this is the time --

16 MEMBER CORRADINI: -- this is a generic
17 -- this is the time you want to clean things up.

18 CHAIRMAN STETKAR: Yes.

19 MEMBER CORRADINI: Okay.

20 CHAIRMAN STETKAR: Yes.

21 MEMBER CORRADINI: I agree.

22 CHAIRMAN STETKAR: Exactly.

23 MS. MROWCA: I think you have a point.

24 CHAIRMAN STETKAR: Yes, thank you.

25 MS. MROWCA: You have a point, because I

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1 think especially with SMRs coming in a very, very low
2 sequence that each one of them will probably take a
3 unique approach to this. And so, why not have us
4 pre-think what we would accept?

5 CHAIRMAN STETKAR: That sounds like a
6 really good idea.

7 MEMBER CORRADINI: This is not our problem
8 since we only do technical things presented to us. But
9 if you ask that question, I think what you're going to
10 find is is that right now nobody wants to bite that bullet
11 for reasons that I don't understand, but they're not
12 biting. Is that your impression, Mr. Chair?

13 CHAIRMAN STETKAR: I don't know why people
14 don't want to bite, and it's not my job to speculate.

15 MEMBER BLEY: Well, MARK told you, if it
16 goes to the absurd point, nobody's going to do it.

17 CHAIRMAN STETKAR: Right.

18 MEMBER BLEY: So, you know, it's still
19 going to come and --

20 MR. CARUSO: You know, they're very
21 complicated questions of organization and resources
22 and, you know, are we going to get these applications?
23 I think basically technically we agree with you. And
24 we do the best we can to try and address these things
25 and we wish we had all the resources and the cooperation

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1 of the industry in general. You know, there's no central
2 body out there that's focused on this. The individual
3 applicants are. I don't want to make excuses, but, you
4 know, I think we're agreeing with you and we're also
5 saying, you know, don't look at us as lazy paper pushers.

6 CHAIRMAN STETKAR: Well, see, the problem
7 is, you mentioned individual applicants are struggling
8 with it. And in some sense, as Lynn mentioned earlier,
9 I think it is incumbent on the Agency to provide some
10 general guidance to the industry of expectations. And
11 in some sense it gives the individual applicants the
12 freedom to propose things that they seem to think are
13 reasonable, which they should have some measure of
14 ability to do that.

15 But it also makes it difficult for our
16 reviewers because it says that if we don't agree with
17 this notion of 0.005 and 2 for very, very low-risk
18 plants, then the individual reviewers are now placed in
19 a situation that they don't know what we agree with.
20 They don't know whether a particular applicant's
21 proposal is reasonably consistent with what we as an
22 agency determine is significant in terms of risk or not.
23 So it makes life difficult for the reviewers also.

24 MR. CARUSO: That's the worst thing about
25 it is that it's --

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1 CHAIRMAN STETKAR: That's right, and
2 that's why the SRP ought to provide some general notion
3 for our reviewers also and at least tell the industry
4 what the expectations are. If they want to come in with
5 a different proposal, you can at least then look at the
6 proposal as was done with the ESBWR and say, okay, well,
7 you seem to have justified it. Okay relative to our
8 current snapshot.

9 MS. MROWCA: And I think maybe this is
10 something that we can bring up to the industry because
11 a lot of times that's what happens is they propose
12 something and then we endorse it. In the absence of
13 having that kind of guidance is when I talk about the
14 NRC trying to issue something, you know, some kind of
15 regulatory guidance to help with our expectations. So
16 I think that this may be a good opportunity to bring it
17 up to industry as part of the standard.

18 CHAIRMAN STETKAR: Okay.

19 MR. CARUSO: Okay. So are we finished
20 talking about PRA technical adequacy?

21 CHAIRMAN STETKAR: Yes.

22 MR. CARUSO: Okay. Let's see if --

23 (Laughter.)

24 CHAIRMAN STETKAR: Does anybody else have
25 anything?

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1 (Laughter.)

2 MR. CARUSO: So we also added some review
3 procedures that were specific to passive designs, and
4 primarily this was -- we incorporated essentially the
5 review approach that we took for passive system
6 thermal-hydraulic reliability uncertainty in the ESBWR
7 and the AP1000, which we discussed at length with you
8 during the ESBWR review.

9 MEMBER CORRADINI: I don't remember it.
10 Can you summarize it in 25 words or less?

11 MR. CARUSO: Sure. I mean, basically we
12 said we need to focus on, you know, how do the
13 uncertainties in passive system thermal-hydraulic
14 phenomena affect the success criteria in the PRA.
15 That's where the linkage is. You know, how many squib
16 valves do you need to pop open?

17 MEMBER CORRADINI: So you basically you did
18 sensitivities where you looked for essentially an edge
19 for between the success and failure, was what I remember.

20 MR. CARUSO: Yes.

21 MEMBER CORRADINI: Using the squib valves
22 as the example.

23 MR. CARUSO: They did sensitivities and
24 then they said, okay, we'll -- they looked at -- well,
25 they identified what are the parameters we care about,

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1 you know, heat transfer coefficients following pipe
2 sizes and different things, phenomena. And then varied
3 those and looked at what they did to success criteria.
4 And then they also looked at just varying success
5 criteria and seeing how that affected core damage
6 frequency. And then I think they used a rule of thumb
7 of saying, well, you know, we'll add in -- we'll take
8 n minus one as a way of -- based on these studies as a
9 way of choosing -- you know, trying to choose
10 conservative success criteria. And then we'll look at
11 how does the CDF change in the region of that level of
12 success criteria? In other words, you
13 know --

14 MEMBER CORRADINI: Well, that's what I
15 remember. I just wanted to make sure I remembered
16 correctly.

17 MR. CARUSO: Right. So that was the
18 approach. You know, we don't prescribe in the SRP you
19 have to do exactly that, but that they need to address
20 it. The things that we do say is, you know, if you're
21 going to use the MAAP Code to do these kinds of
22 sensitivity studies, you need to benchmark it with a code
23 that can address the phenomena correctly or as
24 rigorously that you would have in a severe accident or
25 a beyond-design-basis accident. You need a code like

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1 TRAC or RELAP or whatever. That was one of the things
2 that -- you know, issues with the ESBWR was they used
3 TRAC, but they used the version that had been, you know
4 -- we had already looked at it in the sense of for Chapter
5 15 events where it never even uncovered the core. And
6 we said you better have something that's addressing
7 thermal-hydraulic phenomena that you might get in as
8 well.

9 MEMBER CORRADINI: That's fine. You
10 answered my question.

11 MR. CARUSO: Okay. And the other thing we
12 added in there was just this connection between, you
13 know, you need to do the regulatory treatment of
14 non-safety systems for the passive designs, and that
15 involves doing these sensitivity studies of the
16 importance of non-safety systems. And it just points
17 the PRA reviewer saying you need to do this and you need
18 to coordinate with whoever else is doing the rest of the
19 RTNSS review.

20 Review procedures specific to iPWRs.
21 There isn't a lot there. The first bullet is
22 -- basically what we did at the time was we had been
23 thinking about this issue of multi-module. You know,
24 I'm going to have coupling in these plants. I may have
25 significant coupling between the modules which may

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1 raise, you know, the dependencies, common cause
2 failures. It may raise, you know, risk concerns about
3 having, you know, accidents on more than one module at
4 a time. And so, we were concerned about this. And what
5 we did at the time was basically put them on notice that
6 they need to address it. But we didn't say here are our
7 expectations for how to do that.

8 The good news is that we have realized; we
9 realized then that we needed to do that, and we're
10 working on that now. We've put together a small group
11 to think about what would be ways to approach this and
12 what would be our expectations and what are the policy
13 issues. And we're working that right now inside our
14 group and in the NRC. And the industry is also
15 proactively thinking about how they're going to do it,
16 at least the two -- you know, the iPWR vendors.

17 MEMBER BLEY: Well, the SMR folks in your
18 organization are coming to talk to us soon on their
19 design-specific reviews. So they're modifying the SRP
20 for mPower right now. Are you guys --

21 MR. CARUSO: No.

22 MEMBER BLEY: -- coordinating with them at
23 all?

24 MR. CARUSO: We are like this.

25 (Laughter.)

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1 MEMBER BLEY: That's what I want to hear.
2 So are you working on it?

3 MR. CARUSO: I've been working on it for two
4 years.

5 MEMBER BLEY: Okay. So it is all one --

6 MR. CARUSO: I live on their floor.

7 MEMBER BLEY: -- thing?

8 MR. CARUSO: Yes, it is all one thing.

9 MEMBER BLEY: Okay.

10 MR. CARUSO: But this particular issue is
11 not going to be reflected -- I don't want to disappoint
12 you. You won't find anything in those DSRs that talk
13 about this problem.

14 MEMBER BLEY: Okay.

15 MR. CARUSO: So we're getting there. And
16 all we've got in 19.0 is, you know, you need to look at
17 it and address it and we're going to look at it, but we
18 all need to figure out how we're going to do that. You
19 need to figure out how you're going to address and we
20 need to figure out what it is will be acceptable to us.
21 So we had a very good meeting yesterday. So we're moving
22 down the road here and it is a little stressful because
23 things are approaching quickly. And, you know, we
24 expect to get an application in early 2015. So, but I
25 think we're making good progress.

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1 MEMBER SCHULTZ: Well, MARK, that's what I
2 was trying to get to, coordination between what's
3 ongoing in the industry activities associated with the
4 guidance and what's here. And then you say there's an
5 additional activity working to flesh out more detail
6 associated with what we see here, which is essentially
7 associated with those two bullets, general
8 descriptions. One must consider these important
9 different features for SMR. So a lot of work to be done,
10 but the coordination of it coming together at the right
11 time, I think is what Dennis was trying to get to, to
12 see whether we're going to be successful.

13 MEMBER BLEY: Well, and there's another
14 part of that coordination. You know, part of this issue
15 deals with the operators. And part of that is tied up
16 in the human factors engineering section as well. Is
17 that being done, you know, kind of in coordination? Same
18 people involved so that we make sure what we say in human
19 factors engineering aligns with what we say about
20 looking at the risk from multi-module events?

21 MR. CARUSO: Yes. I mean, it's very clear
22 to everybody that's involved that some of the things that
23 are being suggested for these plants in terms of
24 operations and having operators operate, you know, more
25 than one module or having fewer operators in the control

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1 room that there are risk implications to that, and that
2 that is a big piece of where that will end up. So I don't
3 think there's any question about that. And that in part
4 of the stuff that we're doing, you know, we're thinking
5 about that, how to factor those things.

6 And we know that the SMR vendors are
7 thinking about that, too, because we've met with them
8 and talked with them and they understand that that's an
9 issue that needs to be -- operations needs to be factored
10 in, not just, you know, do I have all these modules in
11 a big pot or water, but how are they being operated and
12 are there dependencies that are associated with the
13 operators that have to be addressed?

14 The other thing we put in here was some
15 general guidance about looking at shutdown and low
16 power. And this really came out of our pre-application
17 audit of NuScale where we realized, you know, here's a
18 design where the refueling operation is a completely
19 different animal than you've ever seen in any PWR before.
20 And, you know, all the stuff that's been for shutdown
21 risk and shutdown issues and the concerns with shutdown;
22 you know, a lot of them are still there, but there's a
23 whole new bunch of things going on here that you have
24 to worry about that, you know, are part of the existing
25 PWR shutdown risk models and analysis. And so --

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1 MEMBER CORRADINI: I have a question about
2 this. This doesn't relate to the particular licensee
3 you mentioned, but we had a side meeting about another
4 licensee. But functionally it's the same. So, I mean,
5 you've got to move the fuel. They just happen to do it
6 in a different way. So in a functional basis is it that
7 substantially different? Functionally it's the same.
8 I just do it in a different way. So does the SRP have
9 to be so specific that I essentially would then have to
10 have it reinvented for something that all the functions
11 are exactly the same?

12 MR. CARUSO: Well, I'm not talking about
13 pulling fuel bundles out of the reactor and putting the
14 over here and doing that.

15 MEMBER CORRADINI: I understand.

16 MR. CARUSO: I'm talking about all of the
17 activities that go on during --

18 MEMBER CORRADINI: Oh, you mean --

19 MR. CARUSO: -- the outage that could
20 affect safety.

21 MEMBER CORRADINI: Right. So then it's not
22 just that particular licensee? It's any multi-unit,
23 connected multi-unit design?

24 MR. CARUSO: Right. And what we've done
25 here is --

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1 MEMBER CORRADINI: Okay. All right. I
2 misunderstood you.

3 MR. CARUSO: -- we've put very high-level
4 guidance in that goes above what you do for a current
5 PWR and it uses the concepts that are there that we've
6 developed, the high-level concepts for shutdown PRA,
7 which are -- you know, you've got to section it up into
8 the operating states. What are the states I'm in that
9 I moved from? You know, I de-pressurize, I decouple,
10 I reduce level. And we've just said, you know, you need
11 to focus on those areas. So we tried to pick out the
12 modeling of shutdown risk at a high level. And when you
13 do that, you end up with something that can apply to
14 anybody. Even the old PWRs had it. So we felt that it
15 was important to bring that high-level guidance out and
16 put it in here because --

17 MEMBER CORRADINI: Okay.

18 MR. CARUSO: -- you may need to use that to
19 approach an animal you've never seen before. And we just
20 wanted to give them some structure on how to do that.

21 MEMBER CORRADINI: Okay.

22 MR. CARUSO: That was all we were trying to
23 do.

24 We didn't put a lot in about level 2 PRA and
25 severe accidents, but we --

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1 MEMBER REMPE: I have a question.

2 MR. CARUSO: Yes?

3 MEMBER REMPE: I guess I could sort of wait
4 until you finish this, but in the Section 19 it doesn't
5 just say confirmatory analysis. It says an independent
6 assessment if the plant responds using MELCOR, or its
7 version of MELCOR. And I know that some of these SMRs
8 that are coming through are considerably different in
9 design such that they did not use the MAAP Code. They
10 actually used the MELCOR Code. And what is the
11 definition of an independent assessment, because is it
12 okay to use MELCOR for both the applicant and the reviewer
13 at NRC?

14 MEMBER POWERS: Oh, yes.

15 MR. CARUSO: Well, yes, I mean, I think the
16 code is --

17 MEMBER POWERS: Absolutely.

18 MEMBER REMPE: I just was wondering.

19 MEMBER POWERS: I mean, we do it in hundreds
20 of application where staff does an independent
21 confirmatory analysis using the code that the licensee
22 has ultimately adopted.

23 MR. CARUSO: I mean, that's our code.

24 MEMBER REMPE: Yes.

25 MR. CARUSO: We think it's the best there

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1 is, so we would use the code. I guess the difference
2 would be that we have different independent people, you
3 know --

4 MEMBER CORRADINI: That's probably the
5 biggest --

6 MR. CARUSO: -- putting the information in
7 the code, developing it and then seeing how things shape
8 up.

9 MEMBER REMPE: So there's no issues that
10 way? Okay. Just wanted to confirm. Thanks.

11 MEMBER POWERS: Yes, in fact, we just
12 yesterday ran into a case where the staff identified an
13 issue because they independently ran the same code that
14 the licensee had run.

15 MEMBER REMPE: In this case though if
16 there's some large difference, they almost will be
17 making almost their own model of the MELCOR analysis.
18 It's not the standard type of situation.

19 MEMBER POWERS: Every time you create an
20 input deck for a code, you're creating a different model.

21 MEMBER REMPE: Yes.

22 MEMBER CORRADINI: But I guess what I hear
23 Dana and MARK was saying to answer Joy is is that then
24 the staff is not just going to take the input model and
25 use it. The staff, if they have issues, might have to

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1 develop something differently. Regardless of the tool
2 being the same, the doer might do it differently and get
3 potentially a different result and then have to resolve
4 why there is a difference.

5 MR. CARUSO: Yes, I believe we have -- we
6 have the money and the plans to develop MELCOR Deck for
7 -- I think they're actually -- yes, they're actually
8 -- it's now in research.

9 MEMBER REMPE: I would imagine that this is
10 coming down the pike and I just was curious what the
11 official NRC response would be.

12 MR. CARUSO: Yes. You're right, there have
13 been occasions in the past with thermal-hydraulics where
14 we've just simply said give us your input deck and --

15 MEMBER REMPE: And go with it.

16 MR. CARUSO: -- we'll run it in a different
17 code.

18 MEMBER POWERS: Can we come back to your low
19 power and shutdown?

20 MR. CARUSO: Yes.

21 MEMBER POWERS: Because as you adequately
22 pointed out, there are unusual circumstances, because
23 low power by definition nowadays is a rare evolution for
24 people and with small modular reactors it's liable to
25 become a very rare operation.

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1 Do you direct reviewers to look at the kinds
2 of incidences that have shown up in say the ASP analyses
3 for low power and shutdown? I myself find that
4 remarkable, the things that have occurred in the past
5 of couplings between systems that arise only during
6 shutdown to sensitize me to how easy it is to get into
7 a coupled situation that you don't ordinarily encounter.

8 MR. CARUSO: Yes, I think we are very
9 tightly coupled with the operating experience primarily
10 because the people in our group, we all came from that.

11 MEMBER POWERS: Yes, see.

12 MR. CARUSO: And so we have the contacts
13 over in NRR. We look at, you know, what's happening with
14 operating reactors, especially in the area of shutdown,
15 because like you say, that's where, you know, some of
16 these things come from. Like I remember what, the crane
17 drop that --

18 MEMBER POWERS: One of the recent ones.
19 But the ones I love are the drain-down events that have
20 occurred in the past.

21 It's also true that licensees now -- the
22 planned shutdowns do a marvelous job in comparison to
23 what they've done in the past in minimizing the risk
24 profile of their plant, but that still leaves open the
25 unplanned shutdowns.

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1 MR. CARUSO: Well, I mean, I don't think the
2 guidelines that they're using, you know, the NEI
3 guideline or nor our guidance in 88-17 -- it doesn't
4 distinguish between -- it talks about what are the
5 issues? You know, I think NUREG-1449 -- I think a lot
6 of the information out there, you know, that people are
7 using to guide the minimization of shutdown risk talks
8 about, you know, the kinds of things that you -- things
9 are different or you may do something different than you
10 ever did before. And, you know, you have to think about
11 these things. That's about all I can say.

12 CHAIRMAN STETKAR: We do need to be a little
13 cognizant of time here, so let's see if we can finish
14 19.0 before we lose complete interest among the members
15 who are --

16 MR. CARUSO: Flocking to the doors.

17 CHAIRMAN STETKAR: No, I want to take a
18 break after we get done with 19.0. That's an incentive.

19 MR. CARUSO: Well, this was a good segment
20 because on the bullet here, PRA for non-power modes of
21 operation, you know, one of the things we've
22 incorporated is to make sure that the applicants have
23 looked at operating experience and thought about things
24 like the use of free seals and, you know, things that
25 have gone down in the past, the couplings, and see if

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1 they apply.

2 The other thing that we're finding here for
3 new reactors is because we're actually getting PRAs for
4 shutdown operations is that, you know, they're making
5 operational assumptions in these PRAs and sometimes
6 they're about availability of equipment and, you know,
7 we're pushing for, you know, if that's going to be an
8 assumption, then you need to make sure that there's
9 -- you know, you can't just say the operator will do that
10 or should do that. So we've been pushing for
11 availability controls in some specific areas where the
12 assumption very much affects the result of the PRA, and
13 in some cases pushing for tech specs.

14 Treatment of internal fire initiators.
15 We basically endorse in here the use of the FIVE method
16 and the NUREG/CR-6850 as acceptable. Most are using
17 NUREG/CR-6850. We also in our experiences have found
18 that in the DCs sometimes they need to do some
19 simplification to make sort of assumptions because they
20 don't know where all the cables are and everything. And
21 so, we've captured in here some of the stuff we've
22 accepted in the other reviews and codified in the SRP
23 to give reviewers an idea of what are the kind of things
24 that are okay and not okay.

25 Treatment of high winds. We identified an

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1 acceptable source of information for tornado
2 frequencies.

3 And the procedures for specific PRA audit
4 topics. We already talked about this. This is we put
5 this information from digital I&C ISG-03 in there.

6 MEMBER BROWN: Hold it. Now, we go.

7 (Laughter.)

8 MEMBER BROWN: Now did you have something
9 you wanted to say?

10 MEMBER REMPE: Oh, you're going to let me
11 go first?

12 (Laughter.)

13 MEMBER BROWN: I'm going to do that so that
14 I can have the last word.

15 MEMBER REMPE: Oh, okay. I had one
16 question. Mine's probably a lot quicker.

17 In the actual section of the Section 19.0
18 it talks about the instrumentation and how that it needs
19 to survive not only design-basis but severe accident
20 conditions.

21 MR. CARUSO: If it's being relied upon.

22 MEMBER REMPE: I sat through a couple; not
23 all of them like my colleagues, of the design
24 certifications. But how do you ensure that? I mean,
25 what's your definition of where you stop and look and

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1 see that the sensors are surviving the design-basis
2 conditions? What range of sequences are you looking at
3 and do they actually have enough details that they go
4 through the MELCOR MAAP analysis and say, okay, that
5 sensor has to survive up to whatever during a severe
6 accident condition?

7 MR. CARUSO: Well, I think, you know, first
8 we look at, you know, are there some key things that are
9 being relied up to happen?

10 MEMBER REMPE: Do you go through the Severe
11 Accident Management Guidelines for these new plants to
12 decide what the operators are doing?

13 MR. CARUSO: Well, I think it's mostly
14 about some of the design features that are put in, you
15 know, for severe accidents. How are they supposed to
16 work? Like the BiMAC. And so you look at the
17 observation of those systems. And in terms of whether
18 or not they'll survive, are they robust enough, then we
19 coordinate and rely on the actual I&C people to help
20 figure that out. What we do is look at what sequences
21 do we need to consider here? What conditions? What are
22 the conditions during a severe accident that we should
23 be addressing? And, you know, I don't think we've
24 frankly really done much of it.

25 MEMBER REMPE: Yes, I just don't recall

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1 seeing that discussed in some of the --

2 MS. MROWCA: And so, but we thought that it
3 was important to do that and so we've got it in here.
4 And so, yes, I think we wanted in the future to make sure
5 that we have done that, because I think questions have
6 come up in previous reviews about
7 these --

8 MEMBER REMPE: I went through the guidance
9 and I didn't see any explicit instructions to help people
10 understand how they need to meet this. And so, I'm just
11 kind of wondering how they'll --

12 MR. CARUSO: Yes, that's another one of
13 those we need to do this and let's get that in here. But
14 exactly how we do it, it's going to be kind of, you know,
15 we'll have to figure it out when we see it. But I think
16 it would be focused around those systems that are
17 designed to mitigate severe accidents and how are they
18 being turned on? You know, is there critical
19 instrumentation that needs to work that's in the
20 environment to make what they're saying come true?

21 MEMBER REMPE: Yes.

22 MR. CARUSO: And do we agree that it will
23 come true? And the extent of the review for that and
24 the extent of the analysis for that, I'm not sure exactly
25 what it is, and it will be difficult and complex.

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1 MEMBER REMPE: Thanks. Okay. You're
2 turn.

3 MEMBER BROWN: Okay. A just somewhat
4 different level of observation on that whole section
5 under the audit part of it --

6 MR. CARUSO: For digital I&C?

7 MEMBER BROWN: -- which is the
8 design-specific.

9 MR. CARUSO: Yes.

10 MEMBER BROWN: And I did read the part of
11 ISG-03 that looked -- you all kind of grabbed all that
12 and stuck a good proportion of that into this chapter.
13 The one thing that stuck out was where you started
14 providing guidelines. And it was on item 3. It says,
15 "The following guidelines for reviewing are based on
16 lessons learned, etcetera." And then you go through an
17 A, B, C, D. And then after that you go through another
18 listing. I am not going to grind through 22 little
19 details of what to look at and all that other kind of
20 stuff. This is really more a higher-level comment.

21 The first paragraph you said in 3 was said
22 -- and this is out of the ISG. It says, "The level of
23 review of the DI&C portion of the PRA may be limited due
24 to limitations such as the lack of design details, lack
25 of applicable data and the lack of consensus in the

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1 technical community regarding acceptable modeling
2 techniques for determining the risk significance of the
3 DI&C system. The level of review should be proportional
4 to the use of results and insights from the applicant's
5 DI&C risk assessment."

6 I'll make one observation: I don't want to
7 go in -- just let me finish before anybody wants to throw
8 tones at me. That reads almost as if the less that the
9 applicant provides the less we will look at anything.
10 I mean, that's going to be proportional. I know that's
11 not your intention, but that's kind of the flavor you
12 can take away from it if you're looking at this.

13 I don't agree that the level of review
14 should be proportional, number one. As I've stated at
15 numerous of the new design meetings, which you've
16 participated in some of those, as well as some of the
17 other designs, there are four fundamental pillars that
18 we have been insisting having applicants provide
19 functional block diagrams or architectures that show us
20 how they meet those pillars of redundancy, independence,
21 determinacy, diversity, defense-in-depth and then
22 throw in the simplicity thing, which you really can't
23 model at all. Stubbornly insisting on having those
24 functional diagrams even when they didn't exist
25 initially. And then the applicants have then provided

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1 those where we've been able to come through as a
2 committee and provide some guidance or comments in our
3 reports.

4 That functional block diagram approach, in
5 my opinion, is a basic level of modeling that should be
6 utilized to assess and from which you can get sufficient
7 design details that have to be presented. If you don't
8 get those, you can't issue an SER which provides a
9 licensing decision that says that this system is
10 satisfactory for operation and deferring any evaluation
11 of that to six months before fuel load and evaluating
12 all these other little details such as software design
13 failures and other type stuff. You're not going to be
14 changing any of that six months before fuel load.
15 There's half a million lines of code in these platforms
16 for various functions that they want to incorporate.
17 Looking at the failure modes of a microprocessor or a
18 memory card or a whatever, that level is not applicable
19 to what you need to do.

20 So in reality, in my opinion -- we've had
21 one meeting in the I&C Subcommittee already on this
22 addressing -- you're probably familiar with the FMEA
23 approach -- to see how do you model these things. But
24 you ought to be able to take those functional diagrams
25 and insist that you get them and then use that to develop,

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1 okay, a PRA that shows what are the vulnerabilities and
2 what are the communication aspects between divisions,
3 if they do it? What is done relative to the
4 calculational part versus the voting part versus the
5 actuation part at that level and come up with some type
6 of assessment of what's the risk that you could lose one,
7 two or all of these fundamental systems?

8 In other words, do you destroy or damage or
9 reduce your independence or does the processing method,
10 whether it's a main operating loop where everything gets
11 done every time and it spits it out relatively very
12 deterministic, or is it a primarily interrupt-driven
13 computing process where it may have event-driven
14 interrupts that come in and stop the process? That's
15 a higher level and can be assessed based on the level
16 of complexity that the applicant is providing.

17 So I don't think you can say that it's going
18 to be limited and I think you have to have it. If you're
19 going to use PRA for I&C at all, it's got to be done in
20 parallel with the licensing assessment for the SER based
21 on what are the factors that we use to make that
22 licensing? This is not blacksmith technology. It's
23 not a bunch of pumps and pipes and valves which you can
24 go put your hands on, which you can get data on. It's
25 not gravity-fed water flowing down through pipes. I

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1 mean, that's fundamental stuff that's been around
2 forever. But tracing electrons, software data, serial
3 bits, headers and footers on data that's being send from
4 division to division, from division to its own voter for
5 instance, if it's a software. If you have an analog
6 voter versus a computer-based voter, that is an
7 assessment you can make and establish a risk
8 significance to that.

9 And so, if you don't do that in the
10 beginning, I don't think it's very useful. And that's
11 just my personal opinion. This is not a Committee
12 opinion. But I will be voicing this later if we ever
13 get around to writing a letter on this. But if you don't
14 do that, then this whole section should just be chucked.
15 It's not very useful to have this thing arrive six months
16 before fuel load.

17 So that's, you know, fundamentally the
18 thought process I wanted to get across. It was for a
19 record just to provide a different thought process.
20 We've been talking about this for a long time and I've
21 been trying to take the comments from those who are
22 expert in PRAs, which I am not and don't even pretend
23 to start being. But I've just been trying to say, okay,
24 how have I been assessing things? How have I tried to
25 encourage the Committee and the staff to assess things

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1 and see how that would maybe integrate and come up with
2 something. So that's what I've been thinking about and
3 that's what I wanted to provide for the record.

4 MEMBER BLEY: And a lot of those comments
5 were laid out pretty well in the staff design-specific
6 guide for Chapter 7 on mPower.

7 MEMBER BROWN: Yes.

8 MEMBER BLEY: They integrated a lot of the
9 stuff that came from the design reviews into that
10 chapter. So some of that might be --

11 MEMBER BROWN: Well, not my fundamental
12 point is later is not useful for this application. I
13 hate to use the word "paradigm." Instead of "paradigm,"
14 I'd rather use a "concept" for how you apply this to I&C
15 systems. And I just think it has to be different than
16 what we --

17 CHAIRMAN STETKAR: Don't think of I&C as
18 different, because I keep saying I&C is just yet another
19 thing in the plant, the same with people, the same with
20 pumps and pipes and valves. Go for the notion that
21 digital I&C has to be treated separately, at least in
22 a risk assessment perspective.

23 Now, I think what Charlie is saying is that
24 it's incumbent upon the people developing a risk model
25 for that digital I&C system that ought to be designed

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1 according to the principles that he's elaborated. But
2 that risk model is indeed developed from day one down
3 to a level of detail that's consistent with the
4 information that's available, that the risk modelers
5 just don't say, well, this is rapidly evolving
6 technology and it's brand new and it's different so
7 therefore we can put it in a box with a ten to the minus
8 four number. And don't worry, we'll flesh it out later.
9 Because a lot more information is available at day one
10 of the design certification. And I think the guidance
11 in the SRP kind of points the reviewers to look for that
12 detail. It in some cases throw up its hands and says,
13 well, this may not be available, but it at least
14 identifies those things.

15 MR. CARUSO: Well, I think, you know, this
16 ISG was written a long time ago and that statement was
17 written --

18 MEMBER BROWN: That statement was actually
19 written before I became a member.

20 MR. CARUSO: And that's one of the points.
21 It was written at a time when people were thinking a lot
22 in terms of DAC for this stuff and you got to weigh and
23 all that was happening, and also all the issues about
24 software. And fortunately, you know it says "maybe,"
25 but I think, you know, events have overtaken that

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1 statement and because of a lot of the work that you've
2 done and a lot of the work that the Committee has, you
3 know, talked about digital I&C and what used to be there.
4 So, and I think we're finding as long as the desired
5 information is there that the PRA analysts are
6 incorporating it in the models and --

7 CHAIRMAN STETKAR: You know, MARK, that's
8 not clear. I've seen some of the PRAs that have block
9 box stuff that I can look at functional block diagrams
10 and see a lot more detail of. So be careful. It's
11 different from --

12 MR. CARUSO: In my mind though it's
13 different pages of fault trees and --

14 MEMBER BROWN: Let me give one example,
15 okay, just to illustrate the concept. If you look at
16 AP1000, we found -- in ESBWR it worked kind of the same
17 way. We finally got a; it used to be ESBWR, breakdown
18 within a division of pieces. There was a calculational
19 piece and there was a voting piece and they had separate
20 processors and things like that. AP1000 is similar to
21 that. That detail in itself provides where and where
22 they talk to each other. That's a high
23 level, but it's actually detailed enough that you can
24 make a assessment on an engineering basic and
25 deterministic basis, however you want to call it, for

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1 a safety evaluation report decision that says the
2 systems are designed. We have adequate independence.
3 Putting some type of categorization of failures, you
4 know, what is the ten to the minus whatever for some
5 pieces of that, you can think about that in terms of
6 boxes. You can look at applications of processors or
7 other computing-type things and say how do they turn off?
8 How many times does a division just stop operating? It's
9 a higher level, but you can do that. You can do that
10 for some of the pieces between.

11 Trying to assess the software details or if
12 you have to have a hardware watchdog timer, that gives
13 you another thing. Hey, I've got one of those. Now
14 that's different technology, etcetera. How you assess
15 diversity, is there another diverse system? We just
16 finished looking at a backfit application where part of
17 the systems were computer platform-based. The other
18 one were FPGA-based. Totally different. You can
19 assess that and provide some risk of a significant number
20 assigned to that based on some type of experience, at
21 least to start out with, that gives you some feel for
22 what that's like.

23 All I'm saying is it can't come late. It
24 should be done as part of the certification and licensing
25 process to allow that process to be used. That's the

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1 only point I'm trying to make. And too late is too late.
2 That's my opinion.

3 CHAIRMAN STETKAR: Yes?

4 MR. PHAN: My background is in electrical
5 engineerings and I've been participate in PRA for more
6 than 25 years, but not so many years I tried to combine
7 electrical and digital into PRA, and that very complex
8 task. And to me that impossible personally.

9 The staff, personally myself, looking
10 forward to hear more from the ACRS on the guidance, how
11 do those PRA that, you know, to the level of details that
12 we address of the digitals functions and the datas and
13 the testings into the PRA. But for now for the DC
14 applicants the use of PRA is very limited for DRAP or
15 for risk insight. That's why we look into the
16 high-levels models in the PRA. That's why we did not
17 look into very details because we not using that for any
18 significant decision making. But whereas in the future
19 when they use PRA for 50.69s or other risk-informed
20 applications, the staff wills expect them to models more
21 details and any impact from the PRA on the decision
22 makings might be addressed. But for now at the DC steps
23 we'd like to go to the higher levels because the
24 limitation of the information we have at this point.

25 MEMBER BROWN: Well, I'm not disagreeing

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1 relative to the level. I'm an intermediate standpoint
2 between the total box -- and there are divisions of boxes
3 which you can look at the DC level, and I'd consider those
4 ought to be done. I will -- John wants to interrupt me,
5 so fire away.

6 CHAIRMAN STETKAR: We want to kind of keep
7 it moving here, but I'll just make the comment that on
8 the one hand you're saying, well, they're not using it
9 for very much, so we don't need to look at it in very
10 much detail and they don't need to put very much detail
11 in there, and yet we expect people to identify the
12 dominant failure mode for a fail-to-open limit switch
13 on a particular motor-operated valve. Doesn't that
14 sound a bit different?

15 They're not using a fail-to-open limit
16 switch in the licensing of their plant. They're not
17 basing the licensing of that valve on that fail-to-open
18 limit switch. They're not using a risk-informed
19 licensing of that system. And yet we expect people to
20 say, well, this is the dominant failure mode for that
21 valve going forward. It's the only important thing to
22 look at for that valve. And yet we can black box the
23 whole digital I&C system because people don't pay much
24 attention to it. That to me doesn't sound right.

25 Now, I'll just leave it there. I agree the

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1 models need to reflect the information that's available.
2 Many of the models that we've seen have looked at
3 excruciating detail on transmitters because you can look
4 at a transmitter and black boxed all of the stuff in the
5 middle. Charlie's saying they ought to have models that
6 look at the available level of information. Not in
7 excruciating detail like wire connectors, but the basic
8 logic. And many of them don't.

9 And to use the staff's excuse that, well,
10 people aren't using this, well, they don't use the
11 open-limit switch anywhere and yet we expect people to
12 say, ah, that limit switch is important to risk, so we
13 need to follow that limit switch. So be careful about
14 that.

15 That being said, I think the guidance does
16 point the reviewers to a lot of good things to look for.

17 MEMBER BROWN: Yes, like I said --

18 CHAIRMAN STETKAR: In this particular
19 section there's a lot of --

20 MEMBER BROWN: -- I didn't agree with a lot
21 of the information. A bunch of it's way down in the grass
22 and you need to bring yourself back up and you just --

23 CHAIRMAN STETKAR: Hopefully the modelers
24 have done that, if the people developing the model, you
25 know, have captured that.

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1 MEMBER BROWN: I've never seen any of it in
2 our design certification presentations.

3 CHAIRMAN STETKAR: Right, there's that.
4 (Laughter.)

5 MEMBER BROWN: Absolutely zero.

6 CHAIRMAN STETKAR: Ah, but you've not
7 looked at the PRA stuff either.

8 MEMBER BROWN: There's a good reason.
9 (Laughter.)

10 CHAIRMAN STETKAR: Anyway, see if we can
11 get through this, MARK.

12 MR. CARUSO: Okay. I'll just finish here
13 on severe accident evaluation. We basically just
14 incorporated into the SRP a lot of the guidance that's
15 already in the SECY papers on what the staff should be
16 looking at for severe accident evaluation. We didn't
17 invent anything new.

18 And then the last slide is just about the
19 public review of the SRP. We had a 90-day public review
20 period. We got 22 comments from two commentors. And
21 I'd like to say I used the word here comments were
22 "minor." Changes in language, clarity requested.
23 After I went back and read them, I saw I used that word.
24 They were extremely good comments and we agreed with most
25 comments, and we made changes in the document. They were

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1 good comments and I don't mean to belittle any -- if
2 there's any of the industry folks here that were making
3 those comments to belittle their comments. I think the
4 reason I used "minor" was that the public comment
5 experience with Chapter 19.0 was -- any headache at all
6 was very, very minor compared to the headache of 19.3,
7 which we'll talk about this afternoon.

8 MEMBER BLEY: So they didn't cause you a
9 great deal of trouble to incorporate them?

10 MR. CARUSO: Right. And they were good
11 comments. They were positive comments that actually
12 added value to the document.

13 CHAIRMAN STETKAR: Any more questions from
14 the members on Section 19.0?

15 MEMBER BROWN: No, no question. Just a
16 comment.

17 CHAIRMAN STETKAR: Comments?

18 MEMBER BROWN: Just a comment. No
19 question. I guess the point I didn't finish with at the
20 end was to use this higher level functionally broken down
21 PRA to assess the fundamental process, the factors you
22 use in making your licensing determination in the SER,
23 which are redundancy, independence, deterministic,
24 diversity and defense-in-depth. Use it to assess
25 those, not whether that little piece is going to fail.

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1 That's a different concept.

2 MR. CARUSO: Yes, you're sort of talking
3 about there should be more of an emphasis on more of a
4 qualitative risk assessment of the system as opposed to
5 trying to model it with all the --

6 MEMBER BROWN: Well, even if you can come
7 up and -- I don't care if you use numbers in it or not.
8 If you can say, hey, have I compromised independence,
9 what's the potential for that? Have I compromised the
10 deterministic behavior because of the way it's
11 processed? Have I compromised the redundancy because
12 I've shared data between certain places or whatever?
13 That's the only plan. Trying to use the factors you
14 utilize to make the licensing decision for the I&C
15 architecture for both safeguards and reactor trip
16 functions.

17 MEMBER BLEY: And your language and I think
18 Charlie's -- qualitative is right. There's a great deal
19 of the structure that one needs to analyze qualitatively
20 before you can analyze it quantitatively. And that
21 should be done well. And, you know, maybe later we can
22 model some things in more detail, but that part in fact
23 you can do well.

24 MR. CARUSO: And which probably suggests
25 that the people that are doing the modeling, you should

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1 be taking people that are I&C that understand all these
2 things and making them PRA analysts to do it and to review
3 it.

4 MEMBER BROWN: I can't tell you now to do
5 it.

6 MR. CARUSO: I know. I know.

7 MEMBER BROWN: My point to you that I'm
8 trying to get across is --

9 MR. CARUSO: No, I understand.

10 MEMBER BROWN: -- there are fundamental
11 factors we use to make the licensing decision thorough.
12 You want to use the PRA to assess whether their
13 methodology and how they're doing the architectures is
14 going to compromise those four major factors in making
15 a licensing decision, not whether this platform is going
16 to fail in its nuances inside or whether the connector
17 will come loose or whether the data may get garbled or
18 whatever. Maybe garbling data if it's being
19 transmitted a certain way will be a factor. May not be.

20 MR. CARUSO: I find those to be really great
21 comments and very thought-provoking comments. I wish
22 we had more time to talk about it.

23 MEMBER BROWN: I do, too, but we don't.
24 That's why I wanted to get it on the record. It was just
25 a thought. And I'm sorry, John, that I didn't make that

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1 last point I wanted to get across. I quit.

2 CHAIRMAN STETKAR: Anything else on
3 Section 19.0?

4 (No audible response.)

5 CHAIRMAN STETKAR: All right. We're going
6 to take a break. We'll take a 13-minute break. What
7 I suggest is we need to finish by 12:30. We're scheduled
8 to run until 12:00. We do need to finish by 12:30. I'm
9 going to lose members and I have another meeting at
10 12:30. So if the staff can kind of figure out how to
11 make sure you can get the remaining sections --

12 PARTICIPANT: Who's controlling the
13 members?

14 (Laughter.)

15 CHAIRMAN STETKAR: And we will try to
16 control the members also.

17 This is the biggest section. It covers
18 everything. So let's recess until 10 minutes 11:00.

19 (Whereupon, at 10:37 a.m. off the record
20 until 10:54 a.m.)

21 CHAIRMAN STETKAR: We are back in session.
22 And continue.

23 MR. PHAN: Hello again. My name is Hanh and
24 in my presentation today I will specify the key
25 modifications to the Revision 3 to SRP Section 19.1

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1 entitled, "Determining the Technical Adequacy of PRA for
2 Risk-Informed License Amendment Requests After Initial
3 Fuel Load."

4 The main purpose of this update is to
5 incorporate the regulatory requirements for new
6 reactors to include the applicability of NFPA 805 and
7 to reflects the issuance of Revision 2 to Reg Guide
8 1.200, the addendas to the ASME/ANS PRA Standard and
9 additional PRA-related guidance. It should be noted
10 that there are no new sections or subsections added to
11 the SRP Section 19.1 Revision 3.

12 In the following slides I will identify the
13 key change to each subsections.

14 First, as can be seen on this slides, the
15 titles of the Section 19.1 is modified from the Revision
16 2 as "Determining the Technical Adequacy of PRA Results
17 for Risk-Informed Activities" to "Determining the
18 Technical Adequacy of PRA for Risk-Informed License
19 Amendment Requests After Initial Fuel Load." The new
20 titles clearly indicates that Section 19.1 is only
21 applicable to the risk-informed license amendments
22 requests during the operational phase. Accordingly,
23 the staff remove all guidance relevance to the DC and
24 COLs applications from this SRP section and put them in
25 Section 19.0.

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1 MEMBER BLEY: It seemed to me reading this
2 section, which isn't real long, that it pretty much just
3 says if you want to use your PRA for anything after fuel
4 load, then you have to meet Reg Guide 1.200.

5 MR. PHAN: Yes, sir.

6 MEMBER BLEY: That's pretty much what it
7 says, right?

8 MR. PHAN: Exactly. We reference 1.200.

9 MEMBER BLEY: Okay.

10 MR. PHAN: Yes.

11 MEMBER BLEY: That's what I thought it
12 said. Okay.

13 MR. PHAN: Next slides, please. Okay.
14 First, Sections 1, Areas of Reviews. This section is
15 updated to shorten the history discussion of the ASME
16 and ANS Standards and to ask the transition of the NFPA
17 805 risk-informed performance-base fire protection
18 application to sections applicabilities.

19 Next slide, please. Section II,
20 Acceptance Criteria. This section is updated to
21 include the regulatory requirements in 10 CFR
22 50.71(h) (1), (h) (2), and (h) (3) for new reactors. Text
23 in several places in this section was modified for
24 clarification purposes. Mainly, the following
25 statements were added to Section 2: "If the applicant

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1 shows that its PRA model meets the regulatory positions
2 set forth in Reg Guides 1.200, the technical reviewer
3 should be able to conclude that the PRA is technically
4 adequate. If exceptions to Reg Guides 1.200 have been
5 identified and the staff has determined that the
6 exceptions would not affect the risk results
7 sufficiently to affect the regulatory decision, the
8 staff should also be able to conclude that the PRA is
9 technically adequate."

10 MEMBER SCHULTZ: Hanh?

11 MR. PHAN: Yes, sir?

12 MEMBER SCHULTZ: Here just to be clear, the
13 section now is focusing on a defined application, a
14 license amendment request --

15 MR. PHAN: Yes.

16 MEMBER SCHULTZ: -- versus general
17 risk-informed activities. So here the regulatory
18 decision is again related to license amendment request
19 evaluation?

20 MR. PHAN: Yes. But here we also includes
21 any risk-related decision making.

22 MEMBER SCHULTZ: Well, I would have hoped
23 that, but the title of the section now says license
24 amendment requests after plant operation.

25 MR. PHAN: Yes.

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1 MEMBER SCHULTZ: And I guess maybe that's
2 my question. Why was that specifically chosen, because
3 I see it as overly restrictive compared to risk-informed
4 regulatory activities.

5 MR. PHAN: Yes, the titles right now is
6 pretty long, if you just read that. We put the terms
7 "risk amendment to the license after initial fuel load"
8 because we want to be clear that this sections is not
9 applicable to the DC or COL applications. That's why
10 we tried to --

11 MEMBER SCHULTZ: Okay.

12 MR. PHAN: -- you know, to narrow that.

13 MEMBER SCHULTZ: But there's particular
14 activity, a license amendment request.

15 CHAIRMAN STETKAR: But it does say
16 risk-informed license amendment request, which is
17 different from plain vanilla license amendment
18 requests.

19 MEMBER SCHULTZ: Yes. Well, that's okay.
20 I just thought it was more broadly defined in a different
21 way previously.

22 MR. CARUSO: Well, I think that was the case
23 because originally that was all there was. And now, you
24 know, we've got these things lined up more with the
25 actual regulatory applications. 19.0 is for full PRAs,

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1 which are required for new reactors but not required for
2 operating reactors. So we don't have any SRP that says
3 how do I review a PRA that an operating reactors submits,
4 because he's not going to submit one. But he will submit
5 a risk-informed license amendment and use PRA to do it.
6 And that's what this one is for. So I think that was
7 the genesis of the change, to line these things up with
8 our actual regulatory activities now.

9 MEMBER SCHULTZ: Okay. Thank you.

10 MR. CARUSO: Yes.

11 MR. PHAN: On slide 22, Section III reviews
12 procedures. Section III.1.2, Scope of the PRA Models"
13 updated to include the regulatory requirements in Part
14 52, 10 CFR 50.71(h)(1) that talking abouts the
15 requirements on the scope of the PRA for COLs holders
16 and 50.71(h)(3) that require the COLs holders shall
17 upgrade the PRA required by 50.71(h)(1) to cover all
18 modes and all initiating events no later than the day
19 for which the licensee submits the application for a
20 renewed license.

21 Next one, please. Section III.2.2,
22 Assessment of the TEchnicals Adequacies." This section
23 updated to include the statement follows: "The
24 capability categories needed for each PRA supporting
25 requirements of the applicable PRA standard technicals

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1 elements is dependent on the application. In generals,
2 the staff anticipates that current good practice, such
3 as, Capability Category II of the ASME/ANS Standard, is
4 the levels of details that that is adequate for the
5 majority of the applications. However, for some
6 applications, Capability Category I may be sufficient
7 for some PRA supporting requirements, whereas others
8 applications it may be necessary to achieve Capability
9 III for specific PRA supporting requirements."

10 Next, please. No major changes to Section
11 IV, the Evaluation Findings.

12 No major changes to Section V,
13 Implementation.

14 And the last section, Section VI,
15 References, we added the following documents: NEI
16 05-04, "Process for Performing Follow-On PRA Peer
17 Reviews Using the ASME PRA Standard" and NEI 07-12, "Fire
18 PRA Peer Reviews Process Guidelines." These documents
19 were endorsed by Reg Guides 1.200 and also NUREG-1855,
20 "Guidance on the Treatment of Uncertainties Associated
21 with PRAs in Risk-Informed Decision Making."

22 MEMBER SCHULTZ: A question there and the
23 previous slide, too. The intention here with respect
24 to treatment of uncertainties, right here we've just
25 stated that we've added some references, but the

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1 expectation here is to be consistent with what we
2 discussed in 19.0? I would presume that's the intent.
3 I just haven't matched up what is in the NUREG versus
4 in 19.0 and then in this section as well. But is that
5 the intent? Is that what you're trying to accomplish?

6 MR. PHAN: The specific topic we
7 incorporate from NUREG-1855 on the screening.
8 Regarding Sections V, Step C-1, perform screening
9 analysis to determine the significance of the missing
10 PRA scope or level of details to the risk-informed
11 decision, we reference the step or the guidance in this
12 section to perform qualitative screening and
13 quantitative screening if the scope of the PRA is not
14 a full scope.

15 MEMBER SCHULTZ: Okay. Thanks.

16 CHAIRMAN STETKAR: It seemed the way I've
17 got is, as Dennis said, this whole section basically says
18 do your PRA according to Reg Guide 1.200. Reg Guide
19 1.200 points to NUREG-1855 for the way to treat
20 uncertainties. So this is in some sense just redundant
21 to Reg Guide 1.200.

22 MEMBER BLEY: If you want to use the PRA.

23 CHAIRMAN STETKAR: If you want to use the
24 PRA for risk-informed licensing applications.

25 MEMBER SCHULTZ: Right. That's fine. And

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1 I'm understanding it, but I'm also trying to make sure
2 that things are fitting together appropriately.

3 And on slide 23, if we can go back to that,
4 again it was really just a comment on my part, but it
5 appears this paragraphs casts a fairly wide net
6 associated with the definition of "technical adequacy."
7 And I just have to presume again that was the intent.

8 MR. PHAN: Can you be more specific?

9 MEMBER SCHULTZ: Well, it says in general
10 we could go Category I in some cases, Category II in
11 others, or Category III if everything meets up with the
12 staff's expectations. So it's fairly broad.

13 MR. PHAN: Specifically if you recall the
14 safety evaluations on NEI Topical Report 0609 on the
15 risk-informed tech spec initiated for B. There is a
16 statement in there that the staff endorsed that -- let
17 me read exactly the statement in Section III.0. I state
18 that for the internal events PRA models the assessments
19 is required to considers Capability II of the ASME PRA
20 Standard. If you go to the safety evaluations of the
21 EPRI Topical Report 10.21.467, PRA technical adequacy
22 guidance for risk-informed ISI, in that articulate
23 documents in Chapter 2 there is a tables. That tables
24 only identify 14 supporting requirements at Capability
25 II and one at Capability III.

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1 So each application there are difference
2 expectations. That's why we tried to provides the
3 guidance to other staff saying that we need to focus on
4 each application specifically. They are difference
5 expectation.

6 MEMBER SCHULTZ: Good. Then you've
7 captured the right thing. Thank you.

8 MR. PHAN: Okay. Last one, please.
9 Publics Reviews and Comments. Section 19.1 was posted
10 for 30 days in May 2012 for public comments. No comments
11 received. The finals were issued four months later in
12 Septembers of 2012. And the ends of my presentation.
13 If you have any questions, I'm more happy to answer
14 those.

15 CHAIRMAN STETKAR: Moving to the next one.

16 MR. AYEGBUSI: Yes. All right. Good
17 morning. My name is Odunayo Ayegbusi and I'll be
18 covering the initial issuance of SRP 19.2.

19 19.2 is titled, "Review of Risk Information
20 Used to Support Permanent Plant-Specific Changes to the
21 Licensing Basis: General Guidance."

22 So back in 2002 the current 19.2 content was
23 previously issued as SRP 19, however, in 2007 SRP 19.0
24 that MARK just covered replaced SRP 19, Revision 1 as
25 part of a Chapter 19 rearrangement. So the current SRP

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1 19.2 had existed since 2002 and it retained previous
2 guidance in SRP 19, Revision 1 with some minor editorial
3 changes. Just one key change, minor change is 19.2 was
4 updated to -- the update was extended to be used to
5 applicants pursuant to 10 CFR 52, as appropriate.

6 And that's all I have. Any questions?

7 MEMBER SCHULTZ: Was it considered
8 administrative and then not issued for comment, or was
9 it issued for comment?

10 MS. MROWCA: I think it was issued because
11 I think every time we revise it it needs to be issued
12 for comment.

13 MEMBER SCHULTZ: I would have thought so.
14 I just didn't see consistency in the discussion about
15 issued for comments.

16 CHAIRMAN STETKAR: My only comment: I
17 think, you know, the main body section is written quite
18 well. The only thing I noted is that there's an Appendix
19 B that talks in quite a bit more detail about the
20 integrated decision making process. And I did a word
21 search and the word "uncertainty" never appears in that
22 appendix. It does appear in the main body of the report,
23 but it's typically characterized as did the applicant
24 provide adequate sensitivity analyses to examine
25 uncertainties? The words "sensitivities analyses to

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1 examine the effects of uncertainty" and that notion
2 appears quite often. It does not address the
3 performance of an actual uncertainty analysis and how
4 one really accounts for the actual uncertainties in the
5 decisionmaking process. And I'll only alert you to that
6 because of the lack of time.

7 I happen to think that quantifying; and if
8 you can't quantify, at least qualitatively expressing
9 your degree of uncertainty is much more important to
10 decision making than just saying, well, I did an
11 arbitrary sensitivity analysis. Because when it comes
12 down to it, all the sensitivity analyses are just
13 arbitrary. So I'd point you to that and you may want
14 to think about that.

15 The main part of the document does use the
16 word "uncertainty." I can't say that it does not, but
17 it always does it in the context of sensitivity analyses.

18 MS. MROWCA: We'll note that for the next
19 revision.

20 CHAIRMAN STETKAR: And that's important
21 because quite honestly if we're trying to develop an
22 appreciation among our staff, much less than among the
23 industry, of the importance of looking at uncertainty,
24 thinking about uncertainty quantitatively and
25 qualitatively according to the guidance in NUREG-1855,

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1 which does actually walk through this process. All of
2 our guidance, internal guidance and how we're presenting
3 that to the rest of the world ought to follow that notion.

4 MR. CARUSO: I might make one comment.
5 There is a document that was prepared a few years ago.
6 I can't remember what the LIC stands for, L-I-C, but it's
7 an internal staff document, LIC-501 in NRR, that
8 addresses risk-informed decision making. And I think
9 it, you know, goes beyond this Appendix B and it does
10 address uncertainties, but I'm not sure to what extent
11 it's been coordinated with 1855.

12 CHAIRMAN STETKAR: As soon as you say a
13 number of years ago, it already starts to be
14 questionable.

15 MR. CARUSO: Well, I think the basic
16 structure of it and the steps are all very good and still
17 very applicable, but it may not have gotten -- so far
18 as the uncertainty treatment it may have not gotten to
19 the level of 1855.

20 MEMBER SCHULTZ: And I would agree, Lynn,
21 with your comment that you can hold this for additional
22 consideration for next revisions. I thought when I took
23 at look at what was in 19.0; and MARK had some of it in
24 his slides, that the sensitivity studies and the
25 uncertainty evaluations were reasonably described

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1 there, but I didn't feel there was enough information
2 about why one was being requested to look at the
3 applicant's sensitivity studies or the applicant's
4 uncertainty studies. And I would have expected more
5 details as to why the uncertainty evaluations are done,
6 why the sensitivity studies are done and what
7 expectations there are in terms of, if you will, success
8 criteria. I just saw that, you know, the reviewer will
9 examine sensitivity evaluations and uncertainty
10 analyses. So I think there's ample opportunity to make
11 improvements in those areas and set the expectations
12 more clearly.

13 MS. MROWCA: The timeline for updating SRP
14 19.0 is a little bit longer than probably this SRP
15 because --

16 MEMBER SCHULTZ: I understand that.

17 MS. MROWCA: Yes.

18 MEMBER SCHULTZ: And that's okay.

19 MS. MROWCA: Okay.

20 MEMBER SCHULTZ: But it's a matter of again
21 having the general end in mind and making improvements.

22 MS. MROWCA: Right.

23 MEMBER SCHULTZ: That's okay, making
24 improvements one-by-one, but you have to have an end goal
25 in mind to achieve it piece-by-piece.

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1 MS. MROWCA: Okay. Thank you. I just
2 wanted to add that we do need to update this SRP 19.2,
3 but there are a couple things we're waiting for, and one
4 is this SRP mirrors Reg Guide 1.174 and there are going
5 to be some changes incorporated into Reg Guide 1.174 in
6 terms of defense-in-depth. And that was coming out of
7 some discussions in NTTF Recommendation 1. So until Reg
8 Guide 1.174 is updated, we probably will not update this.

9 There are also some changes associated with
10 risk-informed regulatory guidance for new reactors,
11 some action items that we have from the Commission to
12 incorporate in here.

13 MEMBER SCHULTZ: John, we may need a
14 discussion associated with -- I know you're talking --

15 CHAIRMAN STETKAR: John's taking notes.
16 (Laughter.)

17 MEMBER SCHULTZ: Exactly.

18 CHAIRMAN STETKAR: John's taking notes.

19 MEMBER SCHULTZ: Sounds like a lot of good
20 activities are happening. It would be good to become
21 engaged.

22 CHAIRMAN STETKAR: We will.

23 MS. MROWCA: Can I say that the revision is
24 probably in the longer term for Reg Guide 1.174 than in
25 the shorter term?

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1 CHAIRMAN STETKAR: It's okay, Lynn. We'll
2 engage.

3 MEMBER BLEY: It was revised a year or two
4 ago, right?

5 MR. CARUSO: A draft was put out.

6 MEMBER BLEY: 1.200.

7 CHAIRMAN STETKAR: Oh, was it just a draft?

8 MR. CARUSO: A draft was put out.

9 CHAIRMAN STETKAR: Because I know we looked
10 at it.

11 MR. CARUSO: An EG was put out and it was
12 put on hold to wait for NTTF.

13 CHAIRMAN STETKAR: Ah, okay.

14 MR. LAI: We look at Reg Guide 1.174, Rev
15 2, I think.

16 CHAIRMAN STETKAR: Yes.

17 MEMBER BLEY: Yes, I remember looking at
18 it. I didn't realize it didn't go out.

19 MR. LAI: This is the new one, I guess.

20 MR. CARUSO: Okay. SRP Section 19.3.

21 MEMBER BLEY: Well, before you start, I'm
22 going to whine about the same thing I whined about
23 earlier and then let you go ahead and maybe we'll talk
24 about it some more.

25 We've been struggling with the written

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1 stuff since we first ran across it, and the one thing
2 we kept asking about as we went through the design certs
3 again was related to the PRA. Now this lays out a lot
4 of places RTNSS comes from in addition to PRA, but PRA
5 is still central to it and the PRA is used in a lot of
6 places. And the PRA we're using is the design cert PRA,
7 or the COLA PRA, which we once thought would be more than
8 the design cert PRA, but nobody's doing that. What's
9 still not clear to me is when we get a real PRA before
10 start-up, probably a year before start-up, there's
11 nothing here that says you got to look at that PRA and
12 make sure you did the RTNSS right now that you know more
13 about the risk. Is that true, or did I skip over it?

14 MR. CARUSO: No, I believe that's true.

15 MEMBER BLEY: People kept telling us
16 sometime we'll have guidance on how this will -- we'll
17 make sure that this will all work and I don't think we
18 do yet.

19 MR. CARUSO: Well, all I can say is, you
20 know, when we were asked to make recommendations for
21 changes to Part 52 --

22 MEMBER BLEY: Yes.

23 MR. CARUSO: -- one of the recommendations
24 that we did make was to, you know, incorporate RTNSS into
25 the regulations as opposed to policy. And, you know,

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1 if that becomes the case, then I think that would be a
2 way to do that, what you're taking about.

3 MEMBER BLEY: So we have no way to --

4 MR. CARUSO: Right now it's simply part of
5 the design certification COL application review.

6 CHAIRMAN STETKAR: Let me follow up on
7 this.

8 MEMBER BLEY: Go ahead.

9 CHAIRMAN STETKAR: This goes back into what
10 I was talking about in the RAP. Isn't it time that the
11 Nuclear Regulatory Commission; and I don't care -- SRMs,
12 SECYs, staff, Commissioners, I don't care, take a step
13 back and look at this whole process from a more complete
14 perspective? It strikes me that five specific criteria
15 only for so-called passive designs, several of which are
16 kind of arbitrary deterministic criteria.

17 Gee, ATWS is important so we need to look
18 at ATWS for a passive design. Well, isn't ATWS important
19 for an active plant design? Gee, we need to evaluate
20 risk significant for the RAP based on 0.005
21 Fussell-Vesely importance or risk achievement worth too
22 for the purposes of a reliability assurance program, but
23 not for RTNSS because if it's an ATWS, we have to look
24 at that. We have to call out a RTNSS even if it's
25 completely insignificant. Ten to the minus thirtieth

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1 contribution. Why do we differentiate?

2 I'll tell you why. Because it's been
3 piecemeal. It's because RTNSS came about when people
4 were thinking about AP600 20 years ago. Twenty or more
5 years ago. And now we're going to keep promulgating the
6 same old think for the next 20 years. Isn't it time to
7 stop?

8 I don't understand why we need RTNSS for
9 passive plant designs and not RTNSS for active plant
10 designs. Well, we do have RTNSS for active plant
11 designs. It's called RAP. But the criteria are
12 different. We don't have these five specific things,
13 and basically only five specific things that I need to
14 look at. And yet for RTNSS I need additional
15 "Availability Control Manual" or whatever you call it
16 in addition to my normal Maintenance Rule Program, but
17 I don't need that "Availability Control Manual" for risk
18 significant non-safety-related stuff for an active
19 plant because it's all controlled under the Maintenance
20 Rule. So I just don't understand why we differentiate.

21 MEMBER BLEY: And if it requires something
22 along the lines you were talking and some higher
23 guidance, maybe we should --

24 CHAIRMAN STETKAR: Maybe we should --

25 MEMBER BLEY: -- weigh in on --

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1 CHAIRMAN STETKAR: -- weigh in on that.

2 MEMBER BLEY: -- this and see if we can
3 promote that kind of guidance.

4 MR. CARUSO: I have good news: You just
5 went through all the bad news. The good news is is that
6 in the process of working through the staff's
7 recommendations on dispositioning NTTF Recommendation
8 1, the industry indicated in their comments that one
9 thing they very much wanted to do -- there were a number
10 of things they didn't want to do, but one thing they very
11 much wanted to do was engage with the staff on treatment
12 of non-safety systems. And that's what all of this stuff
13 is about. So I think there is a future activity where
14 some of the things can be fixed for both and we can get
15 some more logical consistent approach for both operating
16 and new reactors.

17 So I think there's an opportunity, because
18 they were very serious about that and I think we had
19 decided -- well, I don't know what we decided, but I think
20 that the staff has indicated -- in fact I think Dick
21 Dudley talked about the last time we were here in NTTF
22 1 about that no matter what happens with the NTTF 1,
23 that's something that the staff wants to engage with the
24 industry, too, on. So that's about all I can say.

25 CHAIRMAN STETKAR: Okay. Good. Thanks.

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1 MR. CARUSO: Okay. So 19.3 is a new
2 section. It only covers passive designs. As you say,
3 the genesis of RTNSS was uncertainty over the use of
4 passive safety systems and the fact that a number of
5 systems that typically had been safety systems; diesel
6 generators, service water systems, are now non-safety
7 systems and we had come to rely on them heavily. And
8 so there was angst in just sort of relegating them to
9 doing nothing and looking at nothing. So, and as John
10 said, this came out of policy that was developed during
11 the '90s for the AP600 and 1000 reviews.

12 SRP 19.3 provides sort of a top-level, sort
13 of a mother document for RTNSS. It captures all the
14 policy guidance that's out there and provides some
15 additional guidance in the area of design of non-safety
16 systems. But in addition to that there's a need for some
17 -- when you get down to particular systems; for example,
18 service water system, that there's additional guidance
19 that needs to go in their review guidance designs. And
20 we have done that for the small modular reactors that
21 are in the design-specific review plans that are going
22 to be coming to you for review. So we haven't gone back
23 to all the other SRPs and modified SRPs, but in a sense
24 we have because we've created these DSRs which could
25 easily be captured back in the SRP. So I think we've

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1 actually done the hard work and it's just a matter of
2 reformatting.

3 So the responsibility for the RTNSS review
4 is very widely spread over the staff. There's the PRA
5 Group that handles the focused PRA studies and the PRA
6 aspects, but there are all these other criteria that need
7 to be addressed and there's also -- now that we've put
8 some guidance in about design, you know, all the other
9 design branches are involved now, too.

10 So let's see. So we've identified six main
11 areas of review for the staff. The first one is the
12 selection, the five criteria. You know, how have they
13 addressed the five selection criteria for scoping SSEs
14 into RTNSS?

15 The second major area is something that was
16 never captured very well at all in the policy document.
17 And we found through our ESBWR review that this was an
18 issue, which is who is looking at whether or not these
19 non-safety systems are going to get this treatment and
20 are being, you know, looked at in the PRA? Who's looking
21 at whether or not they're designed to do what they're
22 saying they'll do? There was never any policy on that
23 in any of those policy papers. You know, if you're going
24 to credit some heat exchanger to function during a severe
25 accident, you know, if designed for design-basis stuff,

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1 who's looking at whether or not what they claim is that
2 it will operate, you know, at a higher delta T or whatever
3 you need?

4 So because this is non-safety stuff, we had
5 a hard road to follow here, which was you can't go
6 overboard and start providing, you know, a whole new set
7 of general design criteria. So we tried to focus in on
8 just a few key issues, which is, you know, have they
9 identified the functional design requirements for this
10 stuff? In other words, if they're going to credit some
11 system with a couple of pumps that can put water in the
12 reactor at low pressure, you know, and they're claiming
13 this is an alternative ECCS system, well, you know, have
14 they used the ECCS accidents that they're crediting it
15 for, you know, as the basis for the design? Have they
16 picked, you know, the functional design requirements
17 correctly as to what it's supposed to do and the basis
18 for it? Mostly the basis. And then have the actually
19 designed it to meet those?

20 MEMBER BLEY: I guess, and here is where my
21 whining about the real PRA when it's done comes up again,
22 because the whole idea of treatment here hinges on
23 establishing a treatment commensurate with the PRA.
24 We're trying to care of the things for which this could
25 contribute to risk. And if you aren't doing that against

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1 the real PRA, you don't now if we've got a program that's
2 useful or not. And I just don't see how this program
3 stands up to scrutiny if it doesn't
4 -- if you don't have to check your RTNSS list and
5 treatments against the final PRA when it's done. There
6 are whole sets of initiators that aren't treated and
7 there's all sorts of things that aren't treated in the
8 early PRAs. And I just don't get it. I don't see how
9 this program is meaningful at all without a final
10 confirmation of RTNSS once that final PRA is done. Go
11 ahead.

12 MR. CARUSO: That's a very valid comment.

13 And then we also asked the reviewers to look
14 especially at, you know, the issue of system interaction
15 between these non-safety systems and the passive safety
16 systems, since that's the central focus of RTNSS.

17 The PRA Group does the focused PRA
18 sensitivity studies, and so SRP 19.3 just points back
19 to 19.0 and says they'll be handling that. Coordinate
20 as necessary.

21 The fifth topic is the Augmented Design
22 Standards for the SSCs that are being relied upon for
23 long-term safety, you know, achieving the plant safety
24 functions in that period between 72 hours after the
25 initiation of an accident and 7 days. And mostly that's

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1 about seismic capability and protection against
2 external events.

3 MEMBER BLEY: Your last little bullet up
4 there is causing me a little trouble because I can't
5 remember back to the design certs. For the passive
6 designs you've looked at and we've looked at -- somebody
7 must have, but I can't remember exactly where it was done
8 -- looked at the possibility of adverse interactions
9 between the non-safety systems. What if one starts that
10 wasn't supposed to start? You know, can that somehow
11 upset the balance in the passive systems? And I suspect
12 we looked at that, but I can't remember.

13 MEMBER CORRADINI: We did for ESBWR. I'm
14 trying to think back how we did, but that kind of escapes
15 me. But we were asking the question since. In that
16 case, in that particular design everything was driven
17 by essentially gravity-based cooling and the
18 high-pressure, the low-pressure -- I don't want to call
19 them flutters, but the high-pressure and low-pressure
20 injection wouldn't adversely affect that. You would
21 essentially get more inventory.

22 MEMBER BLEY: I think we did, but I'm just
23 not sure.

24 CHAIRMAN STETKAR: We looked at spurious
25 opening of those drain to the sump valves that weren't

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1 modeled at all in the PRA as --

2 MEMBER BLEY: See, he remembers.

3 MEMBER SCHULTZ: So that makes more sense
4 to me. I was trying to figure out why this bullet seemed
5 to be derived from some experience; that is, it's phrased
6 "design improvements to minimize adverse interaction."
7 Well, you know, why would one even need to in fact examine
8 that in any detail? But if we've had experience that
9 is identifying those, then --

10 MR. CARUSO: I can answer that.

11 MEMBER SCHULTZ: Go ahead, MARK.

12 MR. CARUSO: One of the five criteria for
13 scoping SSCs into RTNSS is for the applicant to do a study
14 focused on potential interactions of the non-safety
15 investment protection systems and the passive safety
16 systems. And to look and see if there are interactions,
17 you need to get rid of them and anything you need to do
18 to your non-safety system to get rid of them has to be
19 covered under RTNSS.

20 So ESBWR did do that study. We did review
21 it and discussed it in the SER.

22 MEMBER SCHULTZ: That's the background I
23 was looking for.

24 MR. CARUSO: That's the background.

25 So basically we identified the areas of

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1 review and identified for the reviewers the key
2 acceptance criteria that the applicants needed to
3 satisfy. You know, we look at their selection of SSCs
4 according to the criteria and we check to see that
5 they've addressed them correctly. As I said before, the
6 individual systems reviewers of say service water or
7 diesel generators look to see that the functional design
8 requirements are correct and that they've satisfied
9 them.

10 We review the study of adverse interaction
11 between passive and active systems and assure that
12 they've removed any adverse interactions. We review
13 the sensitivity studies as part of the Chapter 19.0
14 review, the PRA sensitivity studies for the focused PRA
15 and we look at their proposed treatment, particularly
16 in the area of availability controls. You know, are they
17 proposing tech specs for things that are especially risk
18 significant? Are they proposing availability controls
19 where necessary?

20 The Commission's policy indicates that for
21 all the SSCs that are relied upon for the long-term
22 safety and the long-term satisfaction of safety
23 functions that all those SSCs do have availability
24 controls. So we look at that. As I said, we look to
25 see if it appears appropriate that they should be

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1 establishing tech specs in accordance with 5036
2 Criterion D for any highly risk significant SSCs.

3 MEMBER SCHULTZ: MARK, can we go back to
4 that slide? MARK, can you help me with the middle bullet
5 on sensitivity studies, because it sounds to me, not
6 having done it -- or we say, you know, sure, that focused
7 studies are adequate, but that's not much of a specific
8 acceptance criteria.

9 MR. CARUSO: Right. Yes.

10 MEMBER SCHULTZ: And I understand from
11 previous discussions and from the document that there
12 are specific things that are intended to be done
13 associated with identifying what happens if they're not
14 there, what happens if they're there and so on and so
15 forth. And we talked about interactions. But just to
16 say we want to be sure they're adequate doesn't seem to
17 meet any kind of test to me.

18 MR. CARUSO: Well, you know, that review is
19 done under Chapter 19.0 and what it is is, you know, the
20 sensitivity study is to remove from the PRA basically
21 we take no credit for non-safety systems --

22 MEMBER SCHULTZ: Yes.

23 MR. CARUSO: -- and look and see what your
24 results are. And if you're still showing that you meet
25 the safety goals, then we would suggest that that result

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1 would not cause you to identify any SSCs for RTNSS based
2 on that criteria.

3 MEMBER SCHULTZ: Yes.

4 MR. CARUSO: So in looking at that, you
5 know, we were looking at the over -- I mean, you're using
6 a base PRA, so --

7 MEMBER SCHULTZ: Right.

8 MR. CARUSO: -- we're already reviewing
9 that. So you're reviewing that. You're looking at, you
10 know, if they don't meet the safety goals; in other
11 words, they take all the non-safety equipment out and
12 they go above the safety goals, then you look at how are
13 they adding non-safety systems back in? You know, how
14 are they choosing which ones to add in first? How are
15 they arriving at, oh, these are the few that are really,
16 really important and have the bulk of the risk
17 significance that could take you back above the safety
18 goals?

19 And so most of the focus on the sensitivity
20 study is, you know, whether or not we agree with what
21 they're coming up with in terms of this one or this two
22 -- you say, well, one, two, three. How many non-safety
23 systems should you be scoping in based on that? And so,
24 there's not a real hard fast criteria. It's really more
25 of a review of what they're doing and does it make sense

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1 and, you know, why is digital I&C showing up? That's
2 the one that keeps showing up for the two plants we looked
3 at as the most important functions, non-safety
4 functions. And, you know, even that one, we understand
5 it. It's basically, you know, assumptions about the
6 common cause failure probabilities that make the diverse
7 protection safety become very important when you have
8 failures of the safety system.

9 In addition to those sensitivity studies we
10 indicate you need to somehow address uncertainty in the
11 PRA, but not in a very quantitative way. But you do need
12 to address it. And the way it's normally addressed is,
13 you know, what else can you offer up to go in RTNSS to
14 cover uncertainty? ESBWR basically identified several
15 systems that didn't satisfy the criteria of being, you
16 know, particularly risk significant when you put them
17 back in as available. But they said, you know, these
18 systems are direct backups for the passive systems. And
19 so we're going to add those in. And we see that as some
20 means of addressing uncertainty. So it is kind of artsy.

21 MEMBER SCHULTZ: It is kind of that, but is
22 there a functional diagram, for example, that you do the
23 sensitivity studies that you just described and you find
24 the RTNSS that are important? Is there a functional
25 diagram that says, okay, now go back and review what

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1 you've done in terms of identifying the adequacy of the
2 design requirements and the assurance of the design and
3 that for those that are most important you're focusing
4 hard to make sure that the design requirements are met
5 and that the assurance is provided for those particular
6 components? You know, it is artsy, but you could set
7 up a process that would perhaps provide some more
8 assurance that --

9 MR. CARUSO: Well, I think for the
10 design --

11 MEMBER SCHULTZ: -- the evaluation is done
12 appropriately.

13 MR. CARUSO: For the design question, those
14 are showing up in the individual design-specific review
15 standards for those systems.

16 MEMBER SCHULTZ: Okay.

17 MR. CARUSO: There's more guidance in there
18 as to how I decide whether or not they got the design
19 stuff right.

20 MEMBER SCHULTZ: Yes.

21 MR. CARUSO: As far as the focused PRA
22 sensitivity study, there isn't any.

23 MEMBER SCHULTZ: Okay. Something to
24 consider. Thank you.

25 CHAIRMAN STETKAR: MARK, I had one. When

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1 I look at the Section III review procedures, there's an
2 introductory paragraph to that section that discusses
3 all passive light water reactors and in applying the
4 review to in particular designs of small modular
5 reactors.

6 A couple of bullets under there. One
7 bullet got my attention and it discusses how a
8 risk-informed graded approach to the review might be
9 used. And one of the bullets says, "RTNSS B SSCs may
10 have testing in inspections, tests, analyses and
11 acceptance criteria, ITAAC, because of the augmented
12 design standards they must meet, whereas testing in
13 ITAAC for other RTNSS SSCs would be unlikely." I don't
14 know why we're focusing on RTNSS B, which is three days
15 to seven days, which is one of the arbitrary five
16 categories. Why is it unlikely that we would have ITAAC
17 for RTNSS equipment that, for example, during either
18 power operation or shutdown keeps my core damage
19 frequency less than ten to the minus four or my large
20 release frequency less than ten to the minus six, which is
21 RTNSS Category C?

22 MR. CARUSO: Well --

23 CHAIRMAN STETKAR: You know, and a couple
24 of your slides have specifically focused on RTNSS B.
25 Because everybody knows that's the most important thing

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1 or because that was at the time the AP600 was issued the
2 only thing they identified?

3 MR. CARUSO: This is all based on the policy
4 papers that were written. We didn't go back and start
5 revising Commission policy. And those --

6 CHAIRMAN STETKAR: Yes, but you know --

7 MR. CARUSO: -- which policy says --

8 CHAIRMAN STETKAR: -- did the policy say
9 that ITAAC are unlikely except for anything other than
10 RTNSS B?

11 MR. CARUSO: No. No. No.

12 CHAIRMAN STETKAR: I mean, why do we need
13 to say that today looking forward to SMR designs?

14 MR. CARUSO: Well, there was a desire on a
15 number of the reviewers that, you know, we try and say
16 something about -- not say that, you know, RTNSS B is
17 everything and RTNSS C is nothing, that there should be
18 some gradation. And so, we were struggling with the
19 language to try and say that there might be some cases
20 -- we probably said it wrong, because it's kind of
21 negative the way it got said.

22 CHAIRMAN STETKAR: If I'm a reviewer, it
23 says if somebody didn't propose ITAAC for something that
24 falls in RTNSS because of Category C or any one of the
25 other, you know, three categories, I don't need to worry

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1 about it because it's unlikely that that would be
2 important.

3 MR. CARUSO: Well, the other thing to
4 consider and think about is RTNSS is not the criteria
5 for whether or not you identify ITAAC for non-safety
6 systems.

7 CHAIRMAN STETKAR: That's true.

8 MR. CARUSO: We can identify yourself ITAAC
9 for non-safety systems. We do it for, you know,
10 non-passive plants. If we think non-safety system is
11 really important and that they've left some stuff out
12 like, well, we'll get to that later on -- you know, I
13 mean, we identified ITAAC for systems that were put in
14 place for aircraft impact. So that's why I, you
15 know --

16 CHAIRMAN STETKAR: You just may want to --

17 MR. CARUSO: -- this was an area that we
18 struggled a lot with.

19 CHAIRMAN STETKAR: If you're looking at
20 revising this, you may want to look at that --

21 MR. CARUSO: Yes.

22 CHAIRMAN STETKAR: -- because it does give
23 the impression that RTNSS B is the whole world and
24 everything else is just sort of there because it was
25 listed in a list.

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1 MR. CARUSO: Well, I know you get that
2 impression. That's the way the policy stuff is set up.

3 CHAIRMAN STETKAR: Okay.

4 MR. CARUSO: Only RTNSS B has augmented
5 design standards. Only RTNSS B requires availability
6 controls.

7 Okay. So we had a 90-day public review
8 period. We had lots of comments from a number of
9 organizations, all the vendors, NEI. There was a lot
10 of confusion about the expectations for RTNSS B SSCs.
11 We did originally have in the SRP that went out an
12 approach for external events that was sort of suggesting
13 you do kind of a graded version of what you'd do for GDC
14 2 for is for non-safety systems. And they were very
15 concerned about associating the general design criteria
16 to non-safety systems. And we went back and thought
17 about that and said, yes, that's probably not a good
18 thing to do. We need to make it very clear just exactly
19 what they need to do for non-safety without invoking GDC.

20 There was a concern on our part, and rightly
21 so, that in a lot of areas it talked about doing things
22 and they said, you know, this language is kind of vague
23 and it kind of looks like it can allow the reviewer to
24 kind of venture unbounded in terms of looking at things.
25 And really RTNSS is about this reliability, availability

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1 mission, you know, and that should be the focus of their
2 review. And we agreed with them and we modified language
3 in a number of places.

4 They did not like the idea that we were
5 basically saying that there was a regulatory basis for
6 invoking tech specs on non-safety systems which was
7 5.036(d). And we disagreed there and said read the
8 regulation. And here's a perfect place for it to be
9 applied.

10 And then lastly, probably one of the most
11 significant comments had to do with the treatment of
12 external events, in particular tornados and hurricanes.
13 And originally the policy said back in the '90s you don't
14 need to worry about tornados, but you need to worry about
15 hurricanes and you should make this stuff be capable of
16 weathering a Category 5 hurricane. Since that time
17 there's been a lot of work done on high winds. We
18 developed two new regulatory guides on how to do high
19 winds and pick wind speeds. And it turns out that
20 hurricanes are not always bounded by tornados under all
21 conditions. So in one sense we felt like that was a
22 little bit of something that we should probably address.

23 And then additionally we felt that, you
24 know, if everybody has to make things weather the
25 Category 5 hurricane for non-safety, there may be some

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1 cases where they're treating their non-safety equipment
2 more rigorously than their safety equipment based on
3 what they're supposed to do, what they're directed to
4 do with the Reg Guide. So we felt that we should key
5 RTNSS back to those NUREG Guides and let them use those
6 as the basis for addressing both tornado and hurricane.

7 So we revised that section and we basically
8 revised, you know, the statements that were in -- the
9 basis for all this was a memorandum from the EDO to the
10 staff clarifying what one of the policy papers said and
11 said this is what you need to do. So we revised that
12 guidance in here. Sent that out for public comment and
13 people were fine with it. I think they realized it was
14 a lot more rational and logical.

15 I think that's pretty much -- let's see.
16 Yes, I think I just covered all that.

17 MEMBER SCHULTZ: Did you cover the last
18 bullet? It says one comment received from NEI. I was
19 just curious what that might have been about.

20 MEMBER BLEY: Was it a 10-page paper?

21 (Laughter.)

22 MR. CARUSO: I think it was why are we doing
23 this now? They may have been the one party that
24 objected. Let's see. Oh, they were saying, oh, if you
25 do it this way -- in other words, if you use these Reg

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1 Guides this could lead to applying GDC 2 to these
2 systems.

3 MEMBER SCHULTZ: Associated with high
4 winds?

5 MR. CARUSO: Yes.

6 MEMBER SCHULTZ: Yes.

7 MR. CARUSO: And we said, no, we don't see
8 that.

9 MEMBER SCHULTZ: Okay.

10 MR. CARUSO: We got rid of the GDC 2 thing.
11 It's very clear what to do here. You can apply it for
12 both non-safety and safety.

13 MEMBER SCHULTZ: That clarifies it for me.
14 Thanks.

15 CHAIRMAN STETKAR: We do need to finish by
16 12:30, and I have about at least 10 minutes of
17 administrative stuff to get through. So we need to get
18 through two chapters in a half an hour. And that's a
19 warning for the members as well as the presenters. So
20 we'd not like to focus, for example, on comments received
21 or purely administrative stuff. That's a hint.

22 MR. CARUSO: Well, let me say one thing: In
23 that regard, you know, these documents basically come
24 pretty much straightaway from documents you've already
25 reviewed and we've been through many times on aircraft

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1 impact and loss of large area. So maybe we should just
2 focus on anything that's different.

3 CHAIRMAN STETKAR: Just walk through your
4 slides, but don't spend a lot of time on purely
5 administrative things. Okay?

6 MR. VETTORI: Yes, sir. SRP 19.4,
7 otherwise known as LOLA, loss of large area.

8 Okay. It's a new SRP. You know that.
9 Currently it's in the concurrence process. It
10 incorporate Interim Staff Guidance-016, which was what
11 was being used before this SRP was written.

12 Who does the reviews? Right now it's a
13 balance of plant, fire protection and one person from
14 the reactor systems. Usually two people do each review.

15 What do we consider conformance? NRC
16 considers conformance with the -- you can read this
17 -- the February 25, 2005 guidance prior to May 26, 2009.
18 But if you go after May 26, 2009 for the COL applicants
19 down at the very bottom it goes to 10 CFR 52.80(d). And
20 there are some exceptions.

21 Okay. Public comments received July 2013.
22 Eleven comments, all from the NEI, very minor in nature,
23 mostly language for clarity.

24 CHAIRMAN STETKAR: Okay. The only thing
25 that I hung up on a little bit in this section was under

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1 the Acceptance Criteria 12 and 18 that talks about
2 training and exercises. And the criteria emphasized
3 -- it says a site tabletop exercise should be conducted
4 prior to initial fuel load. It says it can be conducted
5 on site or off site, but it emphasizes a tabletop
6 exercise. Nowhere do I find any guidance for the
7 performance of an actual drill. There is
8 guidance in the training section. It says as far as the
9 on-site -- I'll call it operational mitigation actions,
10 you know, to provide alternate core cooling or alternate
11 spent fuel pool cooling. It doesn't talk there about
12 periodic classroom training, but it doesn't discuss
13 -- in Appendix B it says, well, there should be
14 walk-throughs of that, but nowhere where I'm mustering
15 external organizations and integrated their response
16 with on-site response, particularly for dealing with now
17 the LOLA event, not necessarily hooking up water, which
18 is a different set of people, does it talk about the
19 actual performance of a drill. It talks about tabletop
20 exercises.

21 I can make anything work in a tabletop
22 exercise. Of course we have the right fittings. Of
23 course we have enough. The keys all work and all of that
24 sort of thing. Have you thought much about that.

25 MR. VETTORI: On the fire brigade side of

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1 that they're supposed to have a yearly drill with the
2 off-site fire department.

3 CHAIRMAN STETKAR: But in particular for a
4 LOLA-type event?

5 MR. VETTORI: It's not specific.

6 CHAIRMAN STETKAR: Okay.

7 MR. VETTORI: It's not specific.

8 CHAIRMAN STETKAR: Okay.

9 MR. CARUSO: Yes, I mean, as I remember it,
10 there is stuff; maybe you'll cover it, walk-throughs to
11 make sure you can get to where you need to get to and
12 how long does it take, you know, stuff like that?

13 CHAIRMAN STETKAR: But that's in the
14 context of -- and the guidance very clearly says that
15 there is a group which must have operational support that
16 is dealing with -- let me call it the explosion-type
17 emergency. Casualties, fires, all that kind -- you
18 know, fuel flowing from one place to the other.
19 There's another group. The operators. And it says
20 they're separate. They have separate radios, for
21 example. They're dealing with how to keep the core cool.
22 Now, they talk to one another because, you know, they
23 need to talk to one another.

24 The guidance for the second group says they
25 need to do walk-throughs. The guidance for the first

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1 group says you can do a tabletop exercise, you know, in
2 a local fire department and that's good enough.

3 MR. CARUSO: Well, are you talking about
4 just what's in the --

5 CHAIRMAN STETKAR: SRP.

6 MR. CARUSO: -- SRP?

7 CHAIRMAN STETKAR: That's right.

8 MR. CARUSO: Because you remember the SRP
9 endorses NEI-06-12 and there's lots of guidance in there
10 about what they're supposed to do.

11 CHAIRMAN STETKAR: Okay.

12 MR. CARUSO: There's command and control
13 guidance.

14 CHAIRMAN STETKAR: There's a lot of
15 guidance. It just never says do I test it with actually
16 people getting into trucks and driving to the site under
17 this type of an event, not just a fire in a wastebasket
18 in the main control room or something like that. And
19 I didn't know whether the normal drills that they do
20 perform annually must at some frequency address a more
21 substantial impact on the site like one of these events.

22 MR. VETTORI: Okay. Each shift is supposed
23 to do four drills a year. You know, I don't know how
24 many shifts are on duty at a nuclear site. One of them
25 is unannounced. And then the yearly drill with the

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1 off-site. So in our guidance for fire protection we
2 don't tell them what they're supposed to drill on, just
3 the fact that they do have these drills.

4 CHAIRMAN STETKAR: Okay.

5 MR. VETTORI: Once a year at least the
6 resident inspector monitors one of the fire drills. Now
7 again, as you said, there's nothing specific on there
8 that says this fire drill we're going to do a LOLA event,
9 so what do we do, you know? Everybody goes to this
10 position, that position, waits for orders.

11 CHAIRMAN STETKAR: Okay.

12 MR. CARUSO: Well, I think, you know,
13 you're right, there were a number of specific activities
14 for training and making sure you could do certain things
15 for LOLA mitigative actions, but there was nothing that
16 talked about, you know, some sort of formal loss of large
17 area event drill. That doesn't exist.

18 CHAIRMAN STETKAR: I was looking --

19 MR. CARUSO: In the future there may.

20 CHAIRMAN STETKAR: -- whether there was
21 something that says, you know, in the annual drills one
22 out of every; pick an arbitrary number, five should
23 address a LOLA-type event rather than a, you know,
24 plain-vanilla-fire-in-a-wastebasket kind of thing.

25 MR. VETTORI: I don't believe so.

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1 CHAIRMAN STETKAR: Okay.

2 MR. VETTORI: I'm going to write that one
3 down. Thank you.

4 CHAIRMAN STETKAR: Thanks.

5 MR. VETTORI: Okay. On to SRP 19.5.
6 Again, that's new. Aircraft Impact. CFR 51.50. It's
7 a new SRP. This one is out. It was dated April 2013.
8 It incorporates Reg Guide 1.217, guidance for the
9 assessment of beyond-design-basis aircraft impacts.
10 Considers conformance with NEI-07-13 Rev 8 as an
11 acceptable method for use in satisfying 50.150.

12 Again, the primary review currently is
13 being done by three different people, one of the fire
14 protection, some from the Division of Engineering under
15 structures and one that does reactor systems. So there
16 are three people that do each of the aircraft impact
17 reviews. One of them is selected just to put the whole
18 SE together.

19 Again, under the public comments. They
20 received them in 2012. There were 10 comments. Two
21 resulted in added text to the SRP. And I have those if
22 you'd like to take a look at them. I thought it would
23 be of interest. Section 3.9 reviewed the design
24 features for core cooling. The text in red is what was
25 added due to this public comment. Basically it says in

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1 most cases operators are expected to have some warning
2 prior to damage so reactor scram would be expected to
3 occur prior to damage. There were some people who
4 thought that the starting part was the reactor was shut
5 down. And the starting point would be the reactor is
6 still operating. You did not have time to shut down.
7 So confirm the design features are in place to protect
8 equipment relied upon for reactor scram.

9 And the other one also in Section 3.9,
10 Features for Core Cooling, was about the use of the
11 borated water. The staff reviewer shall consider the
12 design features credited by the applicant for core
13 cooling, including front line systems and supports
14 systems. As part of core cooling, front line systems,
15 support systems and borated water may be required to
16 maintain the core with sufficient shutdown margin.
17 We added the borated cooling for the PWRs. That was a
18 good catch. It was shutdown margin only.

19 Any questions?

20 CHAIRMAN STETKAR: I had one, and maybe you
21 can help me. And I'm not going to quote all the places
22 I found it. In the review procedures there are many,
23 many paragraphs, and I'll just quote one, that say things
24 like "the staff reviewer should not attempt;" and not
25 is underlined, so it's really emphasized -- should not

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1 attempt to verify whether or not" -- and I'll just call
2 it X right now because it's several different topics
3 -- "satisfy criteria. The adequacy of the design
4 features to fulfill these criteria or functions is
5 subject to staff inspection."

6 So why does the guidance essentially say you
7 as a reviewer should not review the adequacy of whether
8 it's -- there are success criteria in some cases, which
9 is thermal-hydraulic analyses or whatever. There are
10 design features such as is that wall of adequate
11 robustness to prevent penetration? There are operator
12 action criteria, timing and feasibility of operator
13 actions. Why is that removed from the responsibility
14 of the staff reviewer and placed solely in the inspection
15 regime for these issues? And it's throughout the
16 process. I mean, it's that don't do this.

17 MR. VETTORI: They wanted to keep them
18 separate, 100 percent separate.

19 MR. CARUSO: They're not required to submit
20 the information that would allow you to do that because
21 it's all safeguards. That's what's done at the
22 inspection.

23 CHAIRMAN STETKAR: Okay. Okay.

24 MR. CARUSO: You know --

25 CHAIRMAN STETKAR: Yes, I got it. I got it.

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1 Thanks.

2 MR. CARUSO: You know, we can't tell you
3 that that thickness is good enough or --

4 CHAIRMAN STETKAR: I got it. Thank you.
5 That's enough. Thanks. Thanks.

6 And the staff does routinely perform audits
7 and inspections of --

8 MR. VETTORI: Oh, yes, sir.

9 CHAIRMAN STETKAR: -- each step? Thanks.
10 Thank you.

11 MR. VETTORI: The inspection is one week on
12 site at the contractor who did the aircraft impact
13 assessment.

14 CHAIRMAN STETKAR: Great.

15 MR. VETTORI: And they do provide all that
16 information to us.

17 MR. CARUSO: Right. And if that wall is not
18 thick enough, they'll be in violation.

19 CHAIRMAN STETKAR: Thank you. That was
20 easy.

21 Do any of the members have any more
22 questions or comments on 19.5?

23 (No audible response.)

24 CHAIRMAN STETKAR: Okay. If not, we're
25 going to go around the table as we do at the end of every

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1 Subcommittee meeting.

2 First let me get a couple of important
3 administrative things taken care of. Is there anyone
4 in the room who would like to make any comments
5 concerning any of the topics that have been discussed
6 this morning?

7 (No audible response.)

8 CHAIRMAN STETKAR: If not, we're going to
9 get the bridge line open because I know we do have people
10 on the bridge line, so I want to be able to ask whether
11 they have any comments.

12 If someone is out there on the bridge line,
13 I think it's open, but can you do me a favor and just
14 -- anyone who's out there just say something?

15 MR. LEWIS: Hello.

16 CHAIRMAN STETKAR: Okay. Good. We know
17 it's open. Thank you.

18 With that, I will ask is there anyone on the
19 bridge who would like to make a comment?

20 MR. LEWIS: My name is Marvin, M-A-R, V as
21 in Victor, I-N, Lewis, L-E-W-I-S.

22 CHAIRMAN STETKAR: Okay. Mr. Lewis?

23 MR. LEWIS: Yes.

24 CHAIRMAN STETKAR: You have a comment to
25 make?

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1 MR. LEWIS: Well, a comment or a question.
2 I'm not really sure which it's going to wind up.

3 CHAIRMAN STETKAR: Okay. Please --

4 MR. LEWIS: Look, I've been listening and
5 I'm pleased about something, mainly specificity. But
6 I worry about things like it doesn't seem you're really
7 addressing the details that I needed, namely a repair
8 tag block off a warning light, namely --

9 CHAIRMAN STETKAR: Mr. Lewis? Mr. Lewis,
10 if you're using -- either step back from your microphone
11 or pick up a telephone because you're breaking up about
12 every third word and we're having difficulty following
13 you.

14 MR. LEWIS: How about now?

15 CHAIRMAN STETKAR: That is much, much
16 better.

17 MR. LEWIS: Okay. Here's the problem: I
18 don't see you taking the specific site warning tag
19 blocking like a repair tag blocking a site of a warning
20 light, like a technician under orders to put hydrogen
21 in a measuring tank and to fudge the leak rate. And these
22 are the things that have caused a problem in the past,
23 namely Three Mile Island I'm talking about. Chalk River
24 is up in the air. Everybody says, oh, that's a lover's
25 quarrel. Okay. Fine.

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1 But I don't see you addressing these
2 details. In fact, I see just the opposite. You're
3 saying, oh, it's not details. We have to go up a level.
4 I don't agree. I hope you'll answer. If not, my email
5 is marvlewis@juno.com. Over and out.

6 CHAIRMAN STETKAR: Thank you. Thank you
7 very much and we'll take that under consideration very
8 much.

9 Is there anyone else on the bridge line who
10 would like to make a comment?

11 (No audible response.)

12 CHAIRMAN STETKAR: Hearing none, we'll
13 close the bridge line on our end because unfortunately
14 it makes a lot of pops and crackles that we have
15 difficulty dealing with.

16 What I'd like to do now is two things to keep
17 us on track here. Go around the table and get any final
18 comments from any of the members and at the same time
19 ask you do you feel that we should bring, if not all of
20 the sections that we discussed today, at least some of
21 the sections to the Full Committee? So I'm looking for
22 guidance on a Full Committee meeting and any specific
23 final comments you have.

24 And since Mike has the first flight out,
25 I'll start with Mike.

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1 MEMBER CORRADINI: I think staff did a good
2 job of explaining what they've done for the change in
3 the SRP. I do think in view of the broader conversation
4 we had early in the day that it would benefit to have
5 the Full Committee see this so we could discuss it with
6 the Full Committee.

7 CHAIRMAN STETKAR: Thank you. Joy?

8 MEMBER REMPE: I also want to express my
9 appreciation to the staff coming and talking to us about
10 this. I assume that comments that were received today
11 won't receive enough attention unless it goes to the Full
12 Committee. I mean, we heard a lot of, I think, good
13 comments from members and I wasn't sure -- I mean, we
14 heard, oh, we'll take that comment into consideration,
15 is they're drafts. It wasn't clear to me what the next
16 step would be. Will they get issued without -- what's
17 the timing?

18 CHAIRMAN STETKAR: The ACRS communicates
19 formally to the staff and the Commission through our
20 letter reports.

21 MEMBER REMPE: I understand that part, but
22 what is the schedule for them finally being issued? We
23 did not really talk about that.

24 MR. DEGANGE: So, hi, this is Jonathan
25 Degange from the Office of New Reactors.

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1 There's not really a very delineated
2 schedule for each section because they're all kind of
3 in different phases.

4 MEMBER REMPE: Right.

5 MR. DEGANGE: And generally we've gotten
6 ACRS staff comments before that have been considered
7 whenever the guidance was issued as draft for public
8 comment. We took the comments in and they were
9 documented and we made the changes before the guidance
10 was issued as final guidance.

11 That being said, a lot of this guidance is
12 still in concurrence and there's a possibility that we
13 could document the comments we've received here.

14 MEMBER REMPE: But is there a scheduled due
15 date that you are planning to issue them near-term or
16 -- that's what I'm asking for.

17 MR. DEGANGE: Yes.

18 MEMBER REMPE: I understand you shouldn't
19 take comments from individual folks. He was right. It
20 has to come from the Full Committee.

21 MR. DEGANGE: Right.

22 MEMBER REMPE: But is there a due date on
23 when you're planning to issue this?

24 MS. MROWCA: I think some of these have
25 already been issued and some sections are like in final

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1 concurrence, like one more office to say yes before
2 they're actually issued. So we're on the very, very last
3 stages of concurrence.

4 MEMBER REMPE: Okay. And that wasn't clear
5 to me, but maybe I missed that.

6 MS. MROWCA: Yes.

7 MEMBER REMPE: Okay.

8 MS. MROWCA: Even though they've been
9 -- like drafts were issued maybe in late 2012, we're
10 still right now in the final stages of concurrence. And
11 that's why I guess we were saying that -- I mean, it would
12 be hard to take some of the generic or philosophical
13 questions and include them now because then we would have
14 to open up the process again, send it out for public
15 comments and then, you know, go through final NRC
16 concurrence again. So that is hard for us to weigh, you
17 know, the benefit versus the cost of the schedule.

18 MEMBER REMPE: Okay. With that being said,
19 again I tend to agree it would be good to have it come
20 to Full Committee to have a formal letter go out.

21 I know I saw a markup of one of these, was
22 it a year ago?

23 MS. MROWCA: Oh, yes.

24 MEMBER REMPE: And at that time you had
25 asked, you know, is anyone interested in having this come

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1 to ACRS, to a Subcommittee meeting.

2 CHAIRMAN STETKAR: It's taken awhile
3 because of other things that have been on our
4 agenda --

5 MEMBER REMPE: Right.

6 CHAIRMAN STETKAR: -- and other things.
7 It's been on the staff's agenda. It isn't --

8 MEMBER REMPE: I understand that. I just
9 hope that as always -- we always say we wish we could
10 get some of things earlier and impact the process
11 earlier. That's all I have to say.

12 CHAIRMAN STETKAR: Mr. Brown?

13 MEMBER BROWN: Actually this was a
14 productive meeting, even for somebody as ill-versed in
15 PRAs as I am. So I would commend the staff for a
16 relatively crisp discussion and in response to
17 questions. I thought it was helpful.

18 I'm not going to disagree with the other two
19 in terms of bringing it to the Full Committee. I think
20 my comments are more on the execution side of how we
21 should utilize the PRA in terms of design certification
22 as opposed to what's actually the little details within.
23 I think that's the way mine come across, whether anybody
24 else would agree with me or not. But I do think it would
25 be interesting to present this to the Full Committee.

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1 CHAIRMAN STETKAR: Thank you. Dr. Bley?

2 MEMBER BLEY: I, too, appreciated the
3 presentations. I think we ought to take this to the Full
4 Committee, and I think some of the things we discussed
5 are the things that we'd really want to focus on there.

6 CHAIRMAN STETKAR: Steve?

7 MEMBER SCHULTZ: I agree with the comments
8 both in terms of the presentations this morning. I
9 thought they were very informative, well-prepared and
10 did provide a good context for what is being done and
11 what can be done in the future. That's the important
12 feature I'd like to see brought to the Full Committee.

13 CHAIRMAN STETKAR: Ron?

14 MEMBER BALLINGER: And I concur as well. I
15 think we should go to the Full Committee, but I think
16 it would be interesting to make sure that the
17 presentation to the Full Committee went after the
18 comments and didn't focus on the administrative stuff;
19 for example, the adequacy and dominant, those kinds of
20 terms that you're talking about. I think that's what
21 Dennis was suggesting anyway.

22 CHAIRMAN STETKAR: Thanks. And I agree
23 with you. So I think we need to plan for a Full Committee
24 meeting. And I agree; Ron and Steve and Dennis, and I
25 think others have mentioned this, for the Full Committee

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1 I don't think we present, you know, all six sections of
2 the SRP that we discussed this morning and all of the
3 detail. I think we need to get back to you in terms of
4 whether we want to cast it in the context of specific
5 sections of the SRP, which might be easier for you, but
6 to address some of the broader concerns that were
7 discussed this morning. And we'll take that on us to
8 get back to you, but we should get it on our schedule.

9 And again, I don't know whether these issues
10 which tend to be broader and longer term, whether they'll
11 affect your schedule for getting these particular
12 revisions of these sections issued. You know, that's
13 something for you to discuss internally. But I think
14 we should bring it to the Full Committee and we'll work
15 together through John to make that happen.

16 With that, does anyone else have any
17 questions or comments?

18 (No audible response.)

19 CHAIRMAN STETKAR: If not, I'd again like
20 to thank the staff. Thank you very much. We're only
21 about 15 minutes over time. And sorry for the last
22 couple of presenters. I know you probably had a lot more
23 than you wanted to say, but we didn't have nearly as many
24 comments on those sections, so we went a little bit more
25 quickly. Thanks for covering an awful lot of material.

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1 Lynn, you want to say anything else?

2 MS. MROWCA: Yes, I just wanted to say thank
3 you again for your insightful comments. They're always
4 helping in pushing us forward. And I believe that, John.

5 But if you could help us be pretty specific,
6 because I think the kinds of questions and comments that
7 I wrote down are more of the philosophical addressing
8 -- you know, like instead of doing it piecemeal, why
9 don't we take a different approach or -- you know, and
10 explain those kind of things. If you could be very
11 specific in what you want to hear in the Full Committee,
12 I think that would help us both.

13 CHAIRMAN STETKAR: Yes, I mean, and there's
14 a bit of a danger in trying to get too specific because
15 again you're only looking at snapshot comments from
16 individual members and we need to be a little bit careful
17 at the Subcommittee level that we don't so finely focus
18 the Full Committee presentation to essentially, you
19 know, disenfranchise the other members of the Committee
20 who didn't have the benefit from all of these
21 discussions, from hearing a little bit more broader
22 perspective. But you're right, we do owe you a little
23 bit of focus.

24 MS. MROWCA: Okay.

25 CHAIRMAN STETKAR: Okay?

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1 MS. MROWCA: Thank you.

2 CHAIRMAN STETKAR: And with that, we are
3 adjourned.

4 (Whereupon, the meeting was adjourned at
5 2:17 p.m.)

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Revisions to Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants (NUREG-0800)

Staff: Suzanne Schroer, Mark Caruso, Hanh Phan,
Odunayo Ayegbusi, Robert Vettori, Jonathan DeGange

Office of New Reactors

Presented to ACRS Subcommittee on Reliability and PRA

March 20, 2014

Agenda

Section

- SRP Section 17.4
- SRP Section 19.0
- SRP Section 19.1
- SRP Section 19.2
- SRP Section 19.3
- SRP Section 19.4
- SRP Section 19.5

Staff Presenting

Suzanne Schroer
Mark Caruso
Hanh Phan
Odunayo Ayegbusi
Mark Caruso
Robert Vettori
Robert Vettori



Revision 1 to SRP Section 17.4 “Reliability Assurance Program”

SRP 17.4 Update Reliability Assurance Program

- SRP 17.4 updated to incorporate DC/COL-ISG-18 Reliability Assurance Program
 - Sections of 17.4 were wholly replaced by ISG-018
- Also clarified “Review Procedures”

- Sections replaced by DC/COL-ISG-018
 - Review Responsibilities
 - Areas of Review
 - Acceptance Criteria
 - Evaluation Findings
 - References

SRP 17.4 Update Reliability Assurance Program

- Replaced the term “quality elements” in SRP Section 17.4, Revision 0 and “essential elements” in SECY-95-132 with the term “implementation controls” in SRP Section 17.4, Revision 1

- **Additional Review Procedures**
 - Documentation of NRC audits and inspections.
 - Regulatory guides that provide information on categorizing risk significance of systems, structures, and components (SSCs) which can facilitate the review of the methodology for identifying SSCs within the scope of the RAP.
 - Participation of other technical organizations in the review of the list of RAP SSCs and the evaluation methodology.
 - Interfacing with other organizations to review the process for integrating RAP into operational programs.
 - Procedure for reviewing the proposed Tier 1 inspections, tests, analyses, and acceptance criteria for RAP.

SRP 17.4 Update

Public Review and Comment

- 90 day public comment period initiated 10/09/2012
- 42 comments received:
 - Nuclear Energy Institute
 - Jim K. August
- NEI comments were minor; changes in language for clarity requested; most accepted by staff
- August comments concerned plant maintenance programs



Revision 3 to SRP Section 19.0
“Probabilistic Risk Assessment and
Severe Accident Evaluation for New
Reactors”

SRP 19.0 Update

PRA & Severe Accident Evaluation for New Reactors

- SRP 19.0 Updated to incorporate:
 - DC/COL-ISG-03 PRA Info for DC/COL Applications
 - DC/COL-ISG-20 PRA Based Seismic Margins Analysis
 - DI&C-ISG-03 Risk-Informed Digital I&C Review
 - New Reactor Review Experience
 - ESBWR
 - AP1000
 - EPR
 - APWR

SRP 19.0 Update

PRA & Severe Accident Evaluation for New Reactors

- Additional review interfaces identified
 - Structural Engineering
 - Human Factors Engineering
 - External Hazards Review (Chap 2)
 - Digital I&C review
 - Regulatory Treatment of Non-safety Systems
 - Severe Accident Management Alternatives (Environmental Report)

SRP 19.0 Update

New Guidance Based on New Reactor Review Experience

- Review Procedures for PRA Technical Adequacy
 - Conformance with RG 1.200
 - Requirements in PRA Standard not met
 - Peer Review
- Review Procedures Specific to Passive Designs
 - Effect of uncertainty in passive system thermal-hydraulic performance on system success criteria
 - Use of the MAAP code
 - Focused PRA sensitivity studies for RTNSS

SRP 19.0 Update

New Guidance Based on New Reactor Review Experience

- Review Procedures Specific to iPWRs
 - Assure that risk from multi-module events is assessed
 - General guidance for novel shutdown or low power operations
- Level II PRA Results
 - Do confirmatory analysis with MELCOR

SRP 19.0 Update

New Guidance Based on New Reactor Review Experience

- PRA for Non-Power Modes of Operation
 - Assure that key assumptions documented
 - Availability controls for risk-significant SSCs
 - Lessons learned from operating Reactors (e.g., GL-88-17, NUMARC 91-06)
- Treatment of Internal Fire Initiators
 - NUREG/CR-6850 and FIVE are acceptable methods
 - Conservative simplification ok for DC and COL applicant; examples given

SRP 19.0 Update

New Guidance Based on New Reactor Review Experience

- Treatment of High Wind Initiators
 - Guidance for assessing tornado frequencies provided
- Procedures for Specific PRA Audit Topics
 - Digital I&C (DI&C-ISG-03)
- Severe Accident Evaluation
 - Design features address operating reactor vulnerabilities
 - Design features balance prevention and mitigation
 - Containment performance better than current plants
 - Severe Accident Management Design Alternatives (SAMDA) Addressed

SRP 19.0 Update

Public Review and Comment

- 90 day public comment period initiated 10/09/2012
- 22 comments received:
 - Nuclear Energy Institute
 - Ameren (Westinghouse SMR partner)
- Comments were minor; changes in language for clarity requested; most accepted by staff



Revision 3 to SRP Section 19.1
“Determining the Technical Adequacy Of
Probabilistic Risk Assessment for Risk-
informed License Amendment Requests After
Initial Fuel Load”

Revision 3 to SRP Section 19.1

-
- The main purpose of this update is to:
 - incorporate regulatory requirements for new reactors
 - include the applicability of NFPA 805
 - reflect the issuance of Revision 2 to RG 1.200, addenda to the ASME/ANS PRA Standard, and additional PRA-related guidance
 - No new sections or subsections added to the SRP Section 19.1 Revision 3

The title is modified:

- Revision 2

“DETERMINING THE TECHNICAL ADEQUACY OF PROBABILISTIC RISK ASSESSMENT RESULTS FOR RISK-INFORMED ACTIVITIES”

- Revision 3

“DETERMINING THE TECHNICAL ADEQUACY OF PROBABILISTIC RISK ASSESSMENT FOR RISK-INFORMED LICENSE AMENDMENT REQUESTS AFTER INITIAL FUEL LOAD”

SRP 19.1 Rev. 3

Section I. “AREAS OF REVIEW”

- Updated to:
 - ♦ shorten the introductory/history discussion of the ASME and ANS Standards
 - ♦ add the transition to NFPA 805 to subsection “Applicability”

Section II. “ACCEPTANCE CRITERIA”

- Updated to include:
 - Regulatory requirements in 10 CFR 50.71(h)(1), (h)(2), and (h)(3) for new reactors
 - “If the applicant shows that its PRA model meets the regulatory positions set forth in RG 1.200, the technical reviewer should be able to conclude that the PRA is technically adequate. If exceptions to RG 1.200 have been identified and the staff has determined that the exceptions would not affect the risk results sufficiently to affect the regulatory decision, the staff should also be able to conclude that the PRA is technically adequate.”

SRP 19.1 Rev. 3

Section III. “REVIEW PROCEDURES”

- Section III.1.2, “Scope of the PRA Model” updated to include:

“For reactors licensed under Part 52, CFR 50.71(h)(1) requires that each COL holder shall develop a Level 1 and a Level 2 PRA no later than the scheduled date for initial loading of fuel. The PRA must cover those initiating events and modes for which NRC-endorsed consensus standards on PRA exist 1 year prior to the scheduled date for initial fuel load. In addition, 10 CFR 50.71(h)(3) requires that each COL holder shall upgrade the PRA required by 10 CFR 50.71(h)(1) to cover all modes and all initiating events no later than the date on which the licensee submits an application for a renewed license.”

Section III. “REVIEW PROCEDURES” (Continued)

- Section III.2.2, “Assessment of the Technical Adequacy” updated to include:

“The capability category needed for each PRA supporting requirement of the applicable PRA standard technical element is dependent on the application. In general, the staff anticipates that current good practice, i.e., Capability Category II of the ASME/ANS Standard, is the level of detail that is adequate for the majority of applications. However, for some applications, Capability Category I may be sufficient for some PRA supporting requirements, whereas for other applications it may be necessary to achieve Capability Category III for specific PRA supporting requirements.”

- Section IV. “EVALUATION FINDINGS”
 - No major changes
- Section V. “IMPLEMENTATION”
 - No major changes
- Section VI. “REFERENCES” added
 - NEI 05-04, “Process for Performing Follow-On PRA Peer Reviews Using the ASME PRA Standard”
 - NEI 07-12, “Fire Probabilistic Risk Assessment Peer Review Process Guidelines”
 - NUREG-1855, “Guidance on the Treatment of Uncertainties Associated with PRAs in Risk-Informed Decision Making”

SRP 19.1 Rev. 3

Public Review and Comment

- SRP Section 19.1 was posted for 30 days in May 2012 for public comment
- No comments received
- Final issued in September 2012



**Initial Issuance of SRP Section 19.2
“Review of Risk Information Used to
Support Permanent Plant-Specific
Changes to the Licensing Basis:
General Guidance”**

SRP 19.2 Initial Issuance

Review of Risk Information Used to Support Permanent Plant-Specific Changes to the Licensing Basis: General Guidance

- SRP 19.2 content was previously issued as SRP 19, Rev. 1 dated 11/2002
- New SRP 19.0 replaced SRP 19, Rev. 1 as part of Chapter 19 rearrangement (6/2007)
- SRP 19.2 retained previous guidance in SRP 19, Rev. 1 and made minor editorial changes (6/2007)

SRP 19.2 Initial Issuance

Review of Risk Information Used to Support Permanent Plant-Specific Changes to the Licensing Basis: General Guidance

- SRP 19.2 update extended its use to applicants pursuant to 10 CFR 52, as appropriate



SRP Section 19.3 (NEW)
**“Regulatory Treatment of Non-Safety
Systems for Passive Advanced Light
Water Reactors”**

SRP 19.3

Regulatory Treatment of Non-Safety Systems (RTNSS)

- Overview

- SRP 19.3 is a new section that addresses Regulatory Treatment of Non-Safety Systems for passive designs
- SRP 19.3 is based on Commission policy described in SECY papers and SRMs for AP600/1000 reviews
- SRP 19.3 provides top level guidance; SRPs that address specific SSCs provide additional detailed guidance
- Review responsibility is spread widely over the technical staff

SRP 19.3

Regulatory Treatment of Non-Safety Systems

- Areas of Review
 - Selection of RTNSS SSCs using the five RTNSS scoping criteria
 - Functional design of RTNSS SSCs
 - Adequacy of functional design requirements
 - Compliance with functional design requirements
 - Design improvements to minimize adverse interaction between passive safety systems and non-safety active systems
 - Focused PRA sensitivity studies
 - Augmented design standards for RTNSS “B” SSCs
 - Regulatory treatment of RTNSS SSCs

SRP 19.3

Regulatory Treatment of Non-Safety Systems

- **Acceptance Criteria**

- RTNSS SSC selection criteria have been met
- Functional design requirements adequate
- RTNSS SSCs meet their functional design requirements
- Adverse interaction between passive safety systems and active non-safety back-up systems identified and removed through design
- Focused PRA sensitivity studies are adequate
- Proposed regulatory treatment of each SSC is commensurate with its reliability/availability mission
- Controls for RTNSS “B” SSCs are provided in the Availability Controls Manual.
- Tech Spec established for highly risk-significant RTNSS SSCs

SRP 19.3

Public Review and Comment

- 90 day public comment period initiated 10/12/2012
- 64 comments received from 4 organizations and one private citizen
- Key topics in comments:
 - Expectations for RTNSS “B” SSCs
 - Design review – focus should be on reliability/availability mission
 - Protection of RTNSS SSCs from External Hazards
 - Regulatory basis for Technical Specifications

SRP 19.3

Public Review and Comment

- Public meeting in January 2013 to discuss staff's review of comments
- SRP revised to address comments
- SRP re-noticed in July 2013 for public comment on single new staff position not reflected in original noticed version (selection of wind speeds)
- One comment received from NEI



SRP Section 19.4 (NEW)
**“Strategies and Guidance to Address Loss
of Large Areas of the Plant Due to
Explosions and Fires”**

Standard Review Plan 19.4

- New SRP – in the concurrence process
- Incorporates DC/COL-ISG-016
- Review conducted by
 - Organization responsible for the review of mitigating strategies
 - Organization responsible for the review of reactor systems

Standard Review Plan 19.4

- The NRC staff considers conformance with the February 25, 2005, guidance, TI 2515/168, and NEI 06-12 “B.5.b Phase 2 & 3 Submittal Guideline,” Revision 2, acceptable for use by holders of a construction permit or a license to operate a power reactor facility issued under 10 CFR Part 50 prior to May 26, 2009, in satisfying the Commission’s requirements in 10 CFR 50.54(hh)(2) and 10 CFR 50.34(i).
- The NRC staff considers conformance with the February 25, 2005, guidance, TI 2515/168, and NEI 06-12, Revision 3, acceptable for use by applicants for a 10 CFR Part 52 COL or a 10 CFR Part 50 operating license, in satisfying the Commission’s requirements in 10 CFR 50.54(hh)(2), 10 CFR 50.34(i), and 10 CFR 52.80(d), with some exceptions.

- Public comments received July 2013
 - 11 Comments
 - Nuclear Energy Institute
 - Minor; changes in language for clarity



SRP Section 19.5 (NEW)

“Adequacy of Design Features and Functional Capabilities Identified and Described for Withstanding Aircraft Impacts”

Standard Review Plan 19.5

- New SRP - dated April 2013
- Incorporates Reg Guide 1.217, Rev 0, “Guidance for the Assessment of Beyond-Design-Basis Aircraft Impacts”
- Considers conformance with Nuclear Energy Institute (NEI) 07-13, Revision 8, “Methodology for Performing Aircraft Impact Assessments for New Plant Designs,” an acceptable method for use in satisfying the NRC requirements in 10 CFR 50.150(a).

Standard Review Plan 19.5

- Primary aircraft impact assessment review is conducted by three different branches
 - Organization responsible for the review of fire protection
 - Organization responsible for the review of structures
 - Organization responsible for the review of reactor systems

- Public comments received August 2012
- 10 Comments
 - Erin Engineering
 - KEPCO E&C
 - One individual
- Two resulted in added text to the SRP

Standard Review Plan 19.5

- Section 3.9 Review of Design Features for Core Cooling
 - “In most cases, operators are expected to have some warning prior to damage so a reactor scram would be expected to occur prior to damage. However, in other cases, damage could impair the ability of the reactor to scram. An assessment will be made of the potential for damage to prevent a scram should it have not previously occurred. The Staff reviewer shall initiate a review to confirm that design features are in place to protect equipment relied upon for reactor scram.”

- Section 3.9 Review of Design Features for Core Cooling
 - “The Staff reviewer shall consider the design features credited by the applicant for core cooling, including front line systems and support systems. As part of core cooling, front line systems, support systems, and borated water may be required to maintain the core with sufficient shutdown margin.”

ACRONYMS

- ANS - American Nuclear Society
- ASME - American Society of Mechanical Engineers
- CFR - Code of Federal Regulations
- COL - Combined License
- DC - Design Certification
- I&C - Instrumentation and Control
- ISG - Interim Staff Guidance
- NEI - Nuclear Energy Institute
- NFPA - National Fire Protection Association
- PRA - Probabilistic Risk Assessment
- RAP - Reliability Assurance Program
- RG - Regulatory Guide
- RTNSS - Regulatory Treatment of Non-Safety Systems
- SAMDA - Severe Accident Management Design Alternatives
- SRP - Standard Review Plan
- SSC - Structures, Systems and Components