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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

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 NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

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PLANT OPERATIONS AND FIRE PROTECTION SUBCOMMITTEE

+ + + + +

WEDNESDAY

SEPTEMBER 20, 2017

+ + + + +

ROCKVILLE, MARYLAND

+ + + + +

The Subcommittee met at the Nuclear
 Regulatory Commission, Two White Flint North, Room
 T2B1, 11545 Rockville Pike, at 12:59 p.m., Gordon R.
 Skillman, Chairman, presiding.

COMMITTEE MEMBERS:

GORDON R. SKILLMAN, Chairman

RONALD G. BALLINGER, Member

DENNIS C. BLEY, Member

WALTER L. KIRCHNER, Member

DANA A. POWERS, Member

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HAROLD B. RAY, Member*

JOY REMPE, Member

JOHN W. STETKAR, Chairman

MATTHEW W. SUNSERI, Member

DESIGNATED FEDERAL OFFICIAL:

QUYNH NGUYEN

ALSO PRESENT:

ODENAYO AYEBUSI, NRO

STEVE CAMPBELL, NRR

CHRIS CAUFFMAN, NRR

RUSSELL GIBBS, NRR

MICHELLE HAYES, NRR

MATT LEECH, NRR

DANIEL MERZKE, NRR

CHRISTOPHER MILLER, NRR

JEFFREY MITMAN, NRR

ANDREA D. VEIL, Executive Director, ACRS

SEE-MENG WONG, NRR

*Present via telephone

T-A-B-L-E O-F C-O-N-T-E-N-T-S

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P R O C E E D I N G S

12:59 p.m.

CHAIRMAN SKILLMAN: This meeting will come to order. This is a meeting of the Plant Operations and Fire Protection Subcommittee of the Advisory Committee on Reactor Safeguards.

I'm Gordon Skillman, Chairman of the Subcommittee. ACRS Members in the room are Ronald Ballinger, Matt Sunseri, Dana Powers, Joy Rempe, Dennis Bley, Walter Kirchner, and we anticipate we will have John Stetkar.

We also have Harold Ray participating by the bridge line. Quynh Nguyen of the ACRS Staff is the designated federal official for this meeting.

The Subcommittee will hear Staff presentations on the proposed update of the Reactor Oversight program in regards to new reactors.

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 ACRS was established by a statute and is governed by the Federal Advisory Committee Act. This means that the Committee can only speak through its published letter reports.

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1 We hold meetings to gather information to
2 support our deliberations. Interested parties who
3 wish to provide comments can contact our Offices
4 requesting time after the meeting announcement is
5 published in the Federal Register.

6 That said, we also set aside time for
7 spur-of-the-moment comments from members of the public
8 attending or listening in. Written comments are also
9 welcome.

10 The ACRS Section of the U.S. NRC public
11 website provides our charter, bylaws, letter reports,
12 and full transcripts, of all full and Subcommittee
13 meetings, including slides presented at the meeting.

14 The rules for participation in today's
15 meeting were previously announced in the Federal
16 Register. We have received no written comments or
17 requests for time to make oral statements from members
18 of the public regarding today's meeting.

19 We have a bridge line established for
20 interested members of the public to listen in. To
21 preclude interruption of the meeting, the phone bridge
22 line will be placed in a listen-in mode during the
23 presentations and Committee discussions.

24 We will unmute that bridge line at a
25 designated time to afford the public an opportunity to

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1 make a statement or provide comments.

2 At this time, I request the meeting
3 attendees and participants please silence your cell
4 phones and any other electronic devices that are
5 audible.

6 A transcript of the meeting is being kept
7 and will be made available as stated in the Federal
8 Register Notice.

9 Therefore, we request that participants in
10 this meeting please use the microphones located
11 throughout the Meeting Room when addressing the
12 Subcommittee.

13 The participants should first identify
14 themselves and speak with sufficient clarity and
15 volume so that they may be readily heard.

16 Make sure that the green light of the
17 microphone is on before speaking, and please turn that
18 green light off when not in use.

19 We will now proceed with the meeting and I
20 call on Chris Miller, Director of Inspection and
21 original support of the NRC Staff, to begin. Chris?

22 MR. MILLER: Thank you, Chairman Skillman,
23 and Members of the ACRS.

24 First of all, we just appreciate your
25 time and the look that you're going to be giving to

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1 this program as we're modifying the Reactor Oversight
2 Process to accommodate new reactors.

3 The Staff values your insights in the
4 discussion that we have about our progress so far. Of
5 course, this has been a multi-year effort involving
6 stakeholders, internal and external, and a number of
7 public meetings.

8 And to be frank, we have a few more years
9 before we'll be putting this version of the ROP into
10 practice. So, we have some time to make some tweaks.
11 So, this is a good time to be discussing this process.

12 While the paper and the recommendations
13 the Staff developed to modify the ROP focused mainly
14 on AP1000, we do think that we have a model that can
15 be applied to any of the Advanced Reactor Series. So,
16 we could use this as we go forward for other designs.

17 The Staff has concluded that only modest
18 changes to the ROP should be necessary to ensure
19 adequate oversight of new reactor designs which have a
20 much lower baseline core damage frequency.

21 In developing the recommended changes,
22 Staff ensured that we followed Commission direction in
23 maintaining the existing ROP framework and existing
24 risk goals, and the guidance associated.

25 The Commission affirmed in SRM for SECY-

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1 10-0121 that at a minimum, new-generation reactors
2 afford at least the same degree of protection of the
3 public, and the environment that is required for
4 current-generation light water reactors.

5 But since these reactors have enhanced
6 margins and safety features, we think the program
7 could perhaps allow for more flexibilities. And we'll
8 be discussing some of those.

9 And finally, we note that the ROP is a
10 living process. We continuously assess the
11 effectiveness of the ROP and the changes to the ROP,
12 and modify when necessary.

13 We fully expect when the new reactor
14 designs come online, the Staff will evaluate the
15 operating experience and recommend adjustments as part
16 of the annual ROP self-assessment process.

17 So, again, we look forward to your
18 insights and a healthy discussion. I'd like to turn
19 the meeting over to Dan Merzke.

20 MR. MERZKE: Thank you, Chris. Good
21 afternoon, my name's Dan Merzke. I'm from the Office
22 of Nuclear Reactor Regulation, NRR.

23 I'm the current project lead for
24 developing recommendations to modify the Reactor
25 Oversight Process, or henceforth the ROP, to ensure

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1 appropriate oversight of new reactor designs, as the
2 current project lead because I took over the project
3 from Ron Frahm, who some of you may have worked with
4 in the past.

5 And he took early retirement and bagged me
6 with it. I'd like to thank the Committee for meeting
7 with the Staff today to hear --

8 MEMBER POWERS: Is early retirement an
9 occupational hazard here?

10 MR. MERZKE: He left with a smile on his
11 face.

12 Again, I want to thank the Committee for
13 meeting with Staff to hear your recommendations -- to
14 hear our recommendations and share any insights you
15 have that might contribute to informer file
16 recommendations that we'll be sending to the
17 Commission by the end of the year.

18 With me today are the leads for the
19 individual ROP program areas, who will be also
20 presenting tonight, or today.

21 Immediately to my right is Ayo Ayegbusi,
22 from the Office of New Reactors, not nuclear reactor
23 regulation. But he'll be discussing performance
24 indicators.

25 I would like to note that Ayo is not the

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1 PI Program Lead for NRR. The gentleman who did most
2 of the legwork on this effort was recently transferred
3 to Three Mile Island as a Senior Resident Inspector or
4 so.

5 He said he's too busy into an outage this
6 week to participate, so Ayo graciously stepped up the
7 plate and helped us out here. So, I thank him.

8 MR. MILLER: And he also went with a smile
9 on his face.

10 MR. MERZKE: Yes, he did.

11 CHAIRMAN SKILLMAN: I will note in
12 advancing that the TMI shutdown went with some
13 fanfare; what's being advertised is this might be the
14 last of the last. That's correct?

15 And it came down over the weekend. I
16 think it came down either Friday night or Saturday
17 night.

18 But the Harrisburg community is watching
19 what is happened at Three Mile Island very closely
20 because of employment and also industry interest.

21 A lot of people after the accident became
22 quite interested in what was happening in Middletown.

23 So, what's going to happen in this month
24 and then in the two years that follow may have some
25 national significance in terms of preserving one nuke,

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1 a merchant nuke.

2 MR. MERZKE: And he may be back with us in
3 a couple years after they shut down.

4 (Laughter.)

5 Also, to my right is Steve Campbell from
6 NRR, who will be discussing the Baseline Inspection
7 Program changes.

8 And Russell Gibbs, See-Meng Wong, and Matt
9 Leech, all from NRR, will be discussing the plan
10 changes for the Significance Determination Process.

11 Last month, the Staff delivered a white
12 paper to the ACRS with the Staff's conclusions and
13 recommendations, modifying the ROP for new reactors.

14 Members may have noticed that the white
15 paper focuses mainly on the Westinghouse AP1000
16 reactor design, and does not acknowledge other new
17 reactor designs.

18 The Staff review deliberately focused on
19 AP1000 because those are the only units that are
20 currently under construction.

21 And after recent developments, we thought
22 maybe this was just going to be an academic exercise
23 after all. But Vogtle continues, so we'll see.

24 But the review process that we put in
25 place for this effort, all those processes, the GAP

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1 analyses we did to determine what was missing and what
2 needed to be addressed for the ROP to support these
3 new reactor designs.

4 That process will be easily transferrable
5 to any of the new reactor designs.

6 MEMBER POWERS: What kind of lead time
7 before operation do you think you would need?

8 I mean, you clearly don't know, but do you
9 think you would need to set up an ROP for something
10 like a new scale design?

11 MR. MERZKE: Well, I don't think the Gap
12 analyses that was conducted for the various programs,
13 the programs under PIs, based on inspection and STP, I
14 don't think would take much more of a year of effort
15 to go through that Gap analysis again, based on --

16 MEMBER POWERS: But through the
17 Significance Determination Process, you'd need a PRA,
18 and I mean it clearly takes some time.

19 MR. MERZKE: Yes, we're not done with the
20 Significance Determination Process either. We know
21 what we need to do, what changes need to be made.

22 We actually have put pen to paper over the
23 next year and actually identified the specifics as to
24 ensuring we've got the right words down.

25 So, there's still work to be done in those

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1 areas. But at this point, we just know what we need
2 to do with each of the STPs.

3 MEMBER POWERS: I mean just as a true way
4 would be two years?

5 MR. MERZKE: That would be a good guess.
6 Thus, we concluded the ROP is robust and flexible
7 enough to provide adequate oversight of the AP1000
8 with just relatively modest provisions.

9 Moving on, the purpose of today's meeting
10 is to discuss the Staff's evaluations, conclusions,
11 and recommendations, as noted in the white paper, to
12 modify the ROP for new reactors.

13 And this is in response to the Staff
14 Requirements Memorandum on SECY-13-0137, which we'll
15 talk about in the background.

16 For an agenda, I will be discussing the
17 background and overview of the ROP, and I will give a
18 brief tutorial of the ROP for those folks who might be
19 attending that are not very familiar with the ROPP.

20 I'll turn it over to Ayo, who will discuss
21 the performance indicators and thresholds. And then
22 Steve Campbell will discuss the baseline inspection
23 program changes.

24 And Russell, See-Meng, and Matt, will
25 discuss the Significance Determination Process issues

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1 that need to be addressed.

2 And I'll wrap up with conclusions and
3 recommendations that we've developed in the white
4 paper and the steps we're going to be taking
5 following.

6 How did we get here? The baseline risk
7 estimates for most new reactor designs are
8 significantly lower than those for current-design
9 power pressurized water reactors and boiling water
10 reactors.

11 Back when the Staff recognized the new
12 designs were going to have significantly lower
13 baseline pro-damage frequencies, there were some
14 questions raised as to whether the correct guidance,
15 risk-informed guidance, for licensing changes in
16 reactor oversight would be sufficient to address these
17 new reactor designs.

18 So, in the past several years, Staff has
19 corresponded with the Commission and the ACRS to
20 address Staff's recommendations for developing or
21 modifying risk-informed guidance and the oversight
22 process for new light water reactor applications.

23 MEMBER STETKAR: Dan?

24 MR. MERZKE: Yes?

25 MEMBER STETKAR: I don't know when it's

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1 appropriate to ask this, but tell me if you're going
2 to address it later.

3 But you said that the baseline risk
4 estimates for new reactors are, you used the term,
5 much lower, you just used the term lower here, than
6 currently-operating reactors.

7 And you used that argument in several of
8 the papers that I've read about concerns about
9 specific metrics and things like that.

10 The current ROP measures things against
11 the core damage frequency from internal events during
12 power operations. Is that correct?

13 MR. MERZKE: Yes, sir, in general, yes.

14 MEMBER STETKAR: Okay, well, one might
15 find that for new reactors, it's more important to
16 consider all hazards and all modes of operation.

17 Because for example, systems like service
18 water systems and complement cooling water systems,
19 that you note are not important at all for the AP1000
20 in the way they measure importance during shutdown
21 modes, are really, really important during shutdown
22 modes.

23 And one might find that the risk during
24 shutdown is comparable to or greater than the risk
25 during power operation, if one actually had a shutdown

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1 risk assessment, which they don't.

2 And one might find that the important of
3 some systems and components to large release frequency
4 or large early release frequency is much more
5 important than it is to core damage frequency.

6 So, how does the Reactor Oversight Process
7 capture those elements of whether you want to call it
8 plant safety or plant risk or what attributes you
9 want to give to those things?

10 Simply because you're looking at one small
11 chunk of risk and saying that somebody's calculation
12 of that small chunk is smaller than somebody else's
13 calculation of the small chunk for a currently-
14 operating reactor.

15 MR. GIBBS: So, Dan, may I?

16 MR. MERZKE: Yes, go ahead.

17 MR. GIBBS: So, the first thing we want to
18 point out is the current STP and the ROP looks at all
19 modes of operations, not just power operation. That's
20 the first point.

21 And we have our Staff from our Division of
22 Risk Assessment here, who is actually our shutdown
23 specialist in covering shutdown and, actually, low
24 power. So, that's important to acknowledge that.

25 So, then the second point is that we have

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1 many, many tools to address all the aspects of the
2 current operating fleet, and we're going to be looking
3 at the tools for new reactors.

4 Now, we believe the current ROP, STP, is
5 robust, as Dan indicated earlier. That would address
6 operational aspects of new reactors as well.

7 And we're going to talk through that sum
8 today about what we believe needs to change, and what
9 we believe does not need to be changed.

10 And so, also, I wanted to share with you,
11 when we do an analysis, particularly those that are
12 more we'll call them risk-informed or more based on
13 probabilistic risk assessment, we're looking at more
14 than the internal events' analysis.

15 We're also looking at external hazards.
16 We're looking at large early release frequency.

17 So, each of the inspection findings that
18 we examined for significance that are not screen to
19 green, or very low safety significance, we are looking
20 at all those other aspects of risk, not just the
21 internal events' analysis.

22 I just wanted to make sure we were very
23 clear about that.

24 MEMBER STETKAR: Okay, well I'll wait
25 until later in the discussion because I'm more

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1 concerned about --

2 CHAIRMAN SKILLMAN: I'd like to build on
3 John's question if I could, please? So much of what
4 we've experienced for the past couple decades on ROP
5 has been focused on SSCs, structures, systems, and
6 components.

7 We know if an RHR pump is operable or not
8 operable, operable but degraded. We know how to make
9 operability calls. We know how to exigent-request
10 those types of things.

11 But let me propose a situation to you, and
12 ask you how the ROP is going to review it? We've got
13 an up-and-running AP1000. It's maybe on a 24-month
14 field cycle.

15 It's out 21 months, 100 percent power, not
16 a blip. And it gets a retroactive bump lubricating
17 oil fire, and so they file their text specs, they go
18 into either reduced power shutdown.

19 But that fire has coated the inside of
20 that containment with something.

21 It's going to be debris, it's going to be
22 organic debris, and I would offer, having been part of
23 a couple fires, I now have a degraded thermal
24 condition to the wall of that containment.

25 But it depends on that thermal

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1 conductivity for my emergency core cooling system.

2 How do you consider obscure, passive,
3 physical characteristics as part of your consideration
4 for inspection and for significance determination,
5 when you look at the review of an event like that, and
6 particularly, the question of continuing to operate?

7 MR. GIBBS: All right, so if I may, why
8 don't we address the inspection piece of that first,
9 because that's, if you will, the flow of our program?
10 We inspect and then if there's a problem, we
11 determine significance.

12 So, Steve, did you want to comment about
13 what we're doing in this inspection side with respect
14 to specifically passive components?

15 Because I will tell you, from a risk-
16 assessment, and this is a very general statement, you
17 know, we have said these new reactors are safer.
18 Well, one of the main reasons they're safer is because
19 they have passive components.

20 And so from an STP perspective, what I
21 sort of anticipate, if you will, is we need to ensure
22 these passive components are performing their
23 function.

24 And if they are not, then those types of
25 inspection findings could, indeed, be very risk-

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1 significant. So, I'm agreeing with you in that
2 regard.

3 CHAIRMAN SKILLMAN: Building on John's
4 comment --

5 MR. GIBBS: And it's a matter of how we go
6 about assessing significance.

7 CHAIRMAN SKILLMAN: What I'm suggesting is
8 that there can be some extremely subtle conditions
9 that present themselves to the plant, that really
10 present a risk or a hazard that we've never had to
11 deal with before because we've always depended on big,
12 heavy, well-designed components, pumps, valves, heat-
13 exchangers, fans, blowers.

14 And now we're depending upon a film
15 coefficient or a column height for natural circulation
16 to ensure that we are going to get the decay heat
17 removal, or whatever else it is, upon which we are
18 depending.

19 How are those physical phenomena
20 addressed?

21 MR. MERZKE: I'll just go ahead and pick
22 it up from there, Russell. This is what we would term
23 an event at a plant.

24 Okay, and after an event occurs, the
25 regional management will be directed to 8.3 and

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1 they'll go through the requirements of evacuating to
2 determine if a reactive inspection is warranted.

3 In a case like what you're talking about
4 with the reactor coolant pump fire, I would suggest
5 that the core damage frequency, or conditional core
6 damage probability I think is what they used for
7 Management Directive 8.3, would be sufficient to at
8 least launch a special inspection, at the very least.

9 So, we'll be sending a team of inspectors
10 there to evaluate the events and the licensee's root
11 cause and corrective actions.

12 In part, those corrective actions would be
13 to expect them to do an analysis or something to fix
14 the containment.

15 Would somebody recognize the fact that
16 there's a film buildup on the inside of containment?
17 That's a good question. How good are our inspectors?
18 I have to rely on their knowledge and skills.

19 Most of our inspectors probably are going
20 to be coming from other reactor plants. We probably
21 won't be getting any new inspectors sending out to the
22 AP1000. They'll have experience in other PWR
23 applications, I expect.

24 But a lot of that, those insights, will
25 have to be -- hopefully, the licensee will catch, if

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1 not, the inspectors will catch.

2 But those are two levels of eyes who are
3 hopefully going to catch an issue like that where we
4 don't miss it, and expect corrective actions to be
5 taken by the licensee before we allow them to restart.

6 MEMBER BLEY: Let me get a comment on the
7 writing that I'd like to place there. Number one, as
8 of right now, we don't have any, the Staff doesn't
9 have any, SPAR models for these new plants.

10 And the PRAs for them by the vendors
11 aren't the complete PRAs that need to be there before
12 fuel load. For every, I think every design cert, at
13 least in the last ten years, that's come up.

14 We've put a comment in the record that the
15 PRAs, as the State re-saw them as they went through
16 the design cert, had not really looked at these
17 passive features for things that could degrade them.

18 So, if we have the PRAs that exist now and
19 you had SPAR models as they would exist now if they
20 were based on those, and if you had a finding that we
21 had a fire that surfaced and they went to the PRA,
22 they'd say, well, there's nowhere to put this in so
23 there's problem.

24 So, between now and whenever this goes
25 into place, those risk assessments need to be upgraded

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1 to the point that you could address these issues. The
2 issues aren't simple or subtle but they're knowable,
3 and they really need to get factored in.

4 So, that's not something that you guys are
5 doing right now but I think everybody needs to stay
6 aware of that.

7 MR. MERZKE: Yes, sir. Thank you, it's
8 noted.

9 CHAIRMAN SKILLMAN: Please proceed.

10 MR. MERZKE: Thank you. And I guess we'll
11 go onto the next slide.

12 Quickly going over the background of how
13 we got here, the first paper that the Staff submitted
14 was back in 2010, the SECY-10-021, modifying the risk-
15 informed regulatory guidance for new reactors.

16 The Staff provided the Commission options
17 to modify the risk-informed regulatory guidance for
18 new reactors.

19 And that included options for modifying
20 the Reactor Oversight Process to adjust for the lower
21 baseline core damage frequency of these new designs.

22 The Staff recommended in that paper
23 working with stakeholders to identify and implement
24 appropriate changes to the existing risk-informed
25 guidance, because of those lower baseline risk

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1 frequencies.

2 In the SRM, the Commission disapproved the
3 Staff's recommendations and reaffirmed that the
4 existing safety goals, safety performance
5 expectations, subsidiary risk goals, and associated
6 risk guidance, key principles of quantitative metrics
7 for implementing risk-informed decision-making, are
8 sufficient for these new plants.

9 I quote that because this Staff hangs its
10 hat on those words and maintaining the risk thresholds
11 that the current ROP possesses.

12 In a subsequent paper to the Commission,
13 SECY-12-0081, Risk-Informed Regulatory Framework for
14 New Reactors, the Staff provided additional
15 recommendations on both licensing and oversight
16 processes.

17 Staff recommended the development of
18 quantitative risk insights, originally termed
19 deterministic backstops, to supplement the
20 probabilistic risk assessment information to determine
21 significance of inspection findings.

22 In that SRM, the Commission also
23 disapproved the Staff's recommendation and directed
24 the Staff to consider using relevant note risk
25 metrics, in order to provide a technical basis for why

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1 this option was not viable.

2 I believe the relative risk metric was an
3 idea provided in our letter from the ACRS at the time.
4 And the Staff subsequently did an evaluation of those
5 risk metrics in the following SECY paper, Relative
6 Risk, SECY-13-0137, Recommendations for Risk-Informing
7 the Reactor Oversight Process for New Reactors.

8 In that paper, the Staff developed a
9 technical basis for the proposal to use qualitative
10 considerations for characterizing the significance of
11 inspection findings.

12 The Staff also performed a technical
13 evaluation of the use of relative risk measures for
14 characterizing the significance of inspection
15 findings. In that paper, the Staff recommended
16 against using relative risk metrics.

17 And I would also note that the ACRS
18 disagreed with the Staff's evaluation at that time,
19 and the Commission did not press the Staff in its SRM
20 to continue efforts in that area.

21 Also in that paper, the Staff evaluated
22 the appropriateness of the existing performance
23 indicators and the related thresholds for new
24 reactors.

25 MEMBER REMPE: So, remind me, because I'm

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1 older and forgetting things, but I do recall another
2 example where the Staff and industry worked together
3 with qualitative considerations or factors, and they
4 set a path to use them.

5 And at the end, industry said, well, we
6 don't want to do something because of a qualitative
7 consideration and things just kind of didn't work out
8 at that point.

9 And what is the industry interaction with
10 using something that's qualitative?

11 And what assurances do you have that if
12 you determine something was significant, based on a
13 qualitative consideration, that industry might not do
14 the same thing?

15 MR. MERZKE: Industry has been opposed to
16 the additional use of qualitative factors in
17 determining significance of anything.

18 MEMBER REMPE: Right.

19 MR. MERZKE: So, the Commission has also
20 weighed in on this area and seems opposed to the Staff
21 taking further measures and using qualitative insights
22 in using risk-informing our guidance.

23 So, we're taking a cue from them and we're
24 not pushing that for the recommended changed to the
25 ROP. However, there's still the Appendix M to IMCO-

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1 609, STP 609, which is the STP which uses qualitative
2 measures, which we'll be discussing later on in this
3 briefing.

4 That is being reviewed right now for
5 potential revision, but if that revision goes forward,
6 it will be going to the Commission for approval.

7 So, the Commission will weigh in at that
8 time as to whether or not the Staff is off base with
9 the use of qualitative measures in determining
10 significance.

11 MEMBER REMPE: Okay, but again, you know
12 industry doesn't like using qualitative considerations
13 but you're still, as a Staff Member, pursuing that, is
14 kind of where I was at.

15 I was reading this material to prepare for
16 this meeting and --

17 MR. MERZKE: Well, 609 Appendix M is kind
18 of like a last resort. We use it because there are
19 such large uncertainties in the assumptions made in
20 developing a significance determination that it could
21 go anywhere from green to red.

22 So, we need to start looking at other
23 factors to zero in on what really is the significance
24 of that issue.

25 MEMBER REMPE: But when push comes to

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1 shove, industry will probably come back and say, no,
2 it's qualitative. Right?

3 MR. MERZKE: Not really. We've used
4 Appendix M in several cases.

5 In most cases, for flooding analyses where
6 several white findings were assigned using Appendix M.

7 MEMBER REMPE: And they didn't protest it?

8 MR. MERZKE: And they did not protest
9 those, no.

10 MEMBER REMPE: Okie-doke, thank you.

11 MR. MERZKE: Sure.

12 MR. GIBBS: Dan, may I? Just one comment
13 just for clarity, and thank you for that question.
14 We're going to speak to that more as we get into the
15 Significance Determination Process.

16 But the Commission, based on their Staff
17 Requirements Memorandum, clearly indicated that they
18 want us, the Staff, to continue using quantitative
19 approaches, to emphasize quantitative approaches, and
20 acknowledge that. And we will do that when it's
21 appropriate.

22 But the Commission also in the same SRM
23 said to develop a qualitative framework for certain
24 aspects of new reactors.

25 And they also said to improve in the

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1 clarity on the use of qualitative factors for the
2 current operating fleet.

3 So, I just want to be clear that the
4 Commission does acknowledge that qualitative framework
5 is needed on occasion, when the quantitative
6 approaches are not, if you will, productive or
7 fruitful in the Significance Determination Process.
8 We'll speak more to that in just a moment.

9 MEMBER KIRCHNER: Mr. Chairman, can I risk
10 a digression here? Could you elaborate on your second
11 bullet here? Not being part of the
12 ACRS until recently, what are you really saying here
13 about recommending against using relative risk
14 measures?

15 MR. MERZKE: Currently the Significance
16 Determination Process uses absolute values for the
17 change in core damage frequency to trigger thresholds
18 for significance.

19 MEMBER KIRCHNER: I'm presuming you didn't
20 qualify what new reactors are, so I'm assuming you're
21 trying to come up with a technology-neutral revision
22 to the ROP?

23 MR. MERZKE: One of the considerations was
24 if we did go to relative risk metrics, that we would
25 have to apply them to the entire operating fleet, not

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1 just new reactors.

2 It was going to be a challenge.

3 MEMBER KIRCHNER: But for new reactors
4 that are by and large -- as it was pointed out
5 earlier, until they're much further along in the
6 design certification stage or almost ready to load
7 fuel, your PRAs are based on paper reactor designs for
8 non-LWR technology.

9 So, wouldn't you want to look at relative
10 risk metrics there, where you might have absolute
11 values for core disruption frequency or large release
12 that are 10 to the -7 or less.

13 MR. MERZKE: That's a good question.

14 MEMBER KIRCHNER: The certainty band on
15 the 10 to the -7 might be several orders of magnitude
16 until the design is mature.

17 MR. MERZKE: I will say that the ROP
18 provides opportunities for the Staff to exercise
19 additional regulatory action when we think it's
20 necessary in the instance of an ROP deviation.

21 So, if were to look at an inspection
22 finding that in today's ROP would be classified as
23 green or one of these new reactor designs because,
24 let's just throw out a number there, the delta CDF was
25 calculated at 2E to the -7th, which in today's

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1 environment would be green.

2 But it might be double the magnitude of
3 what the baseline core damage frequency is for the
4 AP1000. In this case, I think that's pretty close.

5 Is that significant? Yes, some folks
6 would say that might be significant.

7 Do we have an option of doing anything in
8 addition to just assigning a green finding, and
9 telling them that they've got to put in their
10 corrective action program, and we're done with it?
11 Yes, we have other options.

12 Again, like I said, we can use the ROP
13 deviation process to exercise that and say, listen, we
14 think this is really significant, we're going to --
15 even though the action matrix, and we'll get to the
16 action matrix shortly, defines baseline inspection,
17 because they're in Column 1, we could actually do a
18 95001 if we thought it was necessary.

19 Because that's what the deviation process
20 allows us to do. But a lot of that will be a judgment
21 at that point.

22 CHAIRMAN SKILLMAN: Thank you.

23 MR. MERZKE: Sure.

24 CHAIRMAN SKILLMAN: In those cases where
25 you exercised your Appendix M and you were in

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1 qualitative space, did you fire off a 95001 for those
2 white findings for flooding?

3 MR. MERZKE: Yes, sir, absolutely.

4 CHAIRMAN SKILLMAN: You did?

5 MR. MERZKE: Yes.

6 CHAIRMAN SKILLMAN: And what was the
7 licensees response to that?

8 MR. MERZKE: They prepared for the United
9 500 inspections and followed through. As for their
10 root cause evaluation, they knew they had issues, they
11 knew they were wrong.

12 So, we called them on it and they accepted
13 the consequences.

14 CHAIRMAN SKILLMAN: Okay, thank you.

15 MR. MERZKE: Yes, sir?

16 CHAIRMAN SKILLMAN: Were there any yellow
17 findings out of that? I think there might have been a
18 yellow findings at Monticello?

19 MR. GIBBS: I believe we did have one
20 yellow finding. Jeff Mitman, are you here? I think
21 we may have but I don't --

22 (Simultaneous speaking.)

23 Jeff Mitman, with our Division of Risk
24 Assessment, may have more information.

25 MR. MITMAN: Yes, this is Jeff Mitman, I'm

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1 a Senior Risk Analyst with the NRR Division of Risk
2 Assessment. There were multiple yellow findings along
3 the way.

4 Most of them were qualitative, but we
5 always were able to at least get some bounding
6 information about quantification.

7 The problem tends to be on whether we can
8 come up with a good hazard curve or not. And when
9 you're extending hazard curves out to low frequencies,
10 the uncertainty is very high, there's not a lot of
11 data, there's a lot of skepticism on it.

12 And that's often why we would go into
13 Appendix M, because of the uncertainty on the hazard
14 curve.

15 We pretty much understand how the plant
16 responds to a flood, what equipment is lost at what
17 elevations. But the hazard curve becomes problematic,
18 and understanding where the hazard curve is.

19 And that can drive the risk results
20 directly. So, that's we were over in Appendix M space
21 and there were multiple yellow findings along the way.

22 CHAIRMAN SKILLMAN: Thank you.

23 MR. MERZKE: All right, moving on, I'll
24 discuss the SRM-SECY-137.

25 In that SRM, the Commission disapproved

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1 the Staff's recommendation again to use qualitative
2 measures to supplement quantitative risk evaluations,
3 and directed the Staff to enhance the existing STP for
4 conditions that are not currently modeled in the PRA.

5 The Commission also noted the overall
6 structure of the existing ROP should be preserved.

7 And the Commission also directed the Staff
8 to develop appropriate performance indicators and
9 thresholds for new reactors, specifically in
10 Initiating Events and Mitigating System Cornerstones,
11 or to develop additional inspection guidance to
12 address any shortfalls to ensure that the cornerstone
13 objections are adequately met.

14 And finally, the Commission directed the
15 Staff to explore how the current safety system
16 functional failure of PI would be applied to the
17 passive safety-related components in Generation 3 Plus
18 reactors.

19 And those are the AP1000 ESPWR-type
20 reactors. So, that was our last direction from the
21 Commission.

22 In response to that SRM, the Staff is
23 delivering a notation vote paper to SECY for signature
24 at the end of this year, December, 2017, to respond to
25 the Commission direction.

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1 How we got here is we involved internal
2 and external stakeholders, including Nuclear Reactor
3 Regulation, the Office of New Reactors, the Regions,
4 industry, ACRS here, and the public.

5 We had several public meetings. The Staff
6 maintains existing risk thresholds, consistent with
7 Commission guidance and the SRM-SECY-10121.

8 We're preserving the existing ROP
9 structure and we'll be providing the Commission an
10 integrated description of the ROP for new reactors,
11 which basically is the white paper which we provided
12 to you all for review.

13 Moving on, I'd like to give a quick
14 tutorial of the ROP, again, for those folks who are
15 not totally familiar.

16 The ROP is the NRC's program to inspect,
17 measure, and assess the safety and security
18 performance of commercial nuclear power plants and
19 respond to events in any decline in performance.

20 It has several objectives. It needs to be
21 risk-informed, objective, predictable, understandable,
22 open and transparent.

23 And I think we heard mention of the
24 previous oversight program prior to the ROP being in
25 existence, and it probably didn't meet any of those

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1 objectives.

2 A quick tutorial, the ROP framework is in
3 front of you. It starts with the NRC's safety mission
4 of protecting the public health and safety.

5 How do we do that? We need to ensure the
6 safety of the public in three specific areas --
7 reactor safety, strategic performance area, radiation
8 safety and safeguards.

9 Under those strategic performance areas,
10 we have seven cornerstones of safety we called them.
11 Each cornerstone is there.

12 The performance of the licensees measured
13 in each of these cornerstones of safety, and they
14 consist of the initiating events.

15 And the initiating events or the objective
16 of the cornerstones is to limit the frequency of those
17 events that upset plant stability and challenge
18 critical safety functions.

19 In the event that we have an initiating
20 event, the next cornerstone moves to mitigating
21 systems.

22 And mitigating systems, the objective is
23 to monitor the availability, reliability, and
24 capability, of systems that mitigate the effects of
25 initiating events to prevent core damage.

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1 In the event of the mitigating systems
2 fail, we move to the Barrier Integrity Cornerstone.

3 The objective of this cornerstone is to
4 provide reasonable assurance that the physical design
5 barriers protect the public from radionuclide releases
6 caused by accidents.

7 When all else fails, the final safety net
8 is the emergency preparedness cornerstone, and that,
9 the objective is to ensure licensees are capable of
10 implementing adequate measures to protect health and
11 safety during a radiological emergency. Those cover
12 reactor safety strategic performance area.

13 The cornerstones for radiation safety
14 involve public radiation safety and occupational
15 radiation safety.

16 Both of those have the same objective,
17 similar objectives, to protect the public from
18 exposure to radiation. And the occupational radiation
19 safety is to protect the workers.

20 And under safeguards, we have one
21 cornerstone, security.

22 And security, the objective is to provide
23 assurance the licensee's security system, material
24 control and accounting programs use a defensive, in-
25 depth approach, and can protect against the design-

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1 basis threat from radiological sabotage from external
2 threats and the loss of radiological materials.

3 Underpinning all those cornerstones are
4 what we call the cross-cutting areas. There are three
5 -- the human performance, safety-conscious work
6 environment, and problem identification resolution.

7 Where did those come from? When the ROP
8 was developed, it was kind of determined that plants
9 that had significant performance problems in the past
10 generally exhibited significant performance problems
11 in one of these three areas, or more than one of these
12 three areas.

13 So, those three cross-cutting areas
14 actually underpin all the cornerstones and can affect
15 performance in each of those cornerstones.

16 What do the cornerstones mean?
17 Satisfactory licensee performance in each of the
18 cornerstones provides reasonable assurance to the
19 Staff that the facilities are being operated safely
20 and that the NRC's safety mission is being
21 accomplished.

22 So, how do we measure performance in those
23 cornerstones? We measure them in by two inputs; each
24 cornerstone has baseline inspection results and
25 performance indicators.

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1 Performance indicators, briefly, are
2 voluntary data reported to the Commission on a
3 quarterly basis on various plant parameters, which
4 gives us some reasonable assurance of performance in
5 those areas.

6 The baseline inspection in those areas
7 complement the performance indicators, and inspections
8 conducted in areas that are measured by those
9 performance indicators.

10 In those two inputs, inspection and
11 performance indicators, there are significant
12 thresholds associated with those.

13 Baseline inspections result in findings,
14 findings we need to determine the significance of, and
15 that's what the Significance Determination Process is.

16 And once we cross the threshold, that
17 feeds our action matrix, and the action matrix
18 determines our regulatory response, which provides the
19 predictable objective and open objectives of the ROP.

20 Similar to the baseline inspection
21 results, performance indicators do the same thing.

22 They are preset thresholds for our
23 significance, and if a licensee reports data that is
24 exceeding the threshold, that data will report it as
25 either -- I cover that as green, white, yellow, or

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1 red.

2 And again, once those significance
3 thresholds are tripped, that input goes into the
4 action matrix, again, to use for our regulatory
5 response.

6 So, that's how we measure performance in
7 each of those cornerstones.

8 And critically, the action matrix concept,
9 I spared the Committee Members the actual action
10 matrix because it's very busy and hard to read on a
11 slide. So, I'll throw the concept on here.

12 MEMBER POWERS: But it is so nifty. The
13 beauty of the action matrix is it's so clear --

14 MR. MERZKE: It's very prescriptive, it's
15 predictable, and objective.

16 MEMBER POWERS: Predictable and reliable.

17 MR. MERZKE: Yes. There are five columns
18 in the action matrix.

19 Columns 1 through 5, starting on the left,
20 licensee's response, that's when the licensee data
21 inspection findings performance indicators report is
22 green.

23 That licensee will get baseline inspection
24 program and nothing more, as far as the regulatory
25 response.

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1 When a licensee starts getting findings
2 or performance indicators across thresholds, they'll
3 start moving right in the action matrix.

4 Column 2, the regulatory response column,
5 might be one or two white findings, or a white input
6 from the PI and a white finding.

7 Moving to Column 3, the greater
8 performance column, again the significance increases
9 here.

10 There might be a yellow finding or a
11 yellow performance indicator, or multiple white
12 findings.

13 As we move further right, Column 4,
14 multiple-repetitive-degraded cornerstone, licensee
15 gets a red finding or PI would fall into this
16 category.

17 Licensees that move to Column 5 will be
18 determined to be an unacceptable performance.
19 Licensees are not allowed to operate in that column,
20 so they would be ordered to shut down and we'd move
21 them to the IMC 053 process.

22 As you'll note, as we move to the right in
23 the action matrix columns, it's increasing safety
24 significance, where we're increasing NRC inspection
25 efforts.

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1 As the licensee moves to each of those
2 columns to the right, there's additional supplemental
3 inspections, 95001, which is maybe another 40 hours of
4 additional inspection.

5 A degraded performance licensee would have
6 a 95002 inspection, up to 200 hours of additional
7 inspection.

8 And the licensee in Column 4 might see up
9 to 3000 hours of additional inspection, which is a
10 significant team inspection.

11 So, there's significant inspection effort
12 increase as the licensee moves right in the action
13 matrix.

14 Also, there's an increasing NRC licensee
15 management involvement in increasing regulatory
16 actions associated with the licensees with degrading
17 performance.

18 The ROP has four specific program areas.
19 They consist of the assessment program, the
20 performance indicators, the baseline inspection, and
21 the Significance Determination Process.

22 I'm the Assessment Program Lead so I'll
23 cover assessment, and at this time, the Staff is
24 recommending no changes to the Assessment Program or
25 the action matrix for assessing licensee performance

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1 for new reactor designs.

2 There's no technical basis to make any
3 changes to the action matrix based on what we know.
4 So, that concludes my portion of the background and
5 ROP tutorial.

6 Does anybody have any questions before we
7 move on to performance indicators?

8 MEMBER POWERS: Well, I would just say
9 that Members are not familiar with the action matrix
10 to look at it.

11 MR. MERZKE: The action matrix can be
12 found in Inspection Manual, Chapter 0305. I don't
13 know if it's on the public website other than being in
14 that Inspection Manual chapter.

15 But it's very prescriptive on
16 communications, management oversight, and regulatory
17 actions associated with that.

18 MEMBER POWERS: There's a great deal in
19 it.

20 MR. MERZKE: There's a lot of information
21 in it. It's very busy.

22 MEMBER POWERS: It's precisely says how
23 the agency's resources are marshaled when there's
24 degrading performance.

25 MR. MERZKE: Thank you, sir.

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1 MEMBER BLEY: I have one more at a high
2 level. I'd like to ask it now rather than in the
3 Significance Determination Process talk.

4 We were talking to some other groups of
5 Staff recently. This isn't really your bailiwick I
6 guess in developing this, but where in the coordinated
7 effort trying to get ready for the first new plant to
8 begin operation does the development of the Staff's
9 PRA models fit?

10 It seems to me, to be able to carry out
11 what we'll see in the Significance Determination
12 Process, Staff needs a PRA. It's going to be a fair
13 amount of work to develop a new PRA for one of the new
14 plants.

15 And I don't think anybody's working on
16 that now.

17 At least that's the impression I got, and
18 maybe we won't get one actually operating but we
19 better have one quite a time before it begins
20 operating for you to be able to carry out your plan.

21 CHAIRMAN SKILLMAN: I'd like to make a
22 high-level comment too, back on Slide 15, please, Dan.

23 MEMBER BLEY: Can he answer mine?

24 CHAIRMAN SKILLMAN: Please, I was reading
25 the body language up here and I thought that had been

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1 absorbed and stopped.

2 MEMBER BLEY: That's all right.

3 CHAIRMAN SKILLMAN: I'm sorry.

4 MR. MERZKE: I guess to answer that, I
5 don't know what work is being done to develop the PRA
6 in the SPAR models.

7 MEMBER BLEY: But where does this come
8 together? That's what I'm asking.

9 MR. AYEBUSI: So, I'm not sure that I
10 have an actual --

11 MEMBER BLEY: That's all right.

12 MR. AYEBUSI: -- I have the direct answer
13 to your question. I mean, what I do know is we do
14 have SPAR models for the design and like you said, we
15 do need SPAR models for the plants, specific to the
16 plants.

17 And I know Andrew Johnson is here from
18 DCEP and there's an implementation plan for the
19 transition to operations, and what I'm not sure of is
20 if that includes developing the SPAR models for
21 individual sites.

22 MEMBER BLEY: I'm not sure either because
23 we haven't gotten a hint.

24 MS. HAYES: I'm Michelle Hayes, I'm an ex-
25 Branch Chief for NROSPRA, and research has a contact

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1 to develop SPAR models for the individual sites.

2 MEMBER BLEY: They do? Okay. That's
3 good. Some of them didn't know that, though, the last
4 time we talked with them. I won't say who, but I'm
5 glad it's there. I'm sorry, Dick.

6 CHAIRMAN SKILLMAN: I'm responding to your
7 comment, Dan, that no change to the assessment
8 program. Let me bring your attention back to Slide 11
9 just for a second.

10 I remember when this concept became firm
11 guidance from the Regions, and we all learned about
12 the seven cornerstones. And it's been some number of
13 years.

14 What's changing in my mind is mitigating
15 systems. There are mitigating systems, but there are
16 also mitigating physical phenomenon to which
17 requirements are attached.

18 So, to your comment, Dan, probably no
19 changes to the assessment program, I'm wondering if m
20 mitigating systems now has two pieces?

21 One piece is that population of SSCs upon
22 which we depend for protection of the barriers, the
23 fuel boundary, the reactor coolant system pressure
24 boundary, and the containment boundary.

25 But if now there isn't a new subgroup of

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1 physical phenomenon that are just as important, heat
2 transfer across the containment for an AP1000, passive
3 flow rate for plants where there will be no pumping
4 function for decay heat removal.

5 In the first case, it's probably BTEs per
6 hour per square foot, or kilowatts per square meter
7 per second, or whatever the metric might be, that
8 needs to be confirmed from time to time to determine
9 or to prove that the design basis physical phenomenon
10 remains capable of providing the function for which it
11 is intended.

12 Hence, I'm thinking that when we say
13 there's no change to the assessment program, here's my
14 real concern. I want to talk about getting caught up
15 in the ether.

16 So, when you go to buy a new truck, colors
17 are just right, wheels are just right, engine's just
18 right, all the trim is just right, and it's about
19 \$10,000 more than you really want to spend.

20 And boy, that salesperson is really,
21 really good and you end up with keys for a brand-new
22 truck and you say I don't know how I got drawn into
23 that, I never should have done that.

24 I feel as though we can get drawn into a
25 fog here with this low CDF and low initial LERF, and

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1 not step back and say wait a minute, even though those
2 numbers are really mighty low, there are other
3 features for which we must be very cautious.

4 And we must make sure that those features
5 are able to deliver what it is we are intending them
6 to deliver in safety space.

7 And I think that's a mind change, and that
8 was suggested to me that there might be a change to
9 the assessment program called Passive Features
10 Recognition or Passive Features Accreditation.

11 Something that kind of says to everybody this is
12 not the same game.

13 For these new reactors, there's another
14 element of thinking that we've got to be sensitive to.

15 MR. MERZKE: I recognize exactly what
16 you're saying. I'm not sure what you're implying
17 belongs in assessment space as opposed to inspection
18 space.

19 CHAIRMAN SKILLMAN: Well, it's a program
20 change from the perspective of we've become so
21 familiar with SSCs, we depend on them in every plant
22 in the country today.

23 And we're moving in the future to a design
24 where the SSC is no longer that feature that is most
25 important to us.

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1 In fact, it's passive heat transfer, and
2 oh, by the way, a valve on a tank that's sitting up on
3 the top of the containment.

4 And unless we're thinking about those
5 passive features as a physical phenomenon, we're
6 probably back in the good old structures, systems, and
7 component, space.

8 MR. MERZKE: What I was going to suggest
9 is that under inspection space, the design basis
10 assurance inspection, which is formerly the component
11 design basis inspection, would probably be the most
12 appropriate mechanism.

13 The team that goes on site would be
14 looking at exactly what you're talking about.

15 CHAIRMAN SKILLMAN: But that's fine from
16 your perspective; how about the poor guys, men and
17 women, in the control room where they have that fire?

18 And someone says, you know, I'm not so
19 sure we ought to keep operating. The fire's out, all
20 of our systems are operating normally. There isn't
21 any real casualty other than we're minus one pump and
22 our tech specs allow us to run with three pumps.

23 Someone finally says do you think we degraded
24 the inside of containment where we're no longer
25 operable relative to heat removal for ECCS?

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1 I'm suggesting that is a mental change
2 that ought to be somehow embedded in the assessment
3 program. Leadership's understanding of this subtlety
4 of that type of phenomenon, how important it is.

5 Because that's what's really different.

6 MEMBER RAY: Can I make a comment?

7 CHAIRMAN SKILLMAN: Go ahead, Harold.

8 MEMBER RAY: It seems to me like the
9 pressure regaining function of the containment is a
10 passive function, very similar to what is now going to
11 be relied on in terms of heat transfer.

12 And that's validated periodically by a
13 pressure test, as we all know.

14 I think what you're talking about, and I
15 believe I'm agreeing with the Staff's comment, is more
16 are we testing this capability often enough, not are
17 we assessing it in this program that we're talking
18 about today. That's my two cents' worth.

19 CHAIRMAN SKILLMAN: Thank you, Harold.
20 The difference between what Harold is communicating
21 and what I'm communicating, I understand containment
22 leak rate tests and proof of the pressure function.

23 I'm suggesting that there can be a subtle
24 change to the physical phenomenon upon which the new
25 design is depending. And its degradation might not be

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1 intuitively obvious.

2 You've got to be thinking about it and
3 saying, you know what, we might have harmed that and
4 we wouldn't know because we're sitting in this air-
5 conditioned control room.

6 That's the point I'm trying to make.

7 MR. MERZKE: And it's a good point and I
8 agree. And again, we're going to have present
9 inspectors on site.

10 In the event that something like that does
11 happen, well, the licensee's going to have to declare
12 at least an usual event.

13 And likely, there'll be a reactor
14 shutdown, and most likely, there'll be a special
15 inspection team launched from the Regions, would be a
16 guess just based on your scenario.

17 CHAIRMAN SKILLMAN: And my response would
18 be if that's codified, then I agree with you.

19 MR. MERZKE: Okay.

20 CHAIRMAN SKILLMAN: I agree with you.

21 MR. MERZKE: That's our SOP at this time.

22 CHAIRMAN SKILLMAN: And see, what that
23 might suggest is that where before, one might have
24 taken a fire as an unusual event and declared
25 operability and kept on operating, one might now say

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1 fire, unusual event inside containment for an AP1000,
2 that's probably an inspectable event.

3 And we might have to bring in an
4 inspection team for that.

5 MR. MERZKE: Correct, I would agree with
6 that.

7 CHAIRMAN SKILLMAN: And if that's
8 codified, then I'm with you.

9 MR. MERZKE: Okay, sir.

10 CHAIRMAN SKILLMAN: Okay? Thank you.
11 Thanks, Harold, thank you.

12 MR. MERZKE: Okay, I guess I'll turn it
13 over to Ayo now to discuss the PI program. Ayo?

14 MR. AYEBUSI: Excuse me. Good afternoon,
15 my name is Ayo Ayegbusi. I am a Risk and Reliability
16 Analyst in the Office of New Reactors, NRO, not NRR.

17 And so I'm going to be going over the
18 appropriateness of existing PIs and thresholds for new
19 reactors.

20 Dan covered SECY-1281 earlier. I just
21 want to point out here that SECY did evaluate, again,
22 the systems performance indicator index.

23 And part of that evaluation was the Staff
24 pointed out that the indicator is risk-informed,
25 meaning some quantitative risk assessment is used as

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1 input into that indicator and used to set the
2 thresholds for that indicator.

3 That evaluation determined that the MSPIs
4 would be an effective, and determined an appropriate,
5 regulatory response for new reactor designs.

6 And the reason for that was because it
7 would be very unlikely to cross the green-light
8 threshold, and it would require significant change to
9 the NEI-9902 guidance as it is written.

10 All right, so for the next bullet, this
11 SECY-1281 did not evaluate all the other PIs.

12 I should say here that the MSPIs, there
13 are five of them, but in total, we have 17 PIs so the
14 12 other PIs were not evaluated in this SECY.

15 The Commission came back and directed the
16 Staff to provide a discussion of the appropriateness
17 of existing performance indicators, in this case, the
18 other 12 PIs and the related thresholds for new
19 reactors.

20 I should say I'm going to go into a lot of
21 background before we get into what we did for this
22 current paper.

23 So, going on into the background, in
24 response to the Commission's directive from SECY-1281,
25 the Staff developed SECY-13137.

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1 And in this SECY, we reviewed all the
2 existing PIs and the related thresholds to determine
3 their appropriateness for new reactor designs.

4 The conclusion was that the PIs would
5 remain applicable to new reactors, with minor
6 adjustments, particularly to the NEI guidance as I
7 mentioned earlier.

8 We also would like to point out that the
9 plant scrams complication indicator would need to be
10 supplemented with additional guidance, particularly
11 for new reactor designs, to account for passive
12 systems and the reliance on emergency DC power instead
13 of AC power for current plants.

14 In response to that SECY, the Commission
15 came back and directed the Staff to develop
16 appropriate performance indicators and thresholds for
17 new reactors, or develop additional inspection
18 guidance to address any identified shortfalls.

19 Continuing on the background, I just
20 wanted to discuss a little bit about the PI program,
21 just to give you more details about how the program
22 works.

23 So, the PI program provides a sample of
24 objective data to assess reactor facility performance
25 in each cornerstone there that Dan went over.

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1 Along with inspection findings, the PI
2 data serves as inputs to the ROP assessment process,
3 and could potentially lead to additional inspection
4 efforts, known as supplemental inspections.

5 The performance indicator data is
6 voluntarily collected by the reactor facility and
7 reports it to the NRC on a quarterly basis.

8 For each indicator, there are objective
9 thresholds that establish a level of regulatory
10 engagements for reactor facility performance in each
11 cornerstone area.

12 The data that is reported to the NRC is
13 verified by resident inspectors on a frequent basis.

14 The PI performance bands, as you see here,
15 are similar to those used for inspection findings.
16 And how it typically works is the plant stays in the
17 green band, and when the threshold is crossed, the
18 plant is moved to either the white or the yellow.

19 I should say that most of the PIs do have
20 thresholds going from green to white, yellow, and red.
21 There are a few that are just green to white. Sorry.

22 One correction on this slide, it's
23 supposed to say risk-informed PIs and deterministic
24 PIs, not versus deterministic PIs. The reason for
25 that is obviously the whole process is risk-informed.

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1 What we wanted to emphasize here was a
2 situation or cases where quantitative risk assessments
3 is factored into the development of the PI threshold,
4 or is used as an input to determine if the plant
5 performance is across the threshold.

6 So, many of the PIs are not directly risk-
7 informed in the sense I just described, but they're
8 based on regulations and standards that would apply to
9 new reactor design.

10 For example, emergency response, the
11 requirements were a number of drills that would apply.
12 And then as Dan mentioned earlier, occupational and
13 public radiation safety would also apply in this case.

14 The PIs or the performance indicators that
15 are directly related to risk or are risk-informed are
16 the MSPIs and plant scrams. As I mentioned, there are
17 many PIs and their thresholds are more deterministic.

18 They're based on quantitative risk
19 assessment, assessment of risk, to determine those
20 thresholds and agree to apply them between NRC and
21 industry.

22 CHAIRMAN SKILLMAN: Would you please
23 explain -- what you said is you introduced the slide,
24 you said there is an error. And I'm not quick enough
25 to understand what it is that you were pointing to,

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1 and I don't want to miss it.

2 MR. AYEGBUSI: That's fine. So, the title
3 of this slide, which says Risk-Informed PIs Versus
4 Deterministic PIs. We wanted it to say Risk-Informed
5 PIs and Deterministic PIs.

6 CHAIRMAN SKILLMAN: Thank you very much.

7 MR. AYEGBUSI: So, the point of this slide
8 is to show you all the performance indicators that we
9 have for each cornerstone.

10 And the performance indicators that are
11 not marked by an X are the indicators that have, as I
12 described earlier, some risk-informed, quantitative
13 risk-informed, application to it, whether it's in the
14 threshold or the input into the indicator.

15 MEMBER KIRCHNER: Can you show that slide
16 without the Xs? Thank you. So, maybe this is a good
17 point to ask a question.

18 Since you're developing a technology-
19 neutral approach, some of the new designs would remove
20 one of the traditional barriers.

21 Instead of having the three that we
22 conventionally think of, fuel pressure boundary for
23 the coolant and containment, some of the new designs
24 would not have a containment or a confinement in its
25 place.

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1 Some of the really new designs wouldn't
2 have fuel as we know it, it might be in a liquid form.

3 So, my question is how, if you're doing
4 this in a risk-informed manner, do you change the ROP
5 to adjust to the fact that some of the new designs
6 will be even more dependent on the remaining two
7 barriers than the traditional three that we've seen in
8 the LWR fleet?

9 Do you change the inspection frequency?

10 What changes in the application of this
11 when these often passive components now are more
12 important in the defense of the public safety, et
13 cetera, et cetera, radiation safety, and safeguards?

14 How does this adapt, how would the ROP
15 adapt, to the fact that these new designs may not have
16 the traditional defense in-depth?

17 MR. MERZKE: Again, we focused our review
18 specifically on the AP1000, but recognizing there are
19 other technologies that are out on the table right now
20 and even on the drawing board stage right now.

21 We would do the same thing as far as
22 making recommendations to change the ROP for every one
23 of these new technologies. We look at each of these
24 PIs; would they be appropriate PIs for that new
25 technology or not?

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1 In some cases, we determined that, like
2 for the AP1000, the MSPI indicators were not
3 appropriate. So, we'll eliminate them. What do we do
4 when we eliminate a PI?

5 We replace it with inspection or ensure
6 that the current inspection program, in this case,
7 ensures the objectives of the mitigating systems
8 cornerstone are met either through inspection or
9 through those performance indicators.

10 So, we will either develop new performance
11 indicators based on what we know about that technology
12 if we can, or we will supplement that to oversight
13 with inspection.

14 MEMBER KIRCHNER: So, the inspection
15 frequency could be higher, for example --

16 MR. MERZKE: Frequency and scope.

17 MEMBER KIRCHNER: -- and scope for a
18 particular system component. Okay, thank you.

19 MR. AYEGBUSI: Okay, so I'm going to focus
20 on the risk-informed PIs.

21 The Mitigating System Performance Index
22 measures readiness of systems to perform their safety
23 function by focusing on the unavailability and
24 unreliability of systems and components that meet one
25 of the five systems listed here.

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1 The Commission's safety goals are used to
2 establish the PI threshold for the Mitigating System
3 Performance Index.

4 For the plant scrams, they measure the
5 rate of scrams per year and provide an indication of
6 core damage frequency.

7 The data is normalized to 7000 critical
8 hours based on expected capacity factor of plant
9 operation of 80 percent. The impact of plant trips on
10 industry-wide plant risk was used to inform the PI
11 threshold.

12 So, this is one of the cases where a
13 simplified risk assessment model was run to determine
14 how many plant scrams, how many scrams will cause the
15 plant to -- the change in core damage frequency to
16 trip the threshold.

17 And that number was used to inform the
18 thresholds for this performance indicator.

19 MEMBER STETKAR: Before you leave this, I
20 need some help. you characterize the current, in this
21 PI, index as a risk-informed index. And certainly,
22 I'm not an expert on this, I don't do this kind of
23 stuff.

24 But reading the white papers that you're
25 going to talk about in a second here, there's

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1 discussions of things like front-stops and backstops.
2 And if it doesn't do this then you put this number in,
3 and if it doesn't do that, you put this other number
4 in, and you make what seems to be patchwork decisions,
5 even in the current reactors. That's what I want to
6 get to.

7 For the current operating fleet, you've
8 got some sort of numerical criteria like, well, we
9 won't assess it as more than 5 times 10 to the -7
10 because we won't.

11 So, could you explain just how those are
12 applied in practice? What are those front-stops and
13 backstops, and that jargon that tends to be used?

14 MR. AYEGBUSI: Okay, so --

15 MEMBER STETKAR: So, you basically can get
16 a green to white transition when you want it, even
17 though the numbers don't show it?

18 Or you can prevent the green to white
19 transition, even though the numbers on a current
20 snapshot from the three-year running total might
21 indicate that you might get one?

22 So, how are you artificially kind of
23 kicking stuff up and artificially suppressing stuff
24 with those other things that you apply?

25 MR. AYEGBUSI: Are you referring to --

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1 MEMBER STETKAR: I don't know what I'm
2 referring to because I don't actually apply this.

3 I've never heard about it until I started
4 to read the white papers, and said, well, yes, we get
5 into this situation and we apply this backstop, or we
6 have this front-stop, or we apply this 5 times 10 to
7 the -7.

8 It's got a name that I can't find in my
9 notes here, risk limit, or something like that.

10 Which, to me, sounds like a quite
11 arbitrary process but I want to understand it because
12 you're arguing that the whole MSPI framework cannot
13 apply for new reactors.

14 And I'm not sure how it's applied for
15 current reactors.

16 MR. MERZKE: I'm not a PI expert.

17 MEMBER STETKAR: No, I'm not either, and I
18 naively thought that these were objective quantitative
19 measures that were updated periodically.

20 And I'm finding that there's an element of
21 truth to that, but there's apparently some other
22 pieces that get applied.

23 MR. MERZKE: These are values that are
24 calculated and reported by licensees --

25 MEMBER STETKAR: I understand that, and I

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1 also am beginning to understand that there's some sort
2 of really complex algebra --

3 MR. MERZKE: I think you're right.

4 MEMBER STETKAR: -- that's more complex
5 than what I naively thought was simply looking at the
6 performance of residual heat removal or something like
7 that on a three-year running average.

8 And saying, okay, I had one failure in the
9 last year, and therefore, my estimated failure rate on
10 my throughput running is X. And I'm still under the
11 industry average, and therefore, I'm still green.

12 I had one failure and I'm above X but,
13 gee, nah, I'm going to apply some sort of suppression
14 effect.

15 MR. GIBBS: Okay, so, if I may, I recall,
16 and I think we owe you something on this --

17 MEMBER STETKAR: I have no idea, because
18 honestly, I'm being a bit provocative here, but I only
19 in the last week tried to read through this stuff.

20 And we have so much stuff to read that I
21 can't read everything, that I stumble across these
22 other -- in some places, there's things that are
23 characterized as a front-stop, there are other things
24 that are characterized as a backstop.

25 And I can't find the term because I'm

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1 searching through my notes here, but there was
2 something like a 5 times 10 to the -7 risk limit or
3 risk something or other, that sounded like it was
4 plugged in, in some cases, so that you couldn't get
5 any more detriment than that amount, if you will, that
6 numerical amount.

7 MR. GIBBS: And I will admit, my vague
8 recollection, back many years ago when the performance
9 indicators were established, we, indeed, and someone
10 who works in our division of risk assessment may
11 recall, or not, that we did types of sensitivity
12 studies with the information to help us risk-inform
13 these performance indicators.

14 So, you would take the information from a
15 performance indicator, and do that sensitivity study
16 using a probabilistic risk assessment to check where
17 possibly maybe a backstop might exists. Honestly,
18 that seems like a reasonable approach that I think we
19 may have done.

20 But I think, Dan, we owe maybe what was
21 done to risk-inform these numbers, and where, what,
22 was the basis of these backstops? I just don't know.

23 MEMBER STETKAR: The reason I ask is
24 people are using this process today, and however the
25 algebra evolved over time, it's an evolved algebra

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1 that people are using.

2 And there's some level of comfort of with
3 it, both from the industry and the inspectors, the
4 Staff.

5 The white papers, both the industry's and
6 the Staff's white paper, regarding MSPI have basically
7 said, well, that concept is not going to work for new
8 reactors for a variety of reasons that I could take
9 issue with individually.

10 But it sounds to me, and I might be wrong,
11 that there were equal problems with just a naive
12 application of a risk-informed index based on some
13 sort of rolling measure of equipment or system
14 performance as the current process evolved.

15 And there was some sort of negotiated set
16 of values or backstops or something that got plugged
17 into that algebra.

18 And if I were more familiar with that and
19 could think of that in the context of some of the
20 arguments that were made why the whole concept of an
21 MSPI can't be applied to new reactors, it might help.

22 And as I said, I literally was not aware
23 of these other numbers, whatever they are.

24 MR. AYEGBUSI: Let me try. Like Dan said,
25 this is definitely not my area of focus, but let me

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1 try to give a perspective.

2 So, looking at the white paper, right, not
3 the MSPI program, looking at the white paper for this
4 activity, there are two aspects to the NEI guidance
5 that we have to consider.

6 MEMBER STETKAR: Okay, for a second, from
7 my perspective, I don't care what the NEI guidance
8 says. I'll set my mental model with that.

9 The NEI guidance was developed for current
10 operating reactors, and it kind of works for that.

11 MR. AYEGBUSI: Correct.

12 MEMBER STETKAR: And so as far as I can
13 see, my opinion is people can rewrite a report, and
14 train new people on new reactors to think a different
15 way.

16 So, I don't care what the old NEI guidance
17 says when I'm thinking about new reactors.

18 MR. AYEGBUSI: I understand that.

19 MEMBER STETKAR: I understand your
20 perspective but I'm just giving you my perspective on
21 it.

22 MR. MERZKE: This is my understanding of
23 the MSPI. These are active safety systems, and again,
24 I stress safety systems, high-pressure injection, heat
25 removal, residual heat removal, emergency AC power,

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1 those are the ADGs.

2 These are all component systems that are
3 testing, regular maintenance. They assume run
4 failures, that's adds to the reliability index.

5 Unavailability because of maintenance, charging
6 pumps out of service for six weeks because there's
7 being maintenance being done on it, whatever.

8 All this adds to what we call unavailability and
9 that time is punched into a computer somewhere and it
10 comes out with this number that says, okay, this is
11 what your MSPI is because of a number of failures or
12 whatever.

13 MEMBER STETKAR: There's some algebra
14 someplace.

15 MR. MERZKE: It's a black box to me, it's
16 a little computer. None of these are what we consider
17 safety systems anymore.

18 What these are now is what we call RTNSS,
19 Regulatory Treatment of Non-Safety Systems. These are
20 still important systems but they're not considered
21 safety-related systems.

22 Now, the safety-related systems are the
23 passive safety systems. Passive safety systems I
24 guess are really what, and I hate to use the word
25 inherently reliable because how do you test those?

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1 MEMBER STETKAR: This is going to devolve
2 into something that I was going to try to stay away
3 from, but I can't.

4 So, how does the reactor oversight process
5 for, and I'll limit it to the AP1000 rather than
6 trying to get it to any new reactors, assess the
7 grading performance of squib valves? How do you
8 assess that? How are you going to assess
9 that?

10 MR. MERZKE: I have the very same
11 question.

12 MEMBER STETKAR: Tell me exactly how
13 you're going to do that. I'm not going to get into
14 safety systems or any of the other philosophical stuff
15 about importance to shutdown risk.

16 I'm not talking about RTNSS. Squib valves
17 --

18 MR. MERZKE: And neither are we.

19 MEMBER STETKAR: -- I'll call them the
20 whole set of I think 12 explosive valves in that
21 plant. How are you going to do that?

22 MR. MERZKE: You can't test the squib
23 valves because they're one and done.

24 MEMBER STETKAR: Well, I'm sorry.

25 MR. MERZKE: If you (Simultaneous

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1 Speaking) them off, you have to replace them.

2 MEMBER STETKAR: All right, but you must
3 monitor squib valves for standby liquid control
4 systems and boiling water reactors today, and the last
5 time I checked, the last time you could check those,
6 you had to blow them up and they weren't there either.

7 So, the whole concept of not being able to
8 test a squib valve like a motor-operated valve applies
9 to currently operating reactors.

10 Everybody's comfortable with standby
11 liquid control systems for boiling water reactors with
12 squib valves?

13 MR. MERZKE: My understanding with the
14 squib valves is that the detonators that'll be used in
15 those valves are basically produced in lots and the
16 vendor inspectors are pulling samples from those lots
17 to test the explosives.

18 MEMBER STETKAR: And when you say those
19 valves, you mean the standby liquid control for
20 boiling water reactors?

21 MR. MERZKE: I'm referring to the squib
22 valves for the AP1000. This is my understanding.

23 MEMBER STETKAR: I'm trying to challenge
24 you as to conceptually why is a big guy squib valve
25 for something called an AP1000 conceptually different

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1 from a little guy squib valve for a boiling water
2 reactor, in terms of the ability of the licensee and
3 the NRC Staff to monitor its performance?

4 And have confidence in the fact that
5 they're not degrading, or that a specific plant's
6 treatment of those valves, whether it's testing or
7 maintenance or inspection or whatever, is not
8 degrading?

9 MR. AYEGBUSI: so, if I can answer that --

10 MEMBER STETKAR: That doesn't have
11 anything to do with lots of explosive charges or
12 anything like that.

13 MR. AYEGBUSI: So, if I could answer that
14 question. I've worked with boilers before and I've
15 looked a little bit at the AP1000's requirements and
16 tech specs, right?

17 And from what I see, I don't see any
18 difference or any significant difference in the
19 requirements for testing, such as checking electrical
20 continuity and things of that nature, online.

21 And requirements for doing testing, I
22 forget the frequency and tech specs. And then you
23 follow the standard for if you do have a failure to
24 increase a population.

25 So, I don't see that that process is going

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1 to be any different from what's being done for the
2 screw valves in boiling water reactors.

3 MEMBER STETKAR: Okay, so if I hear you
4 say that, then why in your white paper do you say,
5 well, there's no way we can develop and index for what
6 I'll call the first bullet there, a high-pressure
7 injection, which you've used the squib valves as a
8 shortcut for, for new reactors because they don't test
9 the valves and the valves are going to be very, very,
10 very reliable?

11 MR. AYEGBUSI: Well, so the first thing
12 there is we actually developed an index. What we said
13 was that that index would not be a good enough index
14 to determine appropriate plant performance, something
15 of that nature.

16 So, we did develop the index, but when you
17 look at trying to exercise the index, and I forget
18 which one of the -- there were four, one for black.

19 And the lowest threshold you would have to
20 cross from green to white would be six failings of a
21 valve, which, that was high, one.

22 Two, at that point we thought there would
23 be other inspections, other activities going on,
24 right, that we felt that index would not be a good
25 indicator of plant performance.

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1 MEMBER STETKAR: Okay, and that brings me
2 back to the negotiated algebra for the current MSPIs,
3 that if an algebra was negotiated to put in front-
4 stops and backstops, or whatever they're called, for
5 current MSPIs, why couldn't a similar algebra,
6 conceptual algebra, be developed in the new plants?

7 Such that if you feel uncomfortable that
8 you need six or more failure before you can transition
9 to a green to a white, you develop a different
10 algebra, so that Staff has comfort that we're tracking
11 degrading performance, that we're measuring degrading
12 performance?

13 MR. AYEGBUSI: So, a couple of things to
14 that.

15 MEMBER STETKAR: And then I'll come back,
16 if you could give me assurance, the answer to my first
17 question is how will the Reactor Oversight Process for
18 new reactors provide assurance that we do not have a
19 plant-specific degradation of the squib valves?

20 What elements of the Reactor Oversight
21 Process, given the fact that we're not going to have
22 some sort of numerical index for those valves?

23 How will the Reactor Oversight Process
24 raise the flag if I'm starting to see increasing
25 numbers of failures of those valves, or increasing

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1 unavailability?

2 Because I can take a squib valve out of
3 service, I can take firing circuits out of service.
4 It's a very normal operation.

5 I'm allowed to do that by my tech specs,
6 but there's an unavailability and unreliability
7 conflict.

8 MR. GIBBS: Right, let me try this.

9 First of all, the existing Reactor
10 Oversight Process, we intentionally provide overlap
11 between the performance indicators and the inspection
12 program.

13 That's intentional for what we don't know
14 really, and so that's very important, the first point.

15 MEMBER STETKAR: Please, if you have a --

16 MR. GIBBS: No, no, keep --

17 MEMBER STETKAR: Well, I was going to say,
18 so what I'm hoping I'm going to hear you say is that
19 you're going to explain to me how the inspection
20 program now will provide that surrogate confidence?

21 Because I don't have an indicator right
22 now.

23 MR. GIBBS: No, I don't know, Steve may
24 know, but I do not know what we plan to do with the
25 squib valves specifically with respect to inspection.

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1 I don't know if we're making adjustments
2 to our program in that regard. Steve, could you
3 comment on that?

4 MR. CAMPBELL: We have not looked at squib
5 valves specifically for the inspection program.

6 The way I understand it's done today is
7 they take a sample from a lot, for the BWR and the
8 standby liquid control system, and do a sample of that
9 to see if they explode.

10 I know that there's been an information
11 notice back in the '80s on squib valve failures. I
12 haven't looked at that in too much detail but we have
13 not looked at that from an AP1000 perspective.

14 Now, so if there's some degradation of a
15 squib valve, yet, in the current program, this is the
16 way we would do the squib valves for standby liquid
17 control, if that degradation does not result in that
18 valve being non-functional or inoperable, that issue
19 would screen to green of very low safety significance.

20 Now, that does not mean that we're done.
21 That means that the licensee is required to correct
22 that problem.

23 So, right now, in the Manual, Chapter 609,
24 Appendix A, there are a number of screening questions,
25 and they're very powerful screening questions in that

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1 regard. And so there's the specific question about
2 degradation, yet, operable.

3 If that is the case, it would screen to
4 green in the Significance Determination Process. Of
5 course, we as an agency are growing, a learning
6 agency.

7 If we begin to see problems, we're going
8 to take the necessary actions, meaning more squib
9 valves are failing than we expected for example.

10 And so I just wanted to clarify the
11 existing process, make sure you understood how that
12 works and how it is intended to work for new reactors
13 for the light valves.

14 Jeff, do you have anything?

15 MR. MITMAN: Yes, I would add that if the
16 problem with the valves rises to the point of a
17 failure, we can identify performance deficiency, and
18 then we can take the performance deficiency, put it in
19 a PRA model, and calculate the impact on the risk.

20 And from there, we can get a potentially
21 greater-than-green run. I haven't looked at the
22 AP1000 design but I understand that the squib valves
23 are quite important, and so that's why there's a lot
24 of attention on them.

25 So, we start to see a lot of failures, the

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1 failure rates are going to be higher, and we can
2 modify the -- do an on-the-fly Bayesian update of the
3 failure probabilities, come up with new failure rates
4 and see what the risk significance is.

5 And if it gets really high risk
6 significance, that's going to drive a plant over in
7 the action matrix, which will draw more attention,
8 more resources, and more oversight on the process.

9 So, hopefully, the mixing of the
10 inspection process and the oversight portion of it,
11 the STP portion of it, will ensure that if there is a
12 higher failure rate than what we were anticipating, it
13 would get the regulatory scrutiny and oversight.

14 MR. MILLER: Without trying to add too
15 much fuel to the discussion here, but trying to point
16 something out, as far as what I understand, in the
17 current MSPIs.

18 As opposed to what we're looking for for
19 new reactors, current MSPIs are things, high-pressure
20 injection, the heat removal, RHR, emergency AC power.

21 We have tests that we can do with the
22 plant operating, that give us good indication of the
23 performance of those systems.

24 We also do inspections of those but the
25 PIs are measuring things that are testable.

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1 The squib valves, as you already aptly
2 pointed out and Ayo backed up, slick system and BWR,
3 you don't test those, you don't have a good index for
4 them, but you, during the inspection and the outage,
5 would blow a sample similar to what you do with SRVs.

6 You don't light off an SRV and see if it
7 relieves at the right set point. You take them off
8 during an outage and you go set them to a bank to test
9 them.

10 These systems here, in most of the safety
11 systems, not the RTNSS system, but the safety systems,
12 are inside containment, and you don't have access to
13 them.

14 You don't have inspection access and you
15 don't have tests that you can test, of course, a lot
16 of the safety, or the passive systems.

17 So, to develop something, a PI that can
18 help you trend before you can get in there at each
19 outage, you really don't have anything that can give
20 you additional information that you can't get by
21 inspecting during the outage inspection.

22 That's the difficulty of coming up with a
23 risk-informed MSPI for these, is that really, when
24 you're going to get your information is during the
25 outage, and you've got eyes on during an inspection

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1 during the outage to see that.

2 MEMBER STETKAR: The problem that I have
3 is I hear all of these arguments as excuses for not
4 wanting to do something.

5 And I use squib valves only because
6 they're kind of a poster child, or they're not tested
7 very often, and yet they can be important contributors
8 to overall risk.

9 And in fact, somehow the industry and the
10 Staff are dealing with an analog of them in BWRs today
11 and have been dealing with that analog for 30 years or
12 more. And yet, you're saying, well, we can't deal
13 with them for the new plants.

14 I don't get that. I don't get why you
15 can't. The other systems that are listed here, I read
16 in the white paper arguments it says, well, residual
17 heat removal.

18 Well, yes, you know, the passive residual
19 heat removal system just has a couple of valves that
20 have to open and we don't test those valves very
21 often.

22 And the active, the normal residual heat
23 removal, system is only operated during shutdown, so
24 we don't get many operating hours on that. So, how
25 can we develop an index in case one of those pumps

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1 fail?

2 Well, of course you can. Normal residual
3 heat removal systems in operating plants only operate
4 during shutdown. That's when you gather all of the
5 operating hours and most of the starts and the stops
6 on the bump.

7 So, there's no difference in the normal
8 residual heat removal system on the AP1000 versus a
9 normal heat residual system. Compound cooling water
10 system and service water system on the AP1000 are
11 going to be operating all the time.

12 They're not called safety systems but
13 they're going to be operating all the time when that
14 plant is running.

15 So, you're going to have a whole bunch of
16 operating hours and starts and stops on pumps and
17 opens and closes on valves and those systems. So,
18 they're not like squib valves.

19 So, saying that, well, the only time they
20 might be important is shutdown, and by the way, we
21 don't have a shutdown risk assessment so we don't know
22 how important it is for overall risk.

23 I don't get the whole rationale for saying
24 we can't monitor these systems because they're not
25 safety-related and it's a new reactor.

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1 MR. MILLER: Could I ask you a question on
2 that?

3 MEMBER STETKAR: Sure.

4 MR. MILLER: This is Chris Miller -- are
5 you saying that RTNSS -- really, is your point more
6 that RTNSS systems could be and should be monitored?
7 Is that what you're saying?

8 MEMBER STETKAR: My point is that
9 arguments saying that we can't do it simply because
10 it's a new reactor and the core damage frequency is
11 small is not an appropriate argument to me.

12 And, yes, we can develop meaningful
13 measures of availability and reliability of RTNSS
14 systems because we have data for that.

15 Now, the unavailability might be higher
16 than currently operating plants because they're not
17 safety-related and tech specs allow you to have it --
18 there are no tech specs on it basically.

19 So, the unavailability of those numbers
20 might be different. But just because the numbers are
21 different doesn't mean that we can't monitor that as a
22 measure of performance of the plant.

23 Are we letting that stuff degrade?

24 And without the numerical index, I'm
25 looking for what part of the Reactor Oversight Process

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1 is providing us comfort that people aren't allowing
2 the service water and complement cooling water and
3 normal residual heat removal systems to just sit there
4 and degrade, despite the fact that somebody hasn't
5 named it safety-related?

6 MR. MERZKE: I didn't do the leg work on
7 the white paper but I'm going to throw out a guess
8 here in that they didn't develop a performance
9 indicator for the RTNSS systems because they're not
10 safety-related. However, we will adjust,
11 and it's partly based on the inspection presentation
12 coming up, we will be inspecting RTNSS systems at a
13 minimum, as part of the minimum scope of the
14 inspections.

15 MEMBER STETKAR: And I'll be quiet now
16 because I've made my point. I'm really interested
17 when you get to the baseline inspection about how
18 you're going to address this.

19 And I haven't heard anything yet that
20 gives me comfort about what you're going to do about
21 the squib valves.

22 Because they're not RTNSS, they are
23 safety-related pieces of equipment, so you can't
24 dismiss them as non-safety-related.

25 MR. GIBBS: So, let's reflect on the

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1 maintenance rule, which the maintenance rule, of
2 course, will apply to new reactors and the maintenance
3 rule specifically talks about non-safety-related
4 systems that are important to safety.

5 And licensees are required to maintain
6 these systems effectively.

7 So, that's not the whole answer, I think
8 part of its inspection.

9 But I think from a regulatory perspective
10 and what we have within the ROP, the maintenance rule
11 is a very important rule that we affirmed some years
12 ago in that regard, I believe in '94 or so.

13 MR. CAMPBELL: Technical specifications
14 requires them to test their safety systems, or I don't
15 know what they're going to lead in for AP1000, but
16 they also have the onus to put degrading issues into
17 the corrective action program, which is also available
18 for inspectors to review and determine whether they've
19 been addressed.

20 CHAIRMAN SKILLMAN: I want to just comment
21 that I'm in agreement with John, and this goes back to
22 my comment about the ether getting so comfortable with
23 this notion that we have such low initial CDF and LERF
24 that these, if you will, systems for which MSPI has
25 been, if you will, abandoned, probably shouldn't have

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1 been.

2 We do have data on these systems that are
3 RTNSS, that are important to safety. They play a
4 minor role, if you will, in terms of how the license
5 is written, but they can play a major role in terms of
6 damage reduction or damage prevention.

7 So, it seems to me it would not be
8 difficult simply to say even though these systems are
9 not required in terms of the license for the, if you
10 will, safe shutdown of the plant or the prevention of
11 core damage, nevertheless, they present the defense in
12 depth, that is part of almost the culture of this
13 business, and we're going to keep track of this stuff.

14 And it's easy to do that. I mean, it
15 really is easy. I spent years at the plant; there are
16 individuals who can take that reliability and
17 availability data and pull that number together in a
18 matter of 30 minutes for a quarterly report.

19 MR. AYEGBUSI: So, going back to your
20 point, the big thing we have to remember about RTNSS
21 is it's the regulatory treatment of non-safety
22 systems. Regulatory treatment is critical to the
23 whole thing. The first part is those,
24 the Commission has required us to have those because
25 of the uncertainty of the passive systems.

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1 For example, you might have insulation on
2 the passive pipe that might degrade and might not give
3 you that thermal degrading that you need. So, these
4 systems were identified.

5 There's a criteria of, a set of, five
6 items that they have to meet if they're needed to meet
7 the safety goals, respond to I think it's a station
8 blackout, post 72-hour actions. So, RTNSS components
9 were identified using a certain criteria because of
10 that concern.

11 The other aspect to RTNSS components or
12 SSCs is that the three -- part of the regulatory
13 treatment, three items are required that the licensee
14 has to take, one of which is they have to monitor
15 their availability and reliability of those SSCs,
16 right?

17 And one of the things we did was require
18 that for passive plant designs, you have to identify
19 RTNSS systems using the process, the set of five
20 items, you have to identify them, and then you have to
21 include them as SSCs that have to be monitored in
22 making sure.

23 And so the availability and reliability of
24 those SSCs will be monitored, right? There are two
25 other requirements as far as quality assurance. Well,

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1 as far as regulatory treatment. So, one is
2 availability and reliability controls.

3 The other is quality assurance. For
4 quality assurance, all RTNSS SSCs identified have an
5 augmented quality assigned to them. And there's one
6 other item which I'm trying to remember.

7 I don't know remember that off the top of
8 my head, but there's one other regulatory treatment
9 requirement that the plants have to meet. So, they've
10 just been thrown to the wayside.

11 Now to John's comment, the paper. I
12 worked with the folks that developed the paper and our
13 conclusion was not that we can't monitor.

14 Whether it's RTNSS SSCs, or we can't come
15 up with an index, our conclusion is yes, we can. We
16 can come up with an index for the safety valves, which
17 we did, we evaluated it. We can come up with some
18 kind of MSPI equivalent for RTNSS SSCs.

19 However, our conclusion by going through
20 that process was that if we did an MSPI-like program
21 for RTNSS SSCs, the more likely it is to never cross
22 the threshold. Right?

23 Based on the fact that there's a heavy
24 reliance on the passive system, which is driving the
25 lower risk profile of the plant. That's one.

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1 So, that takes care of MSPI. For the
2 valve index, it wasn't that -- the conclusion wasn't
3 based on not having enough testing or operation of
4 those valves.

5 The conclusion was based on if we wanted
6 to follow the MSPI process, that was one aspect.

7 If we were to follow the MSPI process, we
8 wouldn't be able to implement the program as is
9 because it looks at a three-year period and you look
10 at what testing and operation of those components have
11 been done.

12 But if you look at just the valve index
13 alone, all it was was to look at how many failures did
14 you have and how many times did you -- how many
15 demands did you have on those components, right?

16 And when we looked at that, one thing we
17 had to remember is we've said testing is only going to
18 occur during an outage when you take the valve out,
19 right?

20 So, if you have a set of 12 valves and you
21 test 20 percent, say 3 valves. If one fails, you have
22 to expand the population, right?

23 So, any of the testing, if you end up
24 having four or five failures, for example, before you
25 hit a satisfactory number, all that information on

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1 data would be acquired during an outage.

2 And so what we found by coming up with the
3 index is that to cross from green to white, the least
4 number you would need to cross from green to white for
5 any one of those indexes would be six failures --
6 well, seven failures of a valve, right?

7 And our conclusion was that at that stage,
8 there is going to be a significant inspection effort
9 going on that just having that information during an
10 outage window, as opposed to being able to track --
11 you're not going to have the opportunity to track
12 failures over time.

13 Because the failures that would have
14 occurred during an outage window would not be
15 sufficient to support tracking plant performance, from
16 a PI perspective. Because it's supposed to track
17 performance over time.

18 So, that was our conclusion. Now, I think
19 I would agree with the comment from Mr. Stetkar that
20 there is potential to have unavailability, right?

21 I don't remember what the tech spec says
22 for squib valves, for example, but there is that
23 potential to de-energize a squib valve. I don't know
24 what the tech spec says on that, and that may be
25 something to look at.

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1 However, that is covered in tech specs,
2 for example, but that may be something to look at.
3 But that was where we came out with RTNSS and the
4 white paper.

5 MEMBER STETKAR: Let me just finish a
6 thought here. There are a lot of concepts in those
7 white papers. There's the concept of
8 you don't want an index that is too numerically
9 volatile that suddenly tosses you way up or throws you
10 way down, just because you start counting one or two
11 more failures.

12 And I get that, but there are ways to
13 dampen that behavior, numerical ways to dampen that
14 behavior.

15 The issue that I'm trying to grapple with
16 is not the issue of, well, you have to get to six
17 failures in a given outage before you trip a green to
18 white transition.

19 Because I'll grant you that if you had six
20 failures in an outage, it's going to get somebody's
21 attention somewhere.

22 I at my plant in this outage have one
23 failure and I do some more testing and I didn't have
24 any more. The next outage, I have another failure.
25 I've got to do some more testing and I don't have

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1 anymore.

2 The next outage I got two failures, I've
3 got to do some more testing. That's not what I would
4 expect from squib valve.

5 That's not consistent with the very low
6 failure rates that have been used for those valves.
7 And how does that type of behavior trip some attention
8 that I might have degraded performance?

9 And if it's through the maintenance rule,
10 I'm happy to hear that. If it's not through the
11 maintenance rule, then where is that raising
12 inspectors' attention?

13 MR. AYEGBUSI: So, if you look at the
14 inspection process, I doubled this multiple times as
15 an inspector. The way you would have safety valves,
16 every outage, there's always one or two that fails.

17 And so the way process works is these are
18 safety-related SSCs and if you look at criterion 16 of
19 Part 50 of Appendix B, you can't have a repeat failure
20 over 60 related -- I forget what we call it now. A
21 SCAQ, a significant condition of adverse quality.

22 So, what we looked at there was if during
23 -- so, for your example, you test the squib valve, you
24 have a failure of a valve. That failure is going to
25 get inspected.

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1 Why? Because it's a safety-related
2 system, it's an outage. That's the only time you're
3 going to get access to inspect the valve. What are
4 the causes of the failure of that valve that are going
5 to get inspected?

6 Three years later, there's another test,
7 if that's what the tech spec requires. You have two
8 more failures. The first failure that would have
9 required a root cause evaluation.

10 The next failures that you have requires
11 another set of root cause evaluations. What I looked
12 at was have you identified a different root cause for
13 this failure?

14 If you have, then it's just another
15 condition-adverse quality. If you have not, and it's
16 similar to the previous failure, the way the process
17 works is now it becomes an SCAQ.

18 And that's a whole other process because
19 that would be a violation of that particular
20 requirement.

21 So, that's a whole other process and
22 that's something that we'll definitely be accounting
23 for in the inspection space.

24 MEMBER STETKAR: Thanks.

25 MEMBER SUNSERI: So, I'm going to ask a

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1 question here that there's probably not a good answer
2 for, so I'm maybe not really looking for an answer.

3 I'm going to preface my remarks with I'm
4 in favor of the Reactor Oversight Program and the
5 benefits it's made to safety of the operating fleets.

6 So, with that said, I think part of the
7 success of the ROP, as it currently exists, is because
8 we had a good foundation of operational history with
9 the existing fleet.

10 We understood the risk, we understood how
11 the system failures affected the risk, we knew what
12 kind of inspection results we were getting.

13 We know how it all tied in and we created
14 a nice, action matrix that allowed the regulator to
15 become more intrusive in situations where more
16 intrusiveness was necessary in order to protect people
17 and the environment when a reactor wasn't working
18 right.

19 So, what it seems to me is we don't
20 understand the new plants well enough to apply the
21 existing Reactor Oversight Program and the Gap
22 analysis you've done.

23 And I know that sounds harsh and critical
24 but from listening to the discussion here that we've
25 had, it almost sounds like we're in a situation of

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1 bending to fit and paint the match so we can link up
2 the action matrix with these new plants and make our
3 nice model work so that we can become an intrusive
4 regulator.

5 And I'm not sure -- I'm not against being
6 an intrusive regulator when it's necessary, but I
7 think in some of these cases, it seems like we're
8 being intrusive for the sake of being intrusive and
9 actually not benefitting, protecting people and the
10 environment on the associated risk.

11 So, I don't know if that means we need to
12 make more investment in smaller models for specific
13 plants or whatever model it needs to be to help us
14 understand the new plants better, and how these
15 individual failures like John's bringing up is
16 probably a good example.

17 If we run that through this whole process,
18 does it work? Is it inspectable? Does it give you
19 the right risk numbers? Do we understand what that
20 risk magnitude is?

21 And does that warrant intrusiveness on the
22 part of the regulator and everybody involved in this
23 process for the protection of the people and the
24 environment, which is our ultimate mission?

25 In my superficial example here, let's say

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1 that I'm a safety regulator and I get a papercut.
2 Well, a papercut might be 10 to the -7th issue, right?
3 Well, if I get two papercuts and it's twice that, do I
4 require more intrusiveness on the regulation? I say
5 no.

6 But yet, I heard an example here where if
7 something's 1 times 10 to the 7th, and we double it
8 and 2 times to the -7, then maybe we ought to be more
9 intrusive in that because we double the risk factor,
10 which I'm not sure that warrants the benefit that
11 we're getting.

12 But anyway, so I've made my point. So,
13 the question is are we putting the energy into the
14 right space?

15 Should we be learning more about how
16 they're anticipating to operate, and what kind of
17 failure modes and risk levels are there associated
18 with the new design?

19 So that we can actually see how this is
20 going to work, similar to what we did with the
21 existing fleet.

22 MR. MERZKE: Just to address your -- you
23 referenced the I guess example I threw out there
24 earlier on when we were discussing relative risk, and
25 how maybe doubling the risk might lead us to maybe

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1 consider additional regulatory action.

2 I was just throwing numbers out of the
3 air.

4 MEMBER SUNSERI: And I wasn't picking on
5 you, that was just a good way of trying to illustrate
6 my point.

7 MR. MERZKE: An example of relative risk.

8 MEMBER SUNSERI: Right.

9 MR. MERZKE: And really, that's one of the
10 reasons why this Staff kind of rejected it, is it's
11 very difficult to set, establish a technical basis of
12 what percent is significant.

13 MEMBER SUNSERI: And don't get me wrong
14 here, I know we need to do something, we need to have
15 something.

16 We need to have a strong and robust regulatory
17 oversight process for the new reactors.

18 I just don't know if we're heading in the
19 right direction with this one, because we don't know
20 enough about the output.

21 MEMBER STETKAR: I'll just throw out
22 further that the folks who put together the construct
23 in Reg Guide 1.174, which is now accepted by everyone
24 as fundamental guidance for the agency, had to
25 struggle with why did they put the grey transitions

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1 where they put the grey transitions?

2 That wasn't an easy decision, but somebody
3 had to make it. And after a lot of discussion in the
4 agency and discussion with stakeholders, those
5 decisions were made and they were determined to be
6 reasonable and pragmatic.

7 So, just because something is difficult to
8 do doesn't mean you ought not to try to do it.
9 Because we have experience of people making those
10 decisions in the past.

11 It took time to do it, though. It's not
12 something that you do in six months to get ready for a
13 plant starting up two years from now.

14 You need to start thinking about it early
15 on and you need to start thinking about it in the
16 context of not just an AP1000 squib valves.

17 But if this is going to apply to a broad
18 spectrum of new reactor designs, many of which have
19 passive systems, some of which don't --

20 MR. GIBBS: So, Dan, I want to address
21 your thoughts there on --

22 CHAIRMAN SKILLMAN: Please let me
23 interrupt for a second. I would like to ask Odunayo if
24 you could do your next four slides quickly so that we
25 can take a 15-minute break, and then get back to this?

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1 May I ask?

2 MR. GIBBS: May I just quickly move
3 forward?

4 CHAIRMAN SKILLMAN: If you can keep that
5 to a minimum.

6 MR. GIBBS: Right. The first thing I'd
7 like to say is that I believe the NRC is a very
8 flexible regulator. And flexible, what I mean by
9 that, I mean there are things that we don't know, but
10 when we find out information, we do respond.

11 I'll give you an example of the process
12 that is called Tipper Instruction.

13 When we uncover information, we formulate
14 that in the way of a new inspection, and then we go
15 out and we get more information to help us better
16 inform what our inspection program may need to be
17 changed to adapt to that new information.

18 That's the first point. Because I don't
19 know that we know everything and we have to maintain
20 that flexibility.

21 The second point is I think the Commission
22 acknowledged this whole notion of lack of operational
23 experience.

24 In fact, the Commission directed the Staff
25 to produce a qualitative framework for situations for

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1 new reactors that have limited operational experience.

2 And indeed, we intend to do that. I just
3 want to make those two points to address your specific
4 concern about the direction we're heading with new
5 reactors.

6 Thank you.

7 CHAIRMAN SKILLMAN: Okay, thanks. Ayo, go
8 ahead, please?

9 MR. AYEGBUSI: Okay. All right, so what
10 covered previously to this slide was all background
11 information of what got us to the recommendations we
12 were making in the next SECY paper.

13 And the first thing I want to address is
14 there were two industry white papers. They evaluated
15 all performance indicators for applicability to
16 AP1000.

17 The one white paper covered all PIs for
18 the MSPIs. And then the other white paper covered the
19 MSPIs. And the conclusion of both white papers was
20 that all the PIs except MSPI are applicable with
21 limited changes to the PI program.

22 And it was determined that the MSPI would
23 be an adequate tool to measure performance for the
24 AP1000 design. And again, that was due to a lack of
25 data and limited testing and cycling of SSCs.

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1 In addition to that, the NRC did come up
2 with a white paper that arrived at a similar
3 conclusion to the industry white papers, but went a
4 step further to evaluate if there was the potential of
5 -- a potential indicator or index that could give us
6 insight on plant performance over time.

7 And one of the things we looked at was
8 safety valve and reliability index.

9 And what that really was was identifying
10 all the safety valves and figuring out which valves
11 had some active component to them, and then binning
12 them as far as whether it's an air-operated, motor-
13 operated screw-valve, or solenoid-operated.

14 And then evaluating if each index would be
15 of any value to marginal performance again over plant
16 operation.

17 MEMBER STETKAR: Ayo, just for the
18 purposes of the record and clarity, when you say
19 safety valve on reliability index, you're not talking
20 about a spring-loaded safety valve?

21 You're talking about unreliability index
22 for safety-related valves, because you said motor-
23 operated valves, solenoid-operated valves, air-
24 operated valves, squib valves?

25 Is that correct?

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1 MR. AYEGBUSI: That is correct.

2 MEMBER STETKAR: Okay, thank you.

3 MR. AYEGBUSI: That's correct. All right,
4 so this index, after looking at it, it was proven to
5 be impractical due to limited testing of the valves
6 during operation.

7 Again, we currently don't have any
8 industry data and we would need -- if we wanted to
9 follow the MSPI program, but in general -- we would
10 need three years to collect data, which is one of the
11 guidance in the NEI document.

12 And then, it has little sensitivity to
13 failures, as we talked about earlier.

14 You would need, at the very minimum, six
15 failures to cross the green-to-white threshold, and I
16 believe for one of the indexes, you could have an
17 unlimited number of failures without crossing the
18 green-to-white threshold.

19 The other aspect is we identified 45
20 valves, 32 of which we identified had an active
21 component. And compared to an MSPI index or any type
22 of index, that's a limited set of components to
23 monitor.

24 And we felt that you were looking at very
25 few risk-significant components and the index around

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1 that would also not provide the type of performance
2 feedback that we're looking for.

3 This slide is pretty much what I've talked
4 about before. I just wanted to point out on plant
5 scrams that the thresholds there were conservatively
6 set for the existing fleet.

7 And so after we looked at it, we think
8 that the existing thresholds of performance bound the
9 lower risk of new reactors.

10 In conclusion, the SECY paper that will be
11 going up to the Commission, overall, the Staff is
12 recommending a relatively modest adjustment to the
13 program areas of performance indicators.

14 In the case of plant scrams, it will be
15 applied as is with the same thresholds -- we
16 recommended it's applied as is with the same
17 thresholds.

18 In the case of plant scrams with
19 complications, we also recommend to apply as is but as
20 we discussed earlier, tweaking the NEI guidance or
21 adjusting NEI guidance to account for passive systems.

22 And the difference is what a complication
23 would look like for a new reactor versus a current
24 fleet.

25 And then we're recommending not applying

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1 the MSPI index to the AP1000 design, and along with
2 that, we did not identify any new PIs that we felt
3 would fit under the mitigating system cornerstone,
4 although, we determined it to be needed.

5 But going back to some of the conversation
6 we've had, we're definitely going to be looking for
7 opportunities once we have some operating experience.

8 And on the current plants, the new
9 reactors are required to have a PRA, which, part of
10 that would be collecting data on all SSCs' failure
11 data, data on availability, data on reliability.

12 We can then use that to inform the process
13 over time. And that's all I have.

14 CHAIRMAN SKILLMAN: Okay, questions? Any
15 questions before we take a 15-minute recess, please?

16 MEMBER KIRCHNER: I had one. It would
17 seem to me that with regard to the MSPIs, the five
18 systems that you identified for the existing fleet
19 are, in one fashion or other, active systems.

20 But if you step back from how active they
21 are to function, it would seem to me that even the new
22 reactors in one form or other will require these
23 functions. And that would provide a basis for
24 defining performance indicators.

25 You are going to have to have -- as John

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1 gave an example, even the passive plants when shut
2 down will have some residual heat removal trying to
3 function while they're doing refueling, et cetera.

4 So, there's a function that is almost
5 traceable back to the GDCs for each of those five
6 systems that will still, in one form or other, have to
7 be addressed in these new and advanced plants. So,
8 that becomes an open-ended question.

9 Well, that would be my approach to the
10 MSPIs for new plants to look at it from a function
11 standpoint.

12 And because you're at a disadvantage also;
13 a lot of these are paper designs so there isn't any
14 detail as to many of the supporting systems and plant
15 layouts that will come only much further on, and with
16 the PRA, that will indicate which, or if, any of these
17 systems are important to safety.

18 MR. AYEGBUSI: If I may respond to that?
19 We did evaluate exactly what you just mentioned, which
20 is looking at the function, right?

21 So, in the white paper, we looked at the
22 current function, we looked at what those functions
23 are, or would be for the AP1000 design.

24 And some of them would have safety
25 systems, and some of them would have non-safety

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1 systems.

2 But like we've discussed, when you look at
3 the non-safety systems specifically, there's really no
4 feasibly situation where you would actually cross from
5 green to white.

6 So, then that index wouldn't be as
7 meaningful as what we have now. So, we did evaluate
8 that.

9 We evaluated a couple of instances or
10 options given the fact that the design is different,
11 even though the functions are the same.

12 MEMBER KIRCHNER: -- appropriate to pick
13 on one design, but just to make it tactile, with
14 AP1000, you'll still require DC power, right?

15 MR. AYEGBUSI: That is correct. That is
16 the only safety-related power.

17 MEMBER KIRCHNER: So, therefore, I mean,
18 that's the surrogate for emergency power, and I would
19 hope that would be on your inspection program and your
20 monitoring program, right?

21 MR. AYEGBUSI: Yes, so the inspection
22 program, the inspection program takes a list of all
23 the risk-significant SSCs. And so all those things
24 always -- inspection items are picked from that list.

25 So, the DC power, the safety-related DC

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1 power, will be inspected. There's no two ways about
2 it. Excuse me.

3 But then even the monitoring of the DC
4 power, specifically for AP1000, is actually risk-
5 significant.

6 And so it will be inspected because it's
7 part of that list, and that's the list from which to
8 do inspections.

9 MR. MERZKE: Most of that list really
10 comprises the RTNSS systems. They will be inspected.

11 We're adding those to the scope of the
12 inspection procedures as minimum sample sizes for our
13 baseline inspections.

14 MR. CAUFFMAN: Hi, my name's Chris
15 Cauffman, and I just wanted to add just one thing here
16 so that we don't lose sight of it.

17 When the ROP was formed, they came up with
18 PIs, and the idea is the PIs could be used to assess
19 these areas under the cornerstones of safety, which
20 was communicated by Dan earlier here.

21 And then what couldn't be assessed by PIs
22 was to be examined by inspection, okay?

23 So, in this case, there may be a PI, an
24 area of PIs, where we're not maybe doing inspections
25 here, and people seem to be very concerned that we may

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1 be losing something in this area.

2 But inspection can be used to supplement
3 areas where we're not doing PIs.

4 Typically, when we have a PI, it's not
5 valid when we start operating earlier. We do
6 additional inspection to cover the absence of the PI
7 to try to get assurance in those areas where we don't
8 have the PI.

9 With the AP1000, we think that it will
10 probably less sample opportunities. There's more
11 passive system reliance and things like that we can
12 look at.

13 There won't be as many, for example,
14 surveillance tests and things like that being done
15 continuously, which inspectors were looking at with
16 these more active-type components.

17 So, we sort of think we might have even
18 some oversampling for the opportunities or have a
19 robust sampling, just using the existing baseline
20 program that we have right now, until we can learn
21 more.

22 So, personally, I wasn't too concerned
23 with the lack of the PI, you know, the PI not being
24 there, because I think that we can cover that
25 inspection space.

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1 That's all.

2 CHAIRMAN SKILLMAN: Thank you. With that,
3 I would like to take a 15-minute recess. Let's
4 reconvene at 25 minutes after the hour on that clock.

5 (Whereupon, the above-entitled matter went
6 off the record at 3:10 p.m. and resumed at 3:25 p.m.)

7 CHAIRMAN SKILLMAN: We're back in session.
8 Harold, go ahead.

9 MEMBER RAY: Thank you. This is Harold
10 Ray. Several times along the way here, I thought, as
11 one who went through the design certification process
12 for AP1000, that we were revisiting things that were
13 discussed then and seemed to have been resolved.

14 Now, that's not entirely the case. I
15 understand the difference between reactor oversight
16 and design certification.

17 But I just wanted to introduce a question,
18 that when we talk about things, as we have, and I
19 think they're important things to talk about, that we
20 are mindful of what was discussed during the
21 certification process about stuff like squib valve
22 testing and so on.

23 And I know John's talking about how these
24 things are modeled and represented in the risk
25 analysis, which is not the same thing as I'm talking

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1 about, but nevertheless, just always wanting to
2 remember that we're talking about a certified design
3 where some of the issues we're talking about and
4 oversight, may have been discussed ad nauseum during
5 the certification.

6 And you want to look back and keep that in
7 mind so that we're not doing something that was
8 discussed previously. That's all I wanted to say at
9 this point.

10 CHAIRMAN SKILLMAN: Harold, thank you.
11 Thank you for that. Steve, you're up.

12 MR. CAMPBELL: My name's Steve Campbell.
13 I'm in the Reactor Inspection branch under Division of
14 Inspection and Regional Support NNR. I was
15 responsible for reviewing baseline inspection
16 procedures and how they apply to AP1000.

17 So, a little bit of background, something
18 we've talked about quite a bit is SECY-0137, and
19 specifically, in my area, it has to do with developing
20 additional inspection guidance to address identified
21 PI shortfalls to ensure that all cornerstone
22 objectives are adequately met.

23 We have done that, and as I go through
24 the, go through the presentation, you'll see where
25 that guidance has been implemented as through samples

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1 and also through resource allocations.

2 MEMBER BLEY: Bas that been worked into
3 the inspection manual already, or is that --

4 MR. CAMPBELL: No.

5 MEMBER BLEY: -- you have drafts that'll
6 go in?

7 MR. CAMPBELL: We have drafts, yes. What
8 we foresee is taking the existing inspection
9 procedures and making changes to those to address
10 certain areas to add samples or add --

11 MEMBER BLEY: Okay.

12 MR. CAMPBELL: -- more resources to it.
13 Background, also, we've also talked about MSPI quite a
14 bit.

15 And just a reminder, it's to monitor the
16 availability, reliability of safety systems necessary
17 to mitigate accidents.

18 We also touched a little bit about RTNSS,
19 and they are non-safety-related structure systems and
20 components that perform risk-significant functions,
21 and therefore, candidates for regulatory oversight.

22 And we also talked about the last bullet,
23 which is the industry white paper that provided
24 aspects of the ROP for the AP1000 design.

25 And I seem to remember reading that, and

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1 that said, basically, that the use of MSPI right now,
2 without having operational experience, isn't a good
3 indicator until we get that operational experience.

4 MEMBER STETKAR: The, I'll just ask the
5 rhetorical question is, how do you know when you have
6 enough operational experience that you turn it on?

7 The Germans, for example, claim that they
8 never have enough data. They didn't develop risk
9 assessments for years and years and years because they
10 claimed they never had enough data.

11 MR. CAMPBELL: We have a --

12 MEMBER STETKAR: So, how do you know you
13 have enough operating experience and you can --

14 MR. CAMPBELL: Because there was also --

15 MEMBER STETKAR: -- turn something on?

16 MR. CAMPBELL: -- Davis-Besse lessons
17 learned program. We have an operational experience
18 branch in DERs.

19 They look at events throughout the,
20 internationally and also nationally. And anything
21 that's, in my opinion, more than twice, is a trend.

22 And then there would be some discussion
23 and some decision on how we would handle that
24 potential trend that's starting to occur. Either
25 issue some type of generic communication, like

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1 information notice or policy.

2 MEMBER STETKAR: That's more a reactive,
3 once something goes bad, I react to it, perspective.
4 Having four or five years of experience with no
5 failures is also operating experience.

6 MR. CAMPBELL: Correct.

7 MEMBER STETKAR: It gives you confidence
8 that things aren't getting worse. So, just, it was a
9 rhetorical question because you often, in the white
10 paper uses this notion of, well, once we get enough
11 operating experience, we'll go revisit this.

12 MR. CAMPBELL: Right. I was, I duly note
13 what you're saying and this is something that --

14 MEMBER STETKAR: Yes, don't wait for the
15 bad day before you said, well, you know, two years
16 ago, we should've started looking at this thing.

17 MR. CAMPBELL: I was paraphrasing what
18 NEI, the, NEI had come up with, in industry, in terms
19 of how we handle MSPI.

20 MR. MILLER: I will just point out that,
21 you know, it's not the first time we'll bump into
22 that.

23 You know, when you come up out of a, you
24 know, a new startup like, you know, what's part two,
25 or when you, when you have a plant that's been shut

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1 down in the 0350 process for a long time, you, we've
2 had those same discussions.

3 And you know, there's some that would say
4 that trend is a year. Some would say three. I don't
5 think anybody advocates for, you know, your German
6 model of it.

7 (Laughter)

8 MR. MILLER: But typically, we're looking
9 at, you know, three years to get enough data to say
10 it's significant. But there's probably, there's
11 probably work and discussions that could happen on
12 that.

13 MR. CAMPBELL: Okay, next slide. Part of
14 evaluating for AP1000 design only, we looked at, it
15 was me and another person for New Reactor, Office of
16 New Reactors and I think somebody from Region 2
17 construction branch.

18 We reviewed 20 baseline inspection
19 procedures for changes to accommodate the AP1000
20 design.

21 Results of that review, we found that
22 review, we found that few changes are required. We
23 probably, we will probably make adjustments to sample
24 sizes and resource estimates.

25 And we would also include an inspection of

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1 RTNSS in the sample. And the sample ranges are based
2 on, that there are fewer components and there's a
3 lower baseline risk for the AP1000.

4 And also, the range is going to include,
5 we're going to propose risk-important high and
6 intermediate systems to inspect as well.

7 I'm not saying that's a definite, but
8 that's something we're proposing from the program,
9 from the program branch.

10 MEMBER STETKAR: I'll also come back to my
11 former statement where you convinced me, or tried to
12 convince me, that you don't only look at delta CDF.
13 Everything I read focused on CDF, and as does this
14 slide.

15 MR. CAMPBELL: Okay.

16 MEMBER STETKAR: Our experience, from even
17 operating plants, is some stuff is not very important
18 to core damage, but can be really important to public
19 health risk.

20 And that might be even more emphasized in
21 some of the new reactor designs. So, when you start
22 thinking --

23 MR. CAMPBELL: You don't agree with the
24 delta CDF in terms of --

25 MEMBER STETKAR: Delta CDF, there is not a

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1 linear relationship between core damage frequency and
2 large early release frequency, and certainly not when
3 you look at importance of systems and equipment, that
4 there isn't, some stuff is very important to large
5 early release frequency.

6 Just think of steam generator 2 rupture.
7 It's really, really important to offsite releases.
8 It's not very important to core damage frequency at
9 all.

10 And so, if you only focus your attention
11 on core damage, you might be missing stuff. And in
12 the stuff that you miss, on a relative, I hate to use
13 that term. Bad use of terminology.

14 On a, it might be more important on the
15 new plant designs than it is on current, on the
16 current operating fleet because of the integrated
17 notions of maintaining passive core heat removal and
18 containment heat removal using the same stuff. So,
19 just, I'll just throw that out, is --

20 MR. CAMPBELL: Right.

21 MEMBER STETKAR: -- think about --

22 MR. CAMPBELL: And we had to have a
23 starting point, and it would be based on the safety
24 verification matrix that Office of New Reactors had
25 come up with.

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1 And I think it is also in the inspection
2 manual, Chapter 2519. That list of systems and what
3 their importance are. And we use that as what we need
4 to do for samples. Also, the sample range --

5 MR. MERZKE: Can I, can I just toss out a,
6 I just want to throw out a quick comment here. You
7 know, when, our inspection procedures are, offer a lot
8 of flexibility to the inspectors out there.

9 The resident inspectors, they get to
10 choose the samples that they select. And a lot of
11 it's risk informed, will go out there and, okay,
12 what's the most risk-significant system that I haven't
13 inspected in a long time?

14 Or what does the, what's the licensee
15 planning on doing here in the near future that could
16 get everybody into trouble? Maybe I should take a
17 look at that before it happens.

18 With, when we're referencing here, the
19 risk, the high and intermediate risk-important
20 systems, those things just can be referenced in the
21 samples, recommended samples as, okay, you should at
22 least be taking a hard look at these and the RTNSS
23 systems because they're very important.

24 But that, it's not going to inhibit an
25 inspector from going out there and choosing samples

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1 that are more appropriate.

2 MEMBER STETKAR: It isn't, and I'm not
3 implying that it does. What I am trying to challenge
4 is a mindset that says, core damage, core damage, core
5 damage.

6 MR. MERZKE: I understand that. I just --

7 MEMBER STETKAR: So, that, when I'm, when
8 I as an inspector am trying to make that decision of
9 where am I going to focus my resources, I might want
10 to think more broadly.

11 MR. MERZKE: Yes, I understand that. And
12 I think our resident inspectors do that.

13 MR. CAMPBELL: That's really interesting,
14 because my division director and I went out to Vogtle
15 and interviewed the resident there who was at the
16 Chinese reactor, and we also learned that if they
17 don't close a certain door, that it would flood down a
18 sub-compartment B, and within, you know, a cooling for
19 the core. So, this door has to be closed.

20 You know, so those are the things we're
21 learning, and we're going through the training courses
22 to pick up what we need to do to incorporate these
23 procedures. And as the Chinese reactor is getting
24 more operating experience, we'll learn from them.

25 (Laughter)

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1 MR. CAMPBELL: Do you like that? Okay.
2 So, also, our sample range is based on RTNSS, which is
3 what I'd mentioned before. And also, the
4 accessibility of components, whether they're inside
5 and outside containment.

6 In the AP1000, the passive significant
7 components are inside containments, so we'd need to
8 have probably a little bit more inspection focus when
9 that door gets opened up and we have opportunities to
10 look at those components.

11 We looked at the comment on the MSPI, and
12 we looked at the breadth of the baseline inspections
13 and assessed the availability, reliability, and
14 capability of mitigating systems that meets the MSPI
15 purpose.

16 I did a quick review of all of our
17 procedures. It's about 60, 70 percent of these
18 procedures cover that cornerstone.

19 About six of them do not, and those are
20 like fire protection procedures, and service
21 inspection activities, and operator re-qualification.

22 So, the passive systems are expected to be
23 reliable. Compared with the AP1000 baseline, lower
24 baseline risk, we feel that the inspections we have
25 right now are more than adequate to compensate for

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1 MSPI omissions.

2 And we determined that additional
3 inspections are not needed to compensate for not using
4 MSPI indicators for the AP1000 design.

5 I talked about outages. We assessed the
6 staffing during outages. Again, safety-related
7 systems, high and intermediate risk-important systems
8 will be identified, as well as RTNSS, that are in
9 containment.

10 This will require an additional staffing
11 resources be applied there. We would foresee a team
12 being augmented with an additional inspector to assist
13 with conducting equipment walk-downs, surveillance
14 testing, post-maintenance testing, and containment
15 closeout.

16 The other team members would be focusing
17 on outage-related engineering programs. So, in
18 conclusion, we conducted the gap analysis.

19 We found that there were fewer changes to
20 the inspection requirements, and added guidance as
21 necessary.

22 We anticipate adjustments to sample sizes,
23 risk importance, and RTNSS, to be specific. We
24 determined that MSPI not applicable to AP1000 design.

25 AP1000 design has a lower baseline risk,

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1 and IPs, as written, are sufficient to assess licensee
2 performance in mitigating system cornerstone without
3 MSPI.

4 Inspect for resources, we are proposing
5 that an outage inspection team be dispatched from the
6 region to cover outage-related operational and program
7 inspections. And that's it for the inspection part.

8 CHAIRMAN SKILLMAN: Steve, I've got to ask
9 this. You make the, make the argument that the
10 baseline risk is so low and the RTNSS systems will be
11 inspected.

12 But by and large, because the risk is so
13 low, you really don't need the MSPI. What happens if
14 you have your RHR system fail repeatedly during an
15 outage on a fully constructed AP1000 that's run a full
16 fuel cycle, so it's got a full burden of decay heat?

17 MR. CAMPBELL: We'd handle that, sorry,
18 we'd handle that like we do a conventional reactor.
19 We would either listen to it and find out about it
20 through interviews or attending plan of the day
21 meetings, or outage meetings, review condition
22 reports, follow up on how the licensee corrected that
23 condition per their corrective action program.

24 There is a regulatory requirement and
25 criteria in 16 to do that. They would assess that for

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1 performance deficiency, whether that performance
2 deficiency was more than minor.

3 And if it is more than minor, it would be
4 considered a finding, which then would have to go
5 through the SDP. That's how we would handle it, just
6 like we handle conventional reactors.

7 CHAIRMAN SKILLMAN: If that plant were a
8 conventional plant, the consequence of a repeated
9 failure of a safety system can be a yellow finding, or
10 in some cases, a red finding.

11 And so, in the shutdown condition, we can
12 have the identical condition, or the, almost the
13 identical circumstances in terms of risk that we would
14 have, we could have in an, in an AP1000 that we would
15 have in a, in a large four loop Westinghouse somewhere
16 else.

17 So, I'm struggling with this notion,
18 therefore, that MSPI really doesn't have to apply. It
19 seems like it should.

20 MR. MITMAN: If I could add to this, Jeff
21 Mitman again, with the existing fleet, there are no
22 PIs for shutdown.

23 We, when we set up the ROP, we looked at
24 creating PIs for shutdown, and after a long
25 discussion, they pondered it, and they didn't create

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1 PIs.

2 And they relied upon the inspection
3 program and the SDP process to monitor risk and plant
4 performance during shutdown.

5 So, in that aspect, there's no difference
6 between new reactors or the AP1000 and the existing
7 fleet.

8 But you're absolutely right. If there's,
9 if there's repeated failures of a, of a monitoring RHR
10 system during shutdown with the new reactors, there's
11 going to, there is an SDP with the existing fleet.

12 We will modify that and there will be
13 discussion of that later this afternoon about what
14 we're going to do that.

15 And we'll monitor any proposed
16 deficiencies, and you can them graded a green finding
17 on the existing fleet for, or on the, on the AP1000
18 for problems of an RHR system.

19 So, for shutdown, I think we've got it
20 covered. There aren't any differences conceptually in
21 the process for the, for the AP1000 versus the
22 existing fleet.

23 MR. AYEGBUSI: Can I, if I, if I may, can
24 address --

25 CHAIRMAN SKILLMAN: Please, yes.

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1 MR. AYEGBUSI: -- your comment? So, I
2 think we need to really be clear about MSPI and how
3 inspection factors in.

4 The aspect of, the way the ROP is set up
5 is, if you don't have PIs, right, then you should
6 develop inspection procedures, inspections to cover,
7 to cover the areas in each cornerstone. Right?

8 So, what Steve is saying is we're looking
9 at the inspection process or the inspection program
10 and saying, now that we've determined that MSPI would
11 not be of any, would not be of value for monitoring
12 plant performance, are we adequately covering the
13 mitigating system cornerstone in the inspection
14 program?

15 So, it's not to say that the MSPI would
16 not be valuable. It's saying, we recognize that it
17 wouldn't give us value in a performance indicative
18 space. I hope that clarifies things.

19 CHAIRMAN SKILLMAN: I understand the
20 words, but I almost feel as though this is a walnut
21 and pea game and we're just moving the, we're just
22 moving the pea around independent of where the walnuts
23 are.

24 When you, it's almost a word game as
25 opposed to a focus on the function that needs to be

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1 performed, and monitoring that function to ensure that
2 it is provided when it's supposed to be provided.

3 MR. CAMPBELL: There's really nothing
4 different we can do. If you look, take the squib
5 valve for example.

6 What can an inspection do other than
7 follow up on a failure that occurred on the squib
8 valve because they can't light those off? They can't
9 do that.

10 So, if they find in a lot that one didn't
11 work and they have repetitive failures, the inspectors
12 would go in and review what the licensee did and
13 whether their corrective actions were adequate.

14 If they weren't, then there would
15 potentially be a performance deficiency and possibly a
16 finding, and then that would be evaluated for a color
17 significance. There is nothing else we can do with
18 the squib valve. I mean, MSPI --

19 CHAIRMAN SKILLMAN: I would just respond,
20 Steve, that that situation, for a squib valve that
21 remains idle for long time periods and is called upon
22 infrequently, and either succeeds or doesn't succeed
23 when it's challenged, is a very different situation
24 than having an RHR system that is known to be required
25 when the reactor is shut down.

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1 MR. AYEGBUSI: So, for the AP1000, right,
2 the way it's going to be operated is the non-safety
3 systems, which you do have a non-safety RHR system,
4 right, will be used for operation. Right? So, that's
5 one aspect.

6 There is also a passive RHR system, right,
7 which it seems they're related. Right? So, they're
8 two, they're two different systems, but the approach
9 is to use the non-safety systems when at all possible,
10 without challenging the safety system unless required.

11 So, I don't know if you, so that, but the
12 passive RHR system is not an active system. It's just
13 a bunch of squib valves and MOVs that have to be
14 opened to get flow into the core and back into --

15 (Simultaneous speaking)

16 CHAIRMAN SKILLMAN: I'm thinking of
17 shutdown cooling is what I'm, what I'm thinking about.

18 MR. AYEGBUSI: Yes. So, in that case, it
19 would be the non-safety RHR systems.

20 MEMBER STETKAR: Okay. Let me, let me try
21 something here. Two slides ago, Slide 31, says that
22 staff determined that additional inspections are not
23 needed to compensate for not using MSPI indicators.

24 And as I said earlier, I can, you know, I
25 get that if I can gain some confidence from you that,

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1 indeed, I understand how the inspection program for
2 the AP1000 will more appropriately compensate for
3 that.

4 Let me flip it around. Why the heck do we
5 have the MSPI for the current operating reactors if
6 the scope of the current inspection program is
7 adequate to catch everything that I need to catch?

8 In other words, what benefit am I getting
9 today from the MSPI for currently operating reactors?

10 I must be saving inspection resources, or I must be
11 getting some early warning, or I must, there must be
12 some benefit from it because it's there.

13 You're, as I understand this, you're
14 saying, I don't need the MSPI for whatever reason. I
15 have all kinds of rationale.

16 But I can't do it, I don't want to do it,
17 I, you know, can't develop the numerical metrics.
18 Fine. I can live with that.

19 Now, you're saying that you don't need to
20 enhance the inspection program to compensate for that
21 because the current inspection program is adequate.

22 So, well, if that's the case, why the heck
23 do I need the MSPI for current operating reactors,
24 because the current inspection program must be
25 adequate for that without the MSPI for current

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1 operating reactors. So, what do I buy?

2 MR. MERZKE: Let me take a stab at this
3 one. When we say no additional inspection, that means
4 not creating any new additional inspection procedures
5 to monitor mitigating systems.

6 What we, the inspection procedure we have,
7 currently, you know, addressed the availability,
8 reliability of those safety systems.

9 What we need to do and will do is adjust
10 the guidance in those inspection procedures to ensure
11 that we follow up and monitor those systems that are
12 important, like the residual heat removal systems, and
13 the diesel generators, and things that we're not going
14 to, they're not considered safety systems anymore.

15 But we're going to adjust the guidance to
16 make sure that the mitigating systems cornerstone
17 objectives continue to be met with that additional
18 guidance and --

19 MEMBER STETKAR: Let me try this, because
20 we might be talking about semantics here. When you
21 say that no additional inspections are needed, do you
22 mean no more inspector person hours or do you mean no
23 more writing an additional chapter of the inspection
24 manual?

25 MR. CAMPBELL: I'd say yes to, I'd say yes

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1 to both. No more additional, well, additional
2 inspection resources, what I had talked about during
3 the outage.

4 If these plants are a lot, we look at them
5 as being much more safer than the conventional
6 reactors.

7 MEMBER STETKAR: I look at them as being
8 absolutely as safer as the conventional reactors, and
9 I have no idea whether they're safer or less safe
10 during shutdown because, for example, I haven't seen a
11 shutdown risk assessment on them.

12 As best as I can tell, they're no more or
13 less safe during shutdown than a conventional plant.
14 And it's not clear to me whether their risk is
15 substantially lower during power operation, because I
16 haven't seen anybody do an external hazards analysis
17 of them. So, much safer is perhaps your opinion.
18 It's not mine. And certainly not during shutdown.

19 MR. MILLER: So, if I could help a little
20 bit with a couple of the points. One is, to get back
21 to your question --

22 MEMBER STETKAR: But that, I'm not
23 quibbling over shutdown versus power operation. I'm
24 quibbling over the process.

25 There's something here and you just said,

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1 no more inspection resources measured by inspection
2 person hours will be needed to compensate for the fact
3 that I don't have these indices because you've already
4 said, well, if I've got an index, I can use that as a
5 surrogate for inspections.

6 I thought that that's what I understood.
7 And I don't have that index, so I'm going to rely on
8 the inspection program to, the inspection process as a
9 surrogate, for the lack of that index.

10 And as I said, I can, I can live with
11 that. I can get it. I don't know how you're going to
12 do it.

13 MEMBER BLEY: Chris has been --

14 MEMBER STETKAR: Yes.

15 MEMBER BLEY: -- add to this for a while.

16 MR. MILLER: So, the, yes, I think I,
17 perhaps the way I look at how it should be
18 characterized, we took a good look at how you should
19 inspect these plants differently.

20 The first aspect is, you know, they're
21 built differently, and the most important systems are
22 inside containment.

23 And so, how the heck do I get, and the
24 containment is tight and hard to get in, you know,
25 it's going to be hard to get around and whatever. So,

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1 you have, so, you have some challenges there.

2 So, but we do, we do have our, and we may
3 not have a new procedure number, necessarily, but we
4 have changed, you know, the samples and the types of
5 things that need to get inspected at different times.

6 We realize that, really, I mean, you know,
7 the traditional walk-downs that I, as an inspector,
8 both in ROP and pre-ROP, you know, would do. You
9 don't have those opportunities now.

10 We don't think that the PIs are going to
11 give us the same valuable information in the ROP. So,
12 we have to focus our inspections more on the times
13 when we do have that availability. That's during
14 shutdown.

15 And so, we, those procedures are being
16 adjusted. Those samples are being adjusted. I don't
17 think we've come to a, you know, a final point on the
18 number of hours.

19 Steve was giving you a speculation of
20 where we might end up because there's, what, 40
21 percent less active components that you'd, that you'd
22 look at and walk down.

23 But the passive systems, we know that
24 those are very important, and we know that that
25 inspection during shutdown, the last person out of

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1 that containment is going to check some very specific
2 things.

3 Steve mentioned one of them that he and I
4 saw when we were down there. It was like, if you
5 don't get that one right, then, you know, you might as
6 well give up on some of your core cooling.

7 So, there is very specific changes. I
8 don't want you to get, walk away with the idea that
9 we're not making any changes to the inspection
10 procedures. They are.

11 Now, as to value of the, you know, of the
12 PI, why did we, why did we put the PIs in in the first
13 place? And I did inspections before we had PIs in
14 pre-ROP. Right?

15 You know, we found that, you know, if we
16 could give, get somebody to point us to the right
17 systems to put more emphasis on, and that's what the
18 PIs really do.

19 They give more emphasis on the really high
20 risk-significant systems, and they give you more
21 emphasis such that, if you trip, then you, then you do
22 more inspection, 40 hours more, you know, or whatever,
23 120 hours more, depending on if it's a 95001, 95002,
24 or 95003.

25 So, it points you to it, but if you don't

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1 have an indicator that trips, it'll never point you to
2 it.

3 Or if you don't have an indicator that
4 trips until, you know, it takes six times or eight
5 times, and you're not going to see that kind of thing.

6 It doesn't give you a valid method to
7 point you to another inspection. And if you can't do
8 the inspection anyway because, I mean, if you're only
9 going to be doing the inspection during an outage,
10 then it, the PI really doesn't help you.

11 If that's, you know, that's when you're
12 going to get the PI information, and that's when
13 you're going to be getting the inspection, it really
14 doesn't assist you that much if you're going to be
15 looking at that thing, those kinds of things during an
16 outage.

17 So, those are the things you have to weigh
18 when you're balancing PIs to inspection. And I think
19 we've, you know, even pre-ROP, we did a really good
20 job of inspecting and finding areas that, you know,
21 that we felt were risk-significant, and had ways of,
22 and now we have better ways of assessing the risk.

23 So, we'll still have those capabilities
24 with inspection. It's just that we won't have some of
25 the PIs that have been handy in the past, because they

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1 don't have as much meaning as they had before.

2 So, that would be my take on, we have, we
3 have changed, we will change the inspections. We just
4 may not change the inspection numbers.

5 We'll change the sampling, we'll change
6 the focus, we'll change the outage focus clearly on
7 that type of inspection.

8 MR. MERZKE: Maybe I can offer up an
9 example. Currently, inspection procedure 71-111.04,
10 equipment alignment. Okay.

11 The purpose of the MSPI is to ensure,
12 well, availability and reliability of those safety
13 systems. Now, how do we do the same thing for passive
14 safety systems?

15 Well, if those systems aren't aligned when
16 you close out containment, well, they're not going to
17 be available for an entire cycle, and that's a bad
18 thing.

19 So, we can use that same inspection
20 procedure that's already written, which requires two
21 full walk-downs of, system walk-downs during a, during
22 a year, and usually during that containment walk-down,
23 and it doesn't require any extra inspection resources
24 to do that.

25 It's just, that's just going to be our

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1 sample for that particular effort. So, that's just
2 one example of how we'll use the current inspection
3 procedures to, you know, for that particular thing.
4 And I'll measure availability of passive safety
5 systems.

6 MR. CAMPBELL: And also, at power of
7 staffing, with the current fleet, the components are
8 outside containment, so they're accessible to
9 inspectors.

10 So, you don't really need to have the
11 amount of inspection, like resident inspectors onsite,
12 because those, that equipment isn't accessible on an
13 AP1000.

14 Whereas, on a conventional reactor, they
15 are accessible and you need to have more inspectors
16 look at them. So, there's a difference between what
17 we have.

18 We have the kind of leverage, what we have
19 now for inspection procedures, and whether those are
20 adequate now for the current operating fleet.

21 And then, you know, try and use that in
22 considering where the equipment's located, outside
23 containment or inside containment, and make your
24 decisions based on that.

25 So, the resources, we don't see as, like,

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1 the same number of residents being stationed at an
2 AP1000.

3 It's only when an outage occurs and they
4 can get into those areas where there's a higher
5 significant of passive components that we need to go
6 look at.

7 MR. MILLER: Yes. Let me, let me just
8 give a comment on that. And that, so, we're still,
9 we're still working that piece too as far as staffing,
10 and we're working Region 2, and we're working with
11 NRO, and we're working among ourselves for what the
12 staffing needs are.

13 I think we left it in the paper in the
14 version that you have, but put some, we put some words
15 in there saying that, you know, this is a, this is,
16 this is new technology, and you're rightfully
17 flagging, you know, some areas where we don't have all
18 the knowledge that we should.

19 We don't think we're going to, you know,
20 go through the first cycle with the same number of
21 inspectors that we might go through, you know, five
22 cycles down the road. So, we do intend to have some
23 additional staff looking at, certainly in a startup --

24 MR. CAMPBELL: Initially.

25 MR. MILLER: -- but also as we're walking

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1 through in the first, in the first cycle or two to
2 see, well, what is the right number?

3 How do we balance that, you know, outage
4 inspection versus how many samples we need to do
5 during a, during pre-outage, during the regular
6 operation? So, I'd say that's still an ongoing thing
7 that we're looking at.

8 CHAIRMAN SKILLMAN: I'd like to ask a
9 question here because I, I'm sensing a theme that I
10 had not sensed earlier of, in the comments that have
11 been made, it's clear in my mind that there is either
12 an aversion or a prohibition for at-power containment
13 entries.

14 And I worked at a plant where we made at-
15 power containment entries. We did not go into the
16 primary shield, but we certainly went into the
17 operating flat, and we had access to the reactor
18 building coolers, and to other equipment. And we made
19 routine visits.

20 So, what I'm hearing here, almost, is this
21 idea that, once you start up, you do not enter that
22 containment.

23 Is that an overwriting guideline for how
24 you're approaching inspections? And I would be quick
25 to point out, if it is, then I can recall a very

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1 powerful inspector from Region, from Region 1, whose
2 counsel was, shame on you. You would, you would not
3 go in a containment for a year? Shame on you.

4 You ought to go and touch the tags. You
5 don't have to stay long, and you don't have to get
6 exposed, but you ought to go take a look.

7 I thought that was wise counsel from one
8 of your best. It was an NRC inspector. And we did do
9 that at TMI1 routinely.

10 And so, I'm wondering if, for a few more
11 pieces of shielding, for choice of several routes,
12 there could be some actual inspections that ensure
13 that the safety systems we're talking about, RTNSS and
14 otherwise, are fit for duty.

15 MEMBER STETKAR: But, I'll just make, I
16 hear a lot about, well, we can't get inside the
17 containment and everything's inside the containment.

18 If I restrict my focus to safety-related
19 stuff, I'll call it that, then a lot of the safety-
20 related stuff on the AP1000 is inside the containment.

21 And on different new plant designs, all of
22 it is inside the containment. Safety-related stuff
23 might be squib valves, or it might be valves to
24 actuate the passive RHR heat exchangers.

25 Best that I can tell, almost all of the

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1 RTNSS stuff is outside the containment. I can go walk
2 and touch that stuff pretty much 365 days out of the
3 year.

4 So, this notion of, how am I balancing
5 inspections of RTNSS and safety-related, and what's
6 the scope of my inspections, and how much resources,
7 from what I read in the white paper, you do have a
8 target list of RTNSS stuff that will be included, at
9 least under the initial inspections, if not the
10 ongoing ROP. And all of that stuff is outside the
11 containment.

12 So, this notion about the fact that I
13 can't get to it and the inspections that I'm going to
14 be doing during an outage when I have that, you know,
15 hoard of characters inside the containment, we'll get
16 it done, doesn't --

17 MR. CAMPBELL: All samples --

18 MEMBER STETKAR: -- doesn't apply for the
19 RTNSS stuff, which I can take samples and go put my
20 hands on it and --

21 MR. CAMPBELL: All samples are, even
22 outside containment, we recognize RTNSS is outside
23 containment, and that would be included in the sample
24 population for inspection --

25 MEMBER STETKAR: And things like power

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1 supplies for squib valves and that sort of stuff is
2 all outside containment.

3 MR. CAMPBELL: Yes.

4 MEMBER STETKAR: Best as I can, you know,
5 there are wires that go through the containment.
6 Can't make penetrations, but that's all outside.

7 MR. CAMPBELL: We recognize there's still
8 going to be inspections outside containment. But we
9 know that the important passive ones are inside
10 containment.

11 CHAIRMAN SKILLMAN: So, are you at least
12 mentally prohibiting inspections of those?

13 MR. CAMPBELL: As an inspector, I would
14 take advantage whenever the licensee opened up
15 containment to enter.

16 I would take those opportunities during a
17 forced outage or if they needed, I actually went in
18 and, at ANO, and looked at a leaking valve with, at a
19 power entry, and I was gassed up in my lungs for about
20 a week.

21 You know, so, going in and, you have to
22 consider the health of the, and safety of the
23 inspectors and --

24 CHAIRMAN SKILLMAN: Well, I inspected --

25 MR. CAMPBELL: -- you know, going in

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1 there.

2 CHAIRMAN SKILLMAN: I understand that. I
3 mean, I've done those entries. I understand.

4 MR. CAMPBELL: But we have not considered
5 whether, would we, I'm kind of hearing, would we ask
6 the licensee for an AP1000 reactor to, permission to
7 go in at-power? Is that, is that what you're asking?
8 Is that what you're inquiring? That's --

9 CHAIRMAN SKILLMAN: I'm curious whether or
10 not you would expect them to go in and look at their
11 own equipment.

12 MR. GIBBS: May I? I'm a former operator
13 and I've made multiple at-power entries. That's, that
14 was part of the job.

15 As an inspector, I certainly wouldn't want
16 to do that. I didn't want to do it as a, as an
17 operator. So, of course, a licensee has the primary
18 responsibility for safety.

19 MR. CAMPBELL: Right.

20 MR. GIBBS: No question about that. I
21 think it would certainly be a, very much a change for
22 us to, I would characterize that as having an NRC
23 inspector go in containment for a routine inspection.

24 I don't believe that we're going to be
25 doing that. And I haven't, I haven't spoken with

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1 Steve about this particular issue.

2 However, having said that, if something
3 happens in, that we know about, in containment, then
4 we would, we would have to look at that on a case by
5 case basis.

6 But I suspect, because of ALARA, that we
7 would be biased towards not going in containment at
8 power, and that we would rely on the licensee to
9 provide us the information that we would need, such
10 that we could do our job. I don't know if that
11 addresses your thoughts about these inspections.

12 CHAIRMAN SKILLMAN: It does. And I'm
13 certainly not promoting at-power entries. But what I
14 would communicate is these new containments are well
15 built and they're well shielded, and there are areas
16 inside the containment that are, at background, as we
17 are right here right now.

18 And so, I think, now, one should not view
19 entering containment as a near death experience. One
20 can go in containment safely, dressed out safely, and
21 do so, ALARA, and accomplish a mission as long as it's
22 planned properly.

23 And so, if that's what it might take to
24 look at some of this equipment to ensure its
25 operability, I would say, okay. Maybe that's part of

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1 how the new plants are operated.

2 MR. MERZKE: I think in most cases, even
3 with the operating plants, if there's a containment
4 entry being done by the licensee for some reason,
5 generally, a resident inspector's going to accompany
6 him, or that person, as they, as they make that
7 containment entry.

8 A lot of times just to see, you know,
9 what's going on in there, if there are any leaks, and
10 to do that containment closeout and make sure it's
11 done properly.

12 CHAIRMAN SKILLMAN: But containment
13 closeout is a little different. I'm talking about an
14 at-power entry to go and inspect something.

15 MR. MERZKE: Well, I know. I'm just
16 saying, there, licensees do that on occasion, and I'm,
17 I mean, of the, some resident inspections actually
18 accompanied those licensees when they make those
19 containment entries.

20 CHAIRMAN SKILLMAN: Okay, let's move on.
21 I was just struck by what I thought was a theme here.
22 What I hear you say is, yes, sometimes it is
23 appropriate to make an at-power containment entry.
24 It's not normal and it's not necessarily championed,
25 but it's possible.

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1 MEMBER RAY: This is Harold. I want to
2 just point out that, in containment at-power is
3 different in AP1000 than the other plants you're
4 talking about because of the residual heat removal
5 function of the blow down to containment.

6 It doesn't mean you can't do it or
7 wouldn't do it. I don't know what the status of that
8 is, but it's different anyway.

9 CHAIRMAN SKILLMAN: Okay. Thank you,
10 Harold. Let's proceed. Go ahead.

11 MR. CAMPBELL: I'm done, Daniel.

12 MR. MERZKE: I guess, sorry, I guess that
13 wraps up the inspection procedure portion, and we'll
14 be moving on to the significance determination
15 process.

16 MR. GIBBS: Good afternoon, everyone.
17 Thank you for listening to us, and we appreciate what
18 you have to say.

19 And I think I heard something in, a moment
20 ago said, at the risk of being provocative, well, I
21 like being provocative.

22 I think it helps us, helps us understand
23 what we're doing and actually has a, you know, have,
24 maybe ask ourselves questions that we haven't thought
25 about.

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1 So, I think we, I can speak for everyone
2 to say that we appreciate what you, what you have to
3 say here today. I'm Russell Gibbs. I'm a senior
4 reactor operations engineer in the Division of
5 Inspection and Regional Support.

6 Dan and I work in the same division. I am
7 the program lead for the Agency on the significance
8 determination process.

9 Not just for those that are more, you
10 know, associated with PRA or probabilistic risk
11 assessment, but also those that are more deterministic
12 in nature.

13 So, I'm the Agency's lead for all seven
14 cornerstones, and we have some representatives here
15 today in some of these various cornerstones. And I'm
16 joined by See-Meng Wong, who is in our Division of
17 Risk Assessment.

18 See-Meng and I work very closely together
19 in terms of our program and its successful
20 implementation. And Matt Leech is also here today to
21 talk about one of our procedures.

22 I wanted to reflect on a couple things
23 about the SDP in general. And just to, just to make
24 sure we all are on the same page about what the SDP's
25 trying to do.

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1 And of course, reflecting on our
2 principles of good regulation, the SDP needs to be
3 reliable.

4 It needs to be as good as it can be, but
5 at the same time, it needs to be efficient. And so,
6 why, you know, this, so, this balance between
7 reliability, us getting it right, and us doing it in
8 an efficient way is something that we have to balance
9 in our program.

10 And it's very important that we get that
11 sweet spot right, because of course, our decisions
12 have, can have significant implications for licensees.

13 But you know, we also need to make these decisions in
14 a timely manner.

15 Now, it's important that we do it in a
16 timely manner for, one reason is that we need to make
17 sure we know what we need to do to follow up.

18 And we need to, for example, if a, if an
19 inspection finding is greater than green, we need to
20 conduct that follow up inspection in a timely manner
21 to make sure the licensee's taking the right action.

22 The second thing, and some people
23 oftentimes forget this part of the SDP, and that is,
24 we need to be timely such that we can be in step with
25 the assessment process.

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1 The assessment process is done quarterly,
2 semi-annually, and on an annual basis. So, if our
3 decisions are not in step with the assessment process,
4 then we have to wonder, are we being relevant with
5 respect to our decision making in the overall course
6 of understanding overall licensee performance.

7 And then thirdly, we have an obligation to
8 inform the public about licensee performance. So, I
9 say that because it's, again, it's striking of this
10 balance between reliability and efficiency.

11 And so, we try to do that when we develop
12 our program, and we have to be mindful of that. Okay.

13 With that, slide, next slide, please.

14 MEMBER POWERS: You've made, of course, a
15 very important point here of the balance --

16 MR. GIBBS: Yes.

17 MEMBER POWERS: -- that we have to get
18 there. How are you doing?

19 MEMBER POWERS: I, you know, that's, this
20 is something we're looking at currently. We have, I
21 believe, and many of the folks involved in the
22 significance determination process here in the room,
23 it's a good, a very good program, but I will tell you,
24 we think we could improve.

25 MEMBER POWERS: Yes. There's certainly

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1 horror stories about SDPs taking a long time.

2 MR. GIBBS: Right.

3 MEMBER POWERS: And you know, that, when
4 the ROP was first set up, we, everybody said, what
5 else do you, tell me something else that's new because
6 it was new. But I wondered how it was doing now that
7 we've had some substantial experience with it.

8 Now, of course that's complicated because
9 the risk assessment tools that you have keep getting
10 newer and better and --

11 MR. GIBBS: Right.

12 MEMBER POWERS: -- more complex.

13 MR. GIBBS: Exactly.

14 MEMBER POWERS: And your expertise, which,
15 by the way, in my experience, the guys that's doing it
16 are really outstanding.

17 And, but they want to do more sensitivity,
18 how close, or were we near cliffs? Is there something
19 here more?

20 And they're always looking to do more and
21 more and more with it. I wondered if you tracked and
22 just how well are you doing on making this balance?

23 MR. GIBBS: Right. Let me, let me offer
24 you a bit of data to help you, to help you appreciate
25 how we've been, how we've done.

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1 And I would agree with you, our tools,
2 over the years, have got, have improved. Our staff
3 has become actually quite sophisticated --

4 MEMBER POWERS: They are, they absolutely
5 are.

6 MR. GIBBS: -- with respect to how we go
7 about performing these risk calculations for the
8 initiating events, mitigating systems, and barrier
9 integrity cornerstones.

10 So, there's an initiative underway that
11 was actually started as part of Commission direction
12 to streamline the significance determination process.

13 That was actually started as a result of a
14 specific SDP that took us over a year. In fact, it
15 took us about a year and a half to make a decision.
16 This is the Arkansas Nuclear One.

17 And so, since that time, what we've been
18 doing is we've been looking at our program to identify
19 ways that we can become more efficient, keeping the
20 reliability. We want to get it right. But how can we
21 do this work in less time?

22 And so, the streamlining initiative is now
23 part of what we're calling inspection finding
24 resolution management.

25 The data that I would offer to you is, as

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1 we looked in the past, about 30 percent of the time we
2 reached, that we made a decision for a greater than
3 green inspection finding, it took us over a year.

4 About 40 percent of the time, it took us
5 over eight and a half months. And so, we stepped back
6 from that, and we said, we can do better.

7 And so, what we're doing now, we're in a
8 trial period to identify ways that we can actually
9 improve our performance.

10 And you know, I'm happy to tell you that
11 from the, from the, now, we're in about the eighth
12 month of this trial period, our performance is
13 improving.

14 And the one reason is for improving,
15 mainly, I suspect, is one, we have better, we're
16 seeing better management oversight of the work that
17 the staff is doing.

18 But two, really important, is that the
19 front end of the whole inspection and SDP, we have
20 established a trial period, a metric, of 120 days.

21 And so, that metric is, once we become,
22 once we become aware of an issue of concern, we're
23 looking at about 120 days to make some kind of
24 decision and inform the licensee with a formal exit
25 meeting. In the past, we had no metric for that.

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1 And so, that one metric is really helping
2 us in combination with improved management oversight
3 of these greater than green issues. I hope that, I
4 hope that explains --

5 MEMBER POWERS: Well, I mean, that's of
6 course the step to take. There's another step is, are
7 you asking, especially your analysts themselves, are
8 the tools adequate for the chore, the task you have,
9 or are there things that would make it possible to
10 take that 120 days and turn it into 60 days if the
11 tools --

12 MR. GIBBS: Right.

13 MEMBER POWERS: -- were improved?

14 MR. GIBBS: Okay. So, if the 120 days is
15 about inspection.

16 MEMBER POWERS: Yes.

17 MR. GIBBS: That's an inspection focus.
18 With respect to the significance determination process
19 and time, we believe the current SPAR models are very
20 good in helping us assess the delta core damage
21 frequency, or the change in risk from the baseline
22 risk.

23 We believe those tools are really good.
24 Sometimes though, where we get into some inefficiency
25 is when we try to use those tools in situations that

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1 they're not really meant to be used for.

2 I think we talked about early, about
3 external flooding. We tried our very best in the past
4 to, if you will, quantify external hazards from a,
5 from a significance standpoint.

6 MEMBER POWERS: I see what you're saying.

7 MR. GIBBS: And then, we would go back and
8 realize that, you know, this is not really helping us.

9 So, we would use this Appendix M approach, which is a
10 more qualitative approach to assessing the
11 significance.

12 MEMBER POWERS: You know, you're talking
13 to the people developing the codes and saying, look,
14 this is a problem I had. I was using your tool in the
15 wrong place and I had to resort to something else. It
16 would really be nice if I could just use the tool.

17 MR. GIBBS: Correct. Exactly. And that's
18 exactly what we're doing right now to help us improve
19 our performance.

20 And we're very, I think we're very hopeful
21 about where this is going to take us over the next
22 months.

23 MEMBER REMPE: So, have your discussions
24 led to a user need or how far are those discussions
25 going? Because, I mean, not much gets done unless you

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1 have a user need, right?

2 MR. GIBBS: No. Not, no. That's, we
3 haven't a user need with respect to reaching out to --

4 MEMBER REMPE: The tools are inadequate
5 and something else needs to be done?

6 MR. GIBBS: Okay. So, the tools
7 themselves is an ongoing initiative with the SPAR
8 models through Idaho National Lab, they are the ones
9 that develop these tools, the SPAR models.

10 MEMBER REMPE: Right, I know.

11 MR. GIBBS: And then, we have, for
12 example, See-Meng Wong here is the lead staff member
13 in the Division of Risk Assessment to help with that,
14 working with the Office of Research. So, that is an
15 ongoing project every year.

16 MEMBER REMPE: So, it's a, I don't know.
17 It's a base interaction, so you don't have to have a
18 user need --

19 MR. GIBBS: Correct.

20 MEMBER REMPE: -- is what you're telling
21 me. But if you're trying to go beyond the maintenance
22 of the codes and you want a new model, that's still
23 covered by it too?

24 MR. GIBBS: For example, if we wanted
25 shutdown risk models that we currently don't have --

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1 MEMBER REMPE: Right.

2 MR. GIBBS: -- we would have to have a
3 very concerted effort to develop those models,
4 recognizing that very few licensees have shutdown
5 models. But yes, we would have --

6 MEMBER REMPE: Then you would have to have
7 a user need.

8 MR. GIBBS: Absolutely.

9 MEMBER REMPE: Or if you wanted, what
10 about if you want to try and expand them for
11 evaluating them, FLEX strategies? Is that covered by
12 your base --

13 MR. GIBBS: I believe --

14 MEMBER REMPE: -- allocation?

15 MR. GIBBS: -- that would actually be
16 covered by the base, but See-Meng Wong, you might want
17 to --

18 MR. WONG: Okay.

19 MR. GIBBS: -- comment.

20 MR. WONG: If I may, in response to your
21 question, ma'am, we talked about this question. We do
22 have a continuing user need to our colleagues in the
23 Office of Nuclear Regulatory Research.

24 It's a multi-year program where we
25 indicate to our RVS colleagues to provide support to,

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1 on an ongoing basis.

2 In fact, a 24/7 kind of a support. Not
3 only to maintain and enhance the SPAR models to assure
4 the fidelity of the SPAR models when we know that
5 there are modifications or changes and all that is
6 going on.

7 The ongoing user need has also very
8 specific tasks that we ask our folks to improve the,
9 especially in the methods in the PRE technology and so
10 on.

11 So, we do have in place this mechanism and
12 this vehicle to ensure that our tools that we use to
13 support the implementation of the ROP and SDP process
14 is continuously improved.

15 Another thing I want to add is that, to
16 make our risk analysts and our senior reactor
17 analysts, which is really the core of individuals in
18 the Agency who process the issues using the
19 significance determination process tools, we have in
20 place, and I believe there was a presentation on a,
21 what we call a risk assessment standardization project
22 handbook, which is a codification of best practices of
23 our experience in SDP, MDA.3, and the accident
24 sequence precursor program.

25 So, and these handbooks, there are four

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1 volumes, Volume 1, 2, 3, and 4, that address internal
2 event risk assessments. Volume 2, external event risk
3 assessment methods and guidance.

4 Volume 3 is a, sort of a very detailed
5 SPAR model, kind of an execution manipulation that
6 gives guidance to the analysts. And then, Volume 4
7 is, address for shutdown risk assessment.

8 So, these, in relation to the tools that
9 we have, we have a document in place, and also our
10 continuous effort, as Russell's mentioned earlier, the
11 ROP, SDP is a living program.

12 We continuously upgrade and improve our
13 MIC guidance documents in addition to your last
14 handbook where we do engage the external stakeholders
15 to seek their views as we try to keep improving the
16 way on how we process our inspection findings more
17 efficiently, and so that, just kind of a knowledge
18 management tool in place. That's, does that answer
19 your question?

20 MEMBER POWERS: Well, it's excellent. I
21 mean, I'm glad everything's on, but I think Russell's
22 hit upon a key that we need to make sure these people
23 providing you the tools understand the metrics you're
24 imposing on your own activities so that they
25 understand what you're trying to achieve.

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1 Otherwise, they end up playing in a
2 sandbox a lot because they need to set their own
3 metrics and performance goals and things like that.

4 So, yes, I think you've hit upon a
5 strategy, and I'll be delighted to hear how this comes
6 out as you go through your trial period and as you
7 extend these metrics and what you'd like, what's your
8 goals, your stretch goals and things like that, and
9 communicate it to people providing your tools.

10 Because I think there's opportunity, they
11 have to proceed kind of blind because they don't know
12 what you're trying to achieve.

13 And that communication, which has already
14 started, as Mr. Wong pointed out, that you're, you've
15 got ongoing dialogue with them.

16 MR. GIBBS: We absolutely do.

17 MEMBER POWERS: And --

18 MR. GIBBS: And in fact, the risk, the
19 risk analyst community is no fault.

20 MEMBER POWERS: But I know this for a fact
21 --

22 MR. GIBBS: Right.

23 MEMBER POWERS: -- I mean, myself, but I
24 think you've hit upon a tactic that actually helps
25 them when they understand what you're trying to

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1 achieve.

2 MR. GIBBS: Yes. Bingo.

3 MEMBER POWERS: Yes. Yes.

4 MR. GIBBS: You got it right, as far as
5 I'm concerned. Okay, yes, indeed, we have been
6 engaged with the risk community.

7 They know exactly what we're trying to do
8 and why we're trying to do it. And so, this is over a
9 two year process, and we're, again, we're hopeful for
10 the outcomes.

11 MEMBER POWERS: Well, I hope that you will
12 take the initiative to ask to come to us again and
13 talk to, once you've had a chance to digest what your
14 two year process has led to.

15 MR. GIBBS: I would be happy to do that.

16 MEMBER POWERS: And how you, because I
17 don't think it ends. I mean, in two years, I think
18 that's where you're getting your feet wet --

19 MR. GIBBS: Yes.

20 MEMBER POWERS: -- and what you can do to
21 go in for a full swim here.

22 MR. GIBBS: Indeed, it's a living program.

23 MEMBER POWERS: And because this is really
24 the key to success on a lot of this ROP, is
25 understanding well, where the resources should be

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1 focused and not trying to inspect every damn thing in
2 the world.

3 MR. GIBBS: And knowing when to spend how
4 much time on assessing a performance deficiency and
5 its significance, how much time is appropriate?

6 MEMBER POWERS: That's right.

7 MR. GIBBS: That's what we're trying to
8 do.

9 MEMBER POWERS: Because the Agency does
10 not have infinite resources --

11 MR. GIBBS: Correct.

12 MEMBER POWERS: -- nor does the licensee.

13 MR. GIBBS: Correct. Okay. If, any other
14 thoughts about that, we'll continue.

15 MEMBER REMPE: Oh, okay. So, a few weeks
16 ago, we were at a meeting and I remember one of my
17 esteemed colleagues making a comment about a lot of
18 resources were going to get a fifth significant figure
19 out of a SPAR model.

20 And again, I think what Dr. Powers is
21 saying could be really honed in if there's some
22 significant, I mean, maybe that user need ought to be
23 really focused on trying to make sure that you're
24 getting the bang from your bucks to have some process
25 improvements and efficiencies.

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1 And so, that would be something that would
2 be good to see coming out of some of these
3 discussions.

4 MR. GIBBS: I appreciate that. In fact,
5 you know, early on in the SDP, I remember a letter
6 that we were sending to the licensee about the
7 significance of an inspection finding, and I believe
8 it had four to five significant digits in the, in the
9 risk estimate.

10 And all of you, of course, know that that
11 is not helpful when describing the significance of a
12 performance deficiency.

13 And so, that was many, many years ago, and
14 can assure you that now we have, we have, we are
15 improving, have improved greatly with respect to
16 understanding really that point estimate or that
17 change in risk from the baseline risk. Really, the,
18 you know, the perspective of what that number really
19 means.

20 In fact, we're taking that further in our
21 decision making process by doing a number of things,
22 such as conducting training for our decision makers
23 about what is a PRA and how to go about making an
24 effective and efficient decision in the SDP process.

25 MEMBER POWERS: Boy, is that music to the

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1 former Commissioner Apostolakis' ears --

2 (Laughter)

3 MEMBER POWERS: -- because, I mean, he was
4 really concerned about decision making --

5 MR. GIBBS: Right.

6 MEMBER POWERS: -- in a risk-informed
7 context. And again, that would be, that's a whole new
8 subject for this crew to come talk to us about is
9 decision making in a risk-informed context.

10 MR. GIBBS: So, the findings --

11 MEMBER POWERS: I don't know how to do it.

12 (Laughter)

13 MR. GIBBS: Well, right. Thank you for
14 your, for your comment. I appreciate that.

15 MEMBER REMPE: He started it.

16 MR. GIBBS: And all, both of you. So, the
17 SDP for new reactors, I'll just, you know, the bottom
18 line here is, you know, we don't see much change
19 needed, and those are the procedures in the second
20 bullet there that we believe need to be changed.

21 So, we'll, let's get into some more of
22 that detail. Let's go to the next slide. Of course,
23 the background on this, as has been mentioned a number
24 of times today, we received, I believe, some very good
25 direction from the Commission, and that is addressing

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1 these circumstances, and this has come up today, that
2 are unique to new reactors.

3 Uncertainty of, or uncertainty of
4 reliability of passive systems, structure systems and
5 components, or those SSCs with limited operational
6 experience.

7 This is specific direction from the
8 Commission, and we've actually talked about that in
9 our discussion today. So, that, I thought that was a
10 very good dialogue to sort of tee up this discussion.

11 And then, as I pointed out earlier, the
12 Commission, I believe, was smart to tell us that we
13 needed a structured qualitative framework as well for
14 certain events or conditions that are not evaluated in
15 supporting risk models.

16 I think what that's saying is, if there
17 are situations that there are no risk models
18 available.

19 And let me, let me make a comment back
20 again to the SDP. The program itself, it really
21 encourages the staff to use the best available
22 information in the process.

23 Using best available information help,
24 enables us to make our decisions in a more timely way.

25 Again, balancing reliability and efficiency in that

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1 regard.

2 And so, I'll talk a little bit about what
3 we're doing to address these specific, these specific
4 direction. But importantly, is that we continue to
5 place emphasis on the quantitative approaches.

6 So, if there are risk models that we can
7 use, we should use them, and we should try to, we
8 should try to produce a quantitative result.

9 And why is that so important? Because
10 quantitative results, in their proper perspective, are
11 objective, and they are repeatable.

12 And that's very important with respect to
13 the reactor oversight process as we interact with
14 licensees. Such that, we, the dialogue that we have
15 licensees on performance deficiencies, that we're both
16 on the same page, if you will, about understanding the
17 significance of any given performance deficiency.

18 So, this is, this is the specific
19 direction provided by the Commission, and we certainly
20 believe it's appropriate. The next slide, please.

21 So, you know, I was reflecting on our
22 discussions about the same safety expectations, and
23 that whole, that whole discussion that we were having
24 about the SRM SECY 10-0121, and reflecting on the
25 current SDP.

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1 And would the SDP change dramatically if,
2 indeed, the Commission adopted, you know, a lower
3 threshold, if you will, for new reactors? And
4 honestly, I don't think it would.

5 I think the program itself is very robust
6 indeed. And it, but of course, we would have to make
7 some changes with respect to some calculations and
8 outcomes of those calculations.

9 But, so, as I'm looking at the program,
10 and that, you know, and that third item there, the
11 existing program is very robust.

12 In fact, I counted up, I counted all the
13 SDP documents, and not to say that numbers are, should
14 impress you, but we have 34 SDP-related manual
15 chapters.

16 Now, that includes very specific guidance
17 for the various cornerstones. But also includes our
18 program guidance as well.

19 And so, that's a, that's a, that's, that's
20 a fairly large program. And some of our SDPs are very
21 specific.

22 For example, there's an SDP for steam
23 generator 2 rupture. There's an SDP for containment.

24 There's an SDP, as Jeff Mitman pointed out earlier,
25 for shutdown. There's an SDP for at-power, et cetera.

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1 And there are SDPs for emergency
2 preparedness, security, radiation protection. So,
3 it's a very robust program, and so, we're continuing
4 to evaluate how we might, how we might change that
5 program. And that's exactly what we did.

6 CHAIRMAN SKILLMAN: Russ, let me jump in
7 here --

8 MR. GIBBS: Sure.

9 CHAIRMAN SKILLMAN: -- because the comment
10 that I want to make is precisely in this area of
11 specificity of the SDPs. From your white paper, just
12 let me read a sentence, and then I'll make my comment.

13 In your white paper, you write, and this
14 is on page, it's under significance determination
15 process. It's the end of the second paragraph.

16 The necessary modifications include new
17 screening questions for the safety cornerstones of
18 initiating events, mitigating systems of varied
19 integrity, as well as addressing findings associated
20 with the reliability of passive SSCs, digital
21 instrumentation and control, and human performance
22 issues uniquely associated with operational practices
23 in gen 3 reactor designs.

24 So, my rhetorical question is, what about
25 passive physical functions credited in the license?

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1 For example, now, you just mentioned 34 SDPs.

2 My thought is, there needs to be a
3 significance determination process that is designed
4 around assessing the significance of the failure of a
5 physical condition.

6 For instance, the containment surface,
7 heat transfer, cleanliness. For instance, the ability
8 of the water tank valve to be, for certain, open when
9 commanded.

10 It's not too different than flight time
11 testing for a control rod. You're not really looking
12 at the rod, you're looking at the tech spec
13 requirement for 90, 95 percent inserted in 2.2
14 seconds. You're looking at the function, not the
15 device.

16 So, what I'm, what I'm suggesting and
17 challenging you with is the notion that because the
18 passive designs are crediting passive features,
19 passive functions, thermal hydraulic features, other
20 such features that are really not devices.

21 They're actually physical conditions.
22 That your SDP should have the capability and perhaps
23 the guidance to assess the significance when that,
24 when that physical phenomenon doesn't do what it's
25 supposed to do, much like when the flight time test

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1 comes out four seconds to 100 percent insert when it
2 should've been 2.2. Right?

3 At that point, you're saying, you know, we
4 know the rod's stuck or there's something going on,
5 but what we're monitoring is the time, not the device.

6 I would suggest that you are actually
7 going to need to monitor a physical phenomenon, and it
8 is as important in the passive design as SSCs are in
9 the active design.

10 MR. GIBBS: Okay. So, and thank you for
11 that. I want to make sure I get that. And I see See-
12 Meng Wong is writing very quickly over here.

13 (Laughter)

14 CHAIRMAN SKILLMAN: I hope I'm not being
15 confusing.

16 MR. GIBBS: No, no, no. No, you're not.
17 And so, what we're trying to do in using the current
18 framework, what we'd like to do as best as we can, and
19 as efficiently and reliability as we can, as we look
20 at a degraded position caused by a licensee
21 performance deficiency, and we try to make a
22 determination if it is a very low safety significance.

23 In other words, does it screen to green?
24 That's the first step after we have what we call an
25 inspection finding.

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1 And so, See-Meng is going to talk about
2 manual Chapter 6 and 9, Appendix A, which is the at-
3 power SDP.

4 We will also talk about Appendix G, which
5 is the low power and shutdown. Matt will speak to
6 that.

7 And so, what our challenge is, is to, is
8 to design a screening question that would actually
9 take into account what you just said.

10 But keep in mind that the program, if the
11 function itself is not lost, and consistent with other
12 aspects of our program, that would screen to green.
13 That's the way our current program is now.

14 However, if the function is lost, and by
15 the way, as I mentioned earlier, if we lose function
16 of these passive systems, this could be a very
17 significant inspection finding.

18 CHAIRMAN SKILLMAN: Well, see, it's not
19 just loss of the passive system, it can be compromise
20 of the physical feature on which --

21 MR. GIBBS: Sorry.

22 CHAIRMAN SKILLMAN: -- the phenomenon
23 depends.

24 MR. GIBBS: Degraded, if you will?

25 CHAIRMAN SKILLMAN: Yes, it could be.

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1 MR. GIBBS: Right.

2 CHAIRMAN SKILLMAN: A three percent
3 degradation in heat transfer could result in failure
4 in your ECCS performance.

5 MR. GIBBS: Right. Right.

6 CHAIRMAN SKILLMAN: It could be just as
7 subtle as subtle can be, and unless there's a change
8 in the SDP process to have a magnifying glass that's
9 thick enough to recognize that, it'll get lost.

10 MR. GIBBS: So, when we get to Appendix A,
11 maybe you can address that further. But we
12 understand. I believe that we understand what you're
13 talking about.

14 And it's a matter of the level of detail
15 that you would need in your tool to understand the
16 change in risk, not just from it being lost, but from
17 it being degraded.

18 CHAIRMAN SKILLMAN: Compromised.

19 MR. GIBBS: Compromised in some way.

20 CHAIRMAN SKILLMAN: Yes.

21 MR. GIBBS: Correct.

22 CHAIRMAN SKILLMAN: That's the point I'm
23 trying to make.

24 MR. GIBBS: Yes, yes, yes.

25 CHAIRMAN SKILLMAN: And I'm trying to say,

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1 it can be very subtle.

2 MR. GIBBS: Yes.

3 CHAIRMAN SKILLMAN: For instance, in a
4 passive design where you're depending on the siphoning
5 factor, thermal density, it could, it could require
6 that there needs to be a manometer.

7 It will tell you, you still have an inch
8 and a half head driving end. But that's not a whole
9 lot of driving head, but it may be enough to prevent
10 from having a LOCA, or prevent from having --

11 MR. GIBBS: Right.

12 CHAIRMAN SKILLMAN: -- fuel damage. What
13 I'm trying to say, as we move into this realm of
14 passive features, the sensitivity of those, the
15 failure of success, becomes very important. And
16 unless the SDP is kind of looking at it that way, it
17 might miss it.

18 MR. GIBBS: Well, you know, the SDP does
19 rely, in many ways, on the licensee's rigor, if you
20 will, in determining operability of a, of a structured
21 system or a component, most of which we would be
22 saying here are structures, I suspect.

23 CHAIRMAN SKILLMAN: Well, you're saying
24 structured system component, and I'm resisting that,
25 because I think it's structure system component and

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1 passive phenomenon, about passive phenomenon.

2 MR. GIBBS: Right, right, right. And does
3 that passive phenomenon actually cause, have an effect
4 on the structure system or component?

5 CHAIRMAN SKILLMAN: Well, it certainly
6 carries the day for ECCS in the AP1000.

7 MR. GIBBS: Right, right, right.

8 CHAIRMAN SKILLMAN: It's the heat transfer
9 into the building.

10 MR. GIBBS: Right. Okay.

11 CHAIRMAN SKILLMAN: In the surface of the
12 building.

13 MR. GIBBS: We noted that.

14 CHAIRMAN SKILLMAN: Thank you.

15 MR. GIBBS: We appreciate that.

16 CHAIRMAN SKILLMAN: Okay, okay.

17 MR. GIBBS: Okay? Okay. So, you know,
18 again, we looked at every SDP. We have inspect, we
19 have leads for every SDP that we have, and a gap
20 analysis was done.

21 And as it turns out, because the SDP is
22 essentially design neutral, design neutral, we, we're
23 not, we don't believe we need to make many changes.

24 For example, the deterministic SDPs, the
25 SDP for emergency preparedness, Appendix Bravo, the

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SDPs for radiation protection, both worker and public.

Appendices Charlie and Delta, the Appendix for security, Appendix Echo. We looked at those and we don't believe any changes are needed as the basis we're providing in the document we provided to you. But in general, it's a design neutral consideration.

Now, we also looked at SDPs for fire, which is manual Chapter 6 and 9, Appendix F. Operator re-qualification, which is Appendix I or Indigo, steam generator 2 rupture, maintenance rule, B5(b) and mitigating strategies.

We believe that none of those SDPs are going to require revision for new reactors. However, in looking and doing this gap analysis, we do believe the at-power, as you point out, possibly for passive structures, the SDP for at-power, Appendix A, the SDP for shutdown, Appendix G, and that for containment.

And then finally, and a very important SDP we use for qualitative considers, Appendix M, we believe all four of those documents will require revision for new reactors.

And we're going to give you some more detail in that regard in just a moment. Next slide, please.

So, I'm going to turn this over to See-

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1 Meng. He's going to talk to you a little bit about
2 Appendix A and Appendix M, and then, and then Matt
3 will follow with Appendices G and H. See-Meng?

4 MR. WONG: Okay. Thank you, Russ. Good
5 afternoon. My name is See-Meng Wong and I work in the
6 NRR Division of Risk Assessment.

7 I'm a senior reactor analyst, and I've
8 been in this business I think since the implementation
9 of the ROP, providing support in the development of
10 some of the SDP tools, as we have it today for the
11 current operating fleet, as well as some of the
12 specific SDPs like Appendix F, Appendix M.

13 So, that's the experience that Russ has,
14 all his division has assigned me to work on to develop
15 or improve the SDP tools that we have to customize it
16 to accommodate the AP1000 design, or the new reactor
17 designs.

18 So, as Mr. Skillman, that you've
19 commented, just very, very clearly, very specific
20 features in the AP1000 design and the new reactor
21 designs that we have to have a greater understanding
22 to make sure that findings or issues, when the plant
23 is in operation, that we have a good microscope.

24 So, this, as a step back, the IMC 0609,
25 Appendix A, is really our framework and guidance to

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1 screen what we call at-power inspection findings. And
2 then, directing the user to other applicable SDP
3 appendixes, in case for specific areas.

4 For example, if it's a fire issue, fire
5 brigade issue, we have got specific direction to say,
6 please proceed to go to that specific appendix.

7 And then, and if it filters through what
8 we call the screening process, which we consider it to
9 be the central foundation for the Appendix A to
10 perform a detailed risk evaluation if the issue is
11 screened greater than green.

12 So, what we have today in the Appendix A
13 framework, so to speak, is that we have a Phase 1
14 screening process.

15 And the Phase 1 screening process will
16 look at the various cornerstones, initiating event,
17 mitigating systems, barrier integrity, and external
18 events.

19 And so, your finding is identified, and
20 so, the inspectors, and more often than not, the
21 inspectors, once a performance deficiency has been
22 identified, will work with the senior reactor analysts
23 at our regional offices to process it to determine
24 whether that issue is screened to a low risk
25 significance issue.

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1 So, that's a logic that we apply, kind of
2 a systematic logic. So, if it is looking at a
3 degraded condition, there are filters. Okay?

4 There are what we call simple logical or
5 illogical and questions or conditions, so, like Mr.
6 Skillman said, if there is an issue, a particular
7 issue that you are talking about where, I don't
8 remember, but one example I can think of, for example,
9 containment coating.

10 CHAIRMAN SKILLMAN: It's a physical
11 phenomenon.

12 MR. WONG: Physical phenomenon.

13 CHAIRMAN SKILLMAN: I'm trying to, I'm
14 trying to reinforce this notion. We talk about
15 structure systems and components.

16 MR. WONG: Right.

17 CHAIRMAN SKILLMAN: That's dandy for
18 active plants. The passive plants are depending upon
19 physical phenomenon, not necessarily the components.

20 MR. WONG: Correct.

21 CHAIRMAN SKILLMAN: And so, it seems to me
22 that that is a, that is a flag that needs to be
23 recognized in the ROP.

24 MR. WONG: Yes. So --

25 MEMBER RAY: This is Harold. Do you think

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1 it needs to be recognized in the ROP primarily, or in
2 the required surveillance testing, which is what I
3 keep thinking you're talking about?

4 CHAIRMAN SKILLMAN: I think it's both. It
5 needs to be recognized in the surveillance testing,
6 but the --

7 MEMBER RAY: Well, if it, if it's in the
8 surveillance testing, then the ROP is, for sure, going
9 to pick it up.

10 As a long-term licensee, and I know you
11 were too, I just don't like to think about
12 requirements being imposed as the oversight process.

13 CHAIRMAN SKILLMAN: Fair enough. I
14 understand your comment.

15 MR. WONG: Yes. Thank you very much. So,
16 in looking at what we have for the operating fleets
17 SDP for Appendix A at-power, so, the one big change
18 that we are going to be going forward would be a new
19 set of screening questions to help us to screen the
20 issues, whether it is going to be green or greater
21 than green, or to other specific SDPs.

22 So, the areas that we're looking for is,
23 again, as mentioned, the passive SSCs, and also the
24 physical phenomena issues that is being discovered.

25 In addition, we will design screening

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1 questions to screen out issues related to, for
2 example, systems that have got limited operating
3 experience.

4 One thing that comes to mind is the
5 digital I&C systems that is going to be as part of the
6 AP1000 design or the new reactor design.

7 The other area that we think that we need
8 to put our eyes on is human performance issues.
9 Potential loss of command and control issues may come
10 up. We may not know, but is this something that we
11 need to look at?

12 And finally, there are indices that got,
13 and he may have addressed your question, that has got
14 plant-wide implications or effects.

15 For example, cabling issues, okay? We
16 have an example, for example, in Oconee, we have got
17 cable issues where, you know, that were installed, and
18 we, it is this type of issues that we need to find a
19 way to design the system that we can screen it out,
20 you know, that if we don't have a risk model or we
21 don't have a supporting risk model as the SRM has
22 indicated, then we would specifically direct the
23 analysts and, or the management panel reviewing it to
24 go to Appendix M. Okay?

25 MR. GIBBS: Well, to say that differently,

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1 to go to a qualitative structure.

2 MR. WONG: Qualitative structure.

3 MR. GIBBS: It just so happens that
4 Appendix M is the current framework for that
5 structure, just to be clear.

6 MR. WONG: So, I will pause here for any
7 questions before I go to the more exciting SDP.

8 CHAIRMAN SKILLMAN: Please continue --

9 MR. WONG: Oh, okay.

10 CHAIRMAN SKILLMAN: -- See-Meng. Please.

11 MR. WONG: All right. Fifth, the next SDP
12 to, that we currently have in the books is what we
13 call an IMC 0609 Appendix M. It's decision making
14 using qualitative criteria.

15 Now, as I've looked back at the SRM to,
16 the Commission SRM to SECY 13-0137, and just to make
17 sure that we understand what the Commission direction,
18 I also went back and looked at the voting records that
19 the Commission has provided, as to their
20 recommendation.

21 And so, I need to add that Commissioner
22 Apostolakis was the lead commenter in circle,
23 providing the direction.

24 So, and that direction is that, and in my
25 slide is, I will quote directly, and it is quoted

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1 throughout the voting record is that, the Appendix M
2 should be a structured qualitative assessment for,
3 they say events, but more so for degraded conditions,
4 that are not evaluated in supporting risk models.

5 So, my understanding, and interpretation,
6 is that we should look for a way to use qualitative
7 factors to assess issues that is beyond the capability
8 of, say, a PRA model where most of our SDP tools today
9 are very, what I call, PRA-centric.

10 That means it's got a PRA framework that
11 leads ones through to make, you know, a quantitative
12 outcome. So, that's how I read into it.

13 So, following through to that direction,
14 this is what we are proceeding in our activity to try
15 to develop this Appendix M, and provide the Commission
16 as one of the options to answer the question of having
17 a tool that can support assessing findings for the new
18 reactors. Okay?

19 So, if you were to read in the SRM, there
20 is also a kind of an additional direction. I call it
21 a separate initiative to provide clarity on the use of
22 the qualitative factors for upgrading reactors,
23 because under the current, for the current operating
24 fleet, our Appendix M is a very short, is only a four-
25 page guidance that is, that has been established to

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1 allow the analyst or the senior analyst, when they use
2 it, only in very, very specific entry conditions for
3 situations where there's no PRA model.

4 For example, issues that's related to
5 reactor management, you know, spent fuel pool
6 reactivity issues. Okay?

7 Or there was one entry condition where the
8 PRA process, the assumptions that go into the
9 quantitative SDP tools has a lot of uncertainty that
10 gives the, you know, the calculation is going to take
11 a long, long time. Okay?

12 So, you've heard previously, Russ
13 mentioned, with regard to our current use of the
14 Appendix M.

15 So, over the past, since 2006, with the
16 current Appendix M, there's been 20 issues that has
17 been processed with Appendix M.

18 And in that database, there, a few
19 examples were related to flooding issues, some pre-
20 Fukushima, some post-Fukushima.

21 But in those issues, a lot of effort was
22 initially undertaken to try to find out, you know,
23 what is the best available data to use to define or to
24 establish the flood frequency, you know, 20 year
25 versus 1,000 year rainfall data, which one is better.

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1 But that kind of analysis is what is
2 causing some of the comments that we're having of
3 concerns that it's taking a lot, long, long time.

4 So, where all this is going to is that
5 Russ and I, we're working to try to come up with
6 better ways, and if Appendix M is one potential option
7 that we think the Commission should review, not only
8 to support, to meet the SRM for the new reactors, but
9 also the benefit of trying to improve the guidance for
10 our decision makers in reviewing issues that are very
11 difficult and complex for the current operating
12 reactors.

13 So, my next bullet is essentially, we have
14 a general structure, and one of the things, the
15 challenges that we have is to really try to define
16 clear entry conditions, when we can use it, when we
17 should not be using it if, for situations where we
18 know it's going to, you know, it's a better way than
19 spending a lot of time, spending, you know, nine
20 months to a year, you know, on a project to come up
21 with a better or more definitive number to reduce the
22 uncertainty and confidence.

23 So, where we are going is that, in
24 addition to the defining clear entry conditions, the
25 structure that we are, we are thinking of, the quality

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1 of structure is to follow the Reg Guide 1.174
2 structure.

3 That has been reviewed, vetted by the
4 ACRS, and the revision activities has, we have engaged
5 with the industry to make sure that, you know, there's
6 a good understanding on the major decision attributes
7 that needs to go into this qualitative structure.

8 And so, we are not stepping out on
9 developing something new where it's going to go
10 through a lot of challenging comments of how valid
11 that's going to be. So, we are taking existing
12 processes that we have in place.

13 Now, having said that, there's definitely,
14 in adopting that approach, that methodology, we need
15 to kind of help refine and make it clear, you know,
16 the questions that is in the decision attributes when
17 we ask the decision makers to kind of put it in a
18 context of a little bit more common sense. So, this
19 is something that we are working on.

20 So, in addition to the entry conditions,
21 we need to define, provide guidance to define and
22 assess the decision attributes, which, in the current
23 version, there is no detailed guidance.

24 So, how decision makers have lamented the
25 fact that sometimes we are not very sure, but we still

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1 out go out with the, with the best information that we
2 have with the decision that we make. So --

3 CHAIRMAN SKILLMAN: What is the status of
4 Appendix M right now?

5 MR. GIBBS: Do you want me to --

6 MR. WONG: Yes.

7 MR. GIBBS: -- speak to that?

8 MR. WONG: Go.

9 MR. GIBBS: Okay. So, we have been
10 working on this for a number of months, and we are
11 trying to reach an internal alignment about how to
12 carry forward this direction by the Commission to
13 produce this qualitative framework for both new
14 reactors and to provide clarity for the qualitative
15 framework for the existing fleet.

16 We believe Appendix M is a very viable
17 option, but we have to get that approved by the
18 Commission. This is a significant change to the
19 significance determination process.

20 And so, we don't want to, if you will,
21 pretend that the Appendix M and what we, what we plan
22 to do with this is the, is the, is the, is the right
23 option, because we need to propose to the Commission,
24 others as well.

25 And so, we've been working with our

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1 internal stakeholders. In fact, we just a meeting
2 last Friday with all of our division directors in the
3 regions, and we solicited to them to provide some
4 comments or ideas about other ways that we might be
5 able to do this.

6 The approach that See-Meng is, has shown
7 you is one of the options that we intend to propose to
8 the Commission.

9 We have, right now, a due date of June of
10 next year to produce a Commission paper with those
11 options.

12 We have a lot of work to do to develop
13 each of those options and provide, if you will, the
14 pros and cons, the merits of each. So, June of next
15 year is the Commission paper due date.

16 CHAIRMAN SKILLMAN: So, your Appendix M is
17 really your response to the Commission's comments and
18 the SECY 13-0137 regarding this development of a
19 structured assessment tool for qualitative assessment?

20 MR. GIBBS: It is. At this point, it's
21 the best we have, but we're reaching out to our
22 stakeholders to see if there might be other ways that
23 we might be able to accomplish the same thing.

24 CHAIRMAN SKILLMAN: But this is really
25 the, at this point in time, your Appendix, your

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1 emerging Appendix M is your response to the NRC's
2 guidance regarding SECY?

3 MR. GIBBS: Yes. It is.

4 CHAIRMAN SKILLMAN: Okay. Now, I
5 understand the level of detail and the guidance that
6 See-Meng is --

7 MR. GIBBS: Right.

8 CHAIRMAN SKILLMAN: -- communicating here.

9 MR. GIBBS: Okay. So --

10 MEMBER REMPE: So, out of curiosity, what
11 are the other stakeholders, internal stakeholders
12 proposing?

13 You said that there are other options.
14 Can you, I know it's preliminary, but give us an idea
15 of what --

16 MR. GIBBS: I'll give you an idea. What
17 if we wanted to have an integrated approach to
18 decision making for all inspection findings using
19 qualitative information? Not just relying on a point
20 estimate from a PRA.

21 That's just another idea. Another option
22 is, for these situations that are not necessarily
23 amenable to a probabilistic risk assessment.

24 Maybe we should define those as greater
25 than green and just go do an inspection to see what

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1 additional information we might need before we go
2 forward with a final decision.

3 I mean, we're really, right now, in the
4 creative mode of trying to understand what some of
5 those options might be.

6 MEMBER REMPE: And have, is your process
7 going to, after you finish looking at the internal
8 stakeholders, are you going to start socializing this
9 with the external stakeholders --

10 MR. GIBBS: Absolutely.

11 MEMBER REMPE: -- before you go to the --

12 MR. GIBBS: Because we want their ideas as
13 well.

14 MEMBER REMPE: Yes. Okay.

15 MR. GIBBS: Yes. That's a must.

16 MEMBER REMPE: Yes, I would think so.
17 Okay.

18 MR. GIBBS: Particularly for this, for
19 this exercise.

20 MEMBER BLEY: You generated a few
21 questions from me here. There is the existing
22 Appendix M, which you referred to here. Your last
23 comment stirred me. There are more than
24 point estimates from PRAs. If it's a decent PRA, you
25 get more than a point estimate. And thinking about

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1 the uncertainty you got there is useful.

2 This is a more general question. The
3 paper you're sending up in December clearly won't have
4 this new appendix to a chapter in the inspection
5 manual, but you'll hint at what's going to be in it, I
6 take it.

7 The other draft inspection manual changes,
8 are they going to be attached to this paper, or is
9 that just going to refer, is the paper essentially
10 going to look like the white paper we had for today?

11 MR. MERZKE: It's a plan. It is going to
12 be --

13 MEMBER BLEY: It's a plan, yes.

14 MR. MERZKE: -- a draft paper. But the
15 Commission didn't ask the staff to provide a paper on
16 the proposed changes to the baseline inspection
17 procedure.

18 We just added those to this particular
19 paper to give them an integrated look at, okay, we're
20 not, you know, proposing to do MSPI for AP1000.

21 This is what we plan to do in inspection
22 space, and then in SDP space. We just wanted to give
23 them an integrated look at the whole ROP for the new
24 reactor.

25 MEMBER BLEY: Okay. I don't want to

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1 divert us here, but somewhere at the end today, I want
2 to come back to MSPI and PIs and ask a question
3 because I've confused myself and I'm going to need a
4 little help.

5 (Laughter)

6 MR. MERZKE: Join the club.

7 CHAIRMAN SKILLMAN: Let's continue,
8 please.

9 MR. WONG: Okay. So, that's all I have
10 for these two appendixes, so --

11 CHAIRMAN SKILLMAN: Okay.

12 MR. WONG: -- I will turn it over to Matt
13 Leech who's a risk analyst in our Division of Risk
14 Assessment.

15 He's assigned the responsibility to work
16 on any revisions to Appendix G, which is the shutdown
17 SDP, and Appendix H, which is the containment
18 integrity SDP. These two SDPs has been sitting on our
19 books since, for a long time.

20 And so, as part of our continuing
21 improvement process, these two SDPs were identified as
22 areas for improvement.

23 So, and if I might mention, we do have a,
24 kind of a feedback process on our use that we rely on
25 to make improvements to SDP tools.

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1 We have an ROP feedback form that the
2 users, the risk analysts, the inspectors, when they
3 use it and they come across situations where they need
4 it, you know, additional guidance or clarifications.

5 And so, they send it to us and we use that
6 as a, kind of a foundation of how way we can improve
7 the tools that we have in place. So, Matt.

8 MR. LEECH: All right. So, as See-Meng
9 mentioned, my name's Matt Leech. The first procedure
10 I want to talk about for accommodating new reactors,
11 and specifically AP1000, is our Appendix G, which is
12 our shutdown procedure.

13 The general approach of the existing
14 Appendix G is going to still work for AP1000s, but the
15 way our current Appendix G works, it was designed
16 years ago before we had any SPAR models for shutdown.

17 And we still only have a few.

18 So, it's got an intermediate Phase 2
19 process, which is pre-solved of entries and tables
20 that we use if an operating reactor had a shutdown
21 event.

22 And we will not need to use that Phase 2
23 process because there actually is an AP1000 SPAR
24 model. I wanted to clarify that.

25 Idaho National Labs has developed an

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1 AP1000 SPAR model that's available for our use, and it
2 does have a shutdown event also that can be assessed.

3 Now, how good it is currently, I don't, or
4 how vetted the SPAR model is at this point, I'm not
5 sure. I know the Office of Research is going to
6 develop a more specific one with INL. This one is
7 just generic.

8 But the idea will be for Appendix G, that
9 for AP1000, if an event occurs, we can use the SPAR
10 model to assess the event. And we're going to do some
11 additional things as well.

12 Appendix G has some screening questions in
13 it that will be looked at and revised to see if
14 anything needs to change for the AP1000.

15 And we're going to, we're going to
16 highlight, in the basis technical document, IMC308,
17 Attachment 3, we're going to highlight some of the
18 differences and improvements that have been made for
19 shutdown in AP1000s. And that's the plan for Appendix
20 G.

21 CHAIRMAN SKILLMAN: Thank you.

22 MR. LEECH: All right.

23 CHAIRMAN SKILLMAN: Let's continue.

24 MR. LEECH: Okay. The next on is Appendix
25 H, which is containment-related issues. And once

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1 again, the general approach that we use for our
2 current Appendix H, we believe will work for AP1000.

3 We will have to modify and make some
4 changes here and there. Basically, there's a process
5 for screening events, and for containment in Appendix
6 H that will need to be revised to fold in the new
7 AP1000 for a Phase 1 and a Phase 2, which we actually
8 assess kind of an initial significance of the event
9 and highlight the differences that need to be spoken
10 about in an Appendix H basis document. But our basic
11 approach, with some modification and, will work.

12 CHAIRMAN SKILLMAN: You know, that kind of
13 sounds like a guy that opens a toolbox on a Saturday
14 afternoon and says, you know, I got this wrench. It's
15 not exactly the right one, but I can make it work.

16 (Laughter)

17 CHAIRMAN SKILLMAN: Well, and then half an
18 hour later, he's got a broken wheel stud and he says,
19 that was the wrong tool.

20 MR. LEECH: I, let me clarify. The reason
21 why it's, will be relatively easy to fold into
22 Appendix H is because even for containment-related
23 events, you start out with a SPAR model and you
24 assess, there's two types of findings.

25 There's a finding that affects core damage

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1 frequency, and there's a, there's a, there's events
2 that don't affect core damage frequency, but could
3 contribute to LERF, like a stuck open containment
4 isolation valve or something like that.

5 So, most of the events for Appendix H
6 start out where you need to assess what the core
7 damage frequency is, and that's where having a SPAR
8 model to work with already will make folding it into
9 Appendix H easy.

10 CHAIRMAN SKILLMAN: But isn't this what
11 John communicated earlier? You can have events where
12 CDF really isn't the driver. LERF is the true driver,
13 and that might involve RTNSS equipment.

14 MR. LEECH: Yes. Jeff's nodding.

15 MR. GIBBS: It's not, we don't see these
16 very often, but it is certainly possible.

17 MR. MITMAN: Yes. We, in fact, we had one
18 within the last year where, during shutdown, the
19 licensee couldn't close the equipment hatch, so,
20 during certain periods of the outage.

21 So, it had zero impact on core damage.
22 All right? But it has an impact on this with large
23 early release frequency.

24 So, Appendix H is currently set up to
25 divide the issue into two spaces. One where you have

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1 an impacted in, one where you have a performance
2 deficiency that impacts both the core damage frequency
3 and the LERF capability. And so, we assess that one
4 way. Okay?

5 And it also has a section that says, for
6 those issues that do not impact the core damage
7 frequency but do impact large early release frequency,
8 we go to this other approach.

9 So, we've bifurcated the methodology to
10 address the two approaches. Now, the thing that's
11 fundamentally, I shouldn't say fundamentally, the
12 thing that is potentially different with the AP1000,
13 with its lower core damage frequency, is even though
14 you have a finding that does not affect core damage,
15 the LERF, the LERF criteria is in order of magnitude
16 smaller, all right, so the threshold between green and
17 white for a LERF issue is 1 EMI 7.

18 So, you base that on a core damage
19 frequency, and then you look at how, what the impact
20 on the containment was. All right?

21 So, in the case we had earlier this year,
22 if the containment hatch can't be closed, then your
23 containment has failed.

24 It has failure probability of 1, and in
25 that case, the core damage frequency, or the LERF

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1 frequency is equal to the core damage frequency.

2 So, we have to, we have to consider the
3 case that the core damage frequency for the AP1000 is
4 different than the core damage frequency, say, for a
5 Westinghouse large dry containment.

6 And then, we have to look at those issues
7 on containment and how that factors in. Now, the
8 containment response is shutdown.

9 In an AP1000, I expect to be different
10 than the containment response for large, or for
11 containment issues at-power. You know, you can be
12 relying upon different systems to do that.

13 So, we've got to take a look at that and
14 think about how those things are impacted. But the
15 general approach of dividing performance deficiencies
16 into two categories, one, that affect both core damage
17 and LERF, will be assessed, and then another portion
18 of the procedure that addresses those issues that'll
19 get containment.

20 MEMBER RAY: This is Harold Ray. Let me
21 just say, this containment isn't just a containment.
22 It's also the ultimate heat sync heat exchanger, and I
23 think that repeats comments that have been made
24 earlier in this meeting.

25 So, when you say that containment,

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1 existing procedures and protocol for containments are
2 applicable here, just keep in mind that this isn't
3 just a containment. It's also a heat exchanger.

4 MR. LEECH: Yes.

5 CHAIRMAN SKILLMAN: Thank you, Harold

6 MR. LEECH: I understand that.

7 CHAIRMAN SKILLMAN: Thank you.

8 MEMBER RAY: It's what Dick was saying
9 earlier, basically.

10 CHAIRMAN SKILLMAN: Yes. Thank you.
11 Let's proceed, please.

12 MR. GIBBS: So, just to, just to be clear,
13 we have work to do. When I, when we say the
14 procedures are going to be modified, we're not exactly
15 sure how they're going to be modified.

16 But what we're saying is that we have a
17 framework to work within, as Jeff just pointed out,
18 acknowledging that, indeed, we're going to have to
19 make some changes.

20 We're not exactly sure what those changes
21 are. But we believe the framework itself is solid for
22 us to continue within that framework. Meaning, no new
23 SDPs are going to be required, we don't believe.
24 Okay.

25 So, the path forward, final slide for the

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1 SDP portion is, of course, we're going to have to
2 reach some internal alignment on these proposed
3 changes. And I presume you're aware of the
4 SRM/COMSECY-16-0022.

5 There's direction from the Commission
6 where changes, for example, to the significance
7 determination process, are going to require Commission
8 approval.

9 We believe, most assuredly, that what we
10 do to address the qualitative structure for new
11 reactors, and what we do to provide clarity for the
12 current operating fleet will require Commission
13 approval.

14 I don't know about the others, but I
15 suspect that the other changes that we're proposing
16 may not require approval, but certainly would require
17 some type of Commission notification, and that would
18 be consistent with that particular SRM-16-0022.

19 And the, particularly, you know, the value
20 in communicating with, working with our external
21 stakeholders and conducting these public meetings and
22 tabletop exercises, by the way, that's required by
23 our, by our program, remainder of Chapter 0609 is very
24 clear about that, particularly when you're making
25 substantive changes that you do some benchmarking,

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1 that you do case studies, and of course you do some
2 type of tabletop exercise to see if what you want to
3 do seems to, seems to work and make sense.

4 And then, right now, the schedule is that
5 this work will be done by December of next year. We
6 have a lot of work to do.

7 We'll see, we'll see where that goes with
8 respect to the schedule, you know, based on what's
9 happening with the construction of the, of the new
10 plants.

11 And I'll just leave it at that and turn it
12 over to Dan, in case you have any final questions
13 about the SDP program itself.

14 MR. MERZKE: I see none.

15 CHAIRMAN SKILLMAN: Please proceed.

16 MR. MERZKE: Okay.

17 CHAIRMAN SKILLMAN: Thank you.

18 MR. MERZKE: I'm just going to roll up,
19 I'm sorry. I'm just going to roll up the summary,
20 basically, of what you've already heard here.

21 So, I'll kind of just go through these
22 slides relatively quickly. Staff inclusions, we're
23 going to maintain.

24 We've just seen risk thresholds consistent
25 with Commission guidance preserving the existing ROP

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1 structure as is, and we are proposing no changes to
2 the assessment program, as currently specified in
3 9005.

4 Under the performance indicators, many of
5 the PIs are based on regulations and standards that
6 also apply to the new reactor designs.

7 Twelve of the 17 current PIs remain valid
8 for the AP1000. The five PIs that comprise the MSPI
9 indicators would not be valid.

10 The staff has identified no new PIs that
11 would be effective in monitoring performance to the
12 AP1000 at this time.

13 And maintaining existing PI thresholds
14 pending staff evaluation after some operating
15 experience is gained.

16 So, we'll, I mean, it's part of our
17 regular ROP self-assessment process. We'll always
18 come back on an annual basis and review the
19 performance indicator program.

20 Are the PIs appropriate? Are they giving
21 us, are they measuring what we want as a measure? Is
22 there, is there another new PI that might be possible?

23 I mean, these are all questions we ask annually, on
24 an annual basis. So --

25 CHAIRMAN SKILLMAN: And let me ask you

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1 this. Have you heard anything today that would cause
2 you to rethink your second bullet there regarding new
3 PIs or regarding those MSPI indicators?

4 MR. MERZKE: I heard you say that there's
5 no way why we couldn't make valid MSPI indicators out
6 of the RTNSS systems.

7 We'll go back and take a look, I know the
8 white paper specified that failure of the RTNSS
9 systems would never cross a threshold.

10 I guess we could take another look at the
11 thresholds. I need to look at that evaluation. I was
12 not around, or I wasn't part of the development of
13 that paper.

14 But it's certainly worth taking another
15 look at to make sure that, you know, we have our, we
16 have a good technical basis for deciding not to have
17 an MSPI.

18 CHAIRMAN SKILLMAN: Well, that was one
19 comment. It had to do with the RTNSS system. The
20 other had to do with considering whether or not there
21 needed to be recognition that the physical phenomenon
22 for the passive plants is just as important as the
23 SSCs are for the active plants.

24 MR. MERZKE: I did hear that, sir. And
25 I'm, we'll have to take another look at that and

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1 evaluate it under a PI program to see if there's
2 something that we could use to develop that might
3 measure that performance.

4 CHAIRMAN SKILLMAN: I mean, like Harold
5 just said, for the AP1000, the containment is the heat
6 exchanger.

7 MR. MERZKE: The heat exchanger. Right.

8 CHAIRMAN SKILLMAN: And so, the fouling on
9 the heat exchanger surface is important.

10 MR. MERZKE: That is, I agree.

11 CHAIRMAN SKILLMAN: And so, when you say,
12 it really screens out, I've got to think of my life
13 back in Region 1.

14 Not many things screened out. We were in
15 trouble all the time. So, I'm thinking it's the same
16 kind of a deal. And so --

17 MR. MERZKE: My initial --

18 CHAIRMAN SKILLMAN: -- I'm sorry, but --

19 MR. MERZKE: My initial impression is that
20 would be captured more under inspection space than PI
21 space.

22 CHAIRMAN SKILLMAN: And concur with you,
23 and Harold's right. That's in surveillance. But
24 somehow, this program is intended to flag a departure
25 from fully satisfactory to threshold deficient.

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1 And if I have a fire in containment and I
2 fowled my containment surface, I believe I've got a
3 threshold deficiency.

4 And I believe that requires some
5 attention. Maybe even scrubbing down the inside of
6 the building. And --

7 MR. MERZKE: I think you make a valid
8 argument. I don't disagree.

9 CHAIRMAN SKILLMAN: Thank you. Let's
10 proceed. Thanks.

11 MR. MERZKE: All right, sir. Thank you.
12 For the inspection program, the staff concluded that
13 there are very few changes needed to the inspection
14 requirements.

15 There will be additional guidance added,
16 as necessary. We'll be adjusting sample sizes to
17 specify, including, at a minimum, risk important and
18 RTNSS systems.

19 That doesn't mean that there's, we do say
20 that there's no new inspection required, but that
21 doesn't mean that we're not going to update the
22 guidance to ensure that we focus our appropriate
23 attention on those systems that are important to
24 safety, even if they are not safety-related.

25 Under MSPI, the IPs, as written, are

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1 sufficient to assess licensee performance and
2 mitigating cornerstone without MSPI.

3 Again, the guidance will specify the
4 appropriate inspection samples to cover those passive
5 safety systems, where applicable.

6 And you just heard from the significance
7 determination process, the existing SDP program is
8 robust and inclusive, and no new SDPs will be
9 developed.

10 And we will be making modifications to the
11 SDPs for at-power shutdown, containment, and use of
12 qualitative criteria.

13 And those will all be, hopefully, worked
14 off by the end of next year, but we also recognize
15 that we've got some time because the schedule for
16 completion for the Vogtle plants are sometime out yet.

17 So, we're going keep a push on the
18 schedule, and it's better to get done sooner rather
19 than later.

20 So, finally, our staff recommendation is
21 for the Commission to approve the staff's plans to
22 modify the ROP for new reactors, as described in that
23 white paper in front of you.

24 We will be seeking additional Commission
25 approval for specifics, to specific changes to the

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1 SDPs, specifically for the Appendix M.

2 And if any of the other ROP changes that
3 we're, we identify as part of this process, meet the
4 criteria of significant changes as specified in the
5 SRM, the COMSECY-16-0022, then we will seek Commission
6 approval for those issues too.

7 Our next steps are to finalize the
8 Commission paper based on your comments and
9 stakeholder feedback, and the paper's due to the
10 Commission by the end of this year. And that
11 concludes our formal presentation.

12 MEMBER STETKAR: I know Dennis had a
13 question --

14 MR. MERZKE: Right.

15 MEMBER STETKAR: -- on indicators.

16 MEMBER BLEY: Actually Daniel kind of
17 covered mine, so I don't need to ask.

18 MEMBER STETKAR: You're not confused
19 anymore?

20 MEMBER BLEY: I think --

21 (Simultaneous speaking)

22 MEMBER STETKAR: I'll talk to you after
23 the meeting.

24 (Laughter)

25 MEMBER STETKAR: I'll have pencil and

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1 paper ready. What I wanted to ask is, and I wanted to
2 wait until the end to not confuse things.

3 The whole discussion that we've had today
4 and the discussions in this white paper and the
5 proceeding, the NEI white papers, and the staff's
6 white paper on MSPI, have all focused on that bugaboo
7 of AP1000 because, well, it's the only thing that we
8 have to hang our hat on and, by God, you know, we're
9 going to build four or maybe two or maybe one of them,
10 or maybe none of them.

11 NuScale seems to be raising its ugly head
12 as something that might actually be built somewhere,
13 sometime, by somebody.

14 Have you thought at all about that design?
15 Because we actually know something about that design,
16 at least technical information about it.

17 MEMBER POWERS: About this week's version.

18 MEMBER STETKAR: That's true. But I mean,
19 you know, we know it doesn't look --

20 MEMBER POWERS: Well --

21 MEMBER STETKAR: -- like a cardboard box.

22 That's what I'm trying to get at. We kind of, sort
23 of, they're going to change fundamental elements of
24 the way that machine is supposed to work, at least in
25 terms of safety functions and heat removal functions

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1 and things like that.

2 Have you thought at all about that in the
3 context of this, to see if any additional, or tweaks
4 are needed?

5 MALE: I'll be honest --

6 MEMBER STETKAR: And I, and I, and I'm not
7 advocating thinking about the other 47 or whatever,
8 you know, bizarre designs that have been formulated
9 out there, or necessarily gas reactors.

10 MR. AYEGBUSI: So, I've been part of this
11 working group for a couple of years now on ROP for new
12 reactors. And so, specifically, the Commission has us
13 working on ROP for new reactors, right?

14 MEMBER STETKAR: Right.

15 MR. AYEGBUSI: SMRs don't fall into that.
16 They fall under advanced reactors, right? So, all
17 the work we've done with this working group has been,
18 has been focused on things like ABWR, ESBWR, AP1000-
19 type plants.

20 MR. MERZKE: So, the short answer is no,
21 we've not really assessed SMRs under --

22 MR. AYEGBUSI: Because --

23 MR. MERZKE: -- advised in the ROP.

24 MEMBER STETKAR: Thanks. You've helped me
25 because I've never drawn the distinction between a new

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1 reactor and a not new reactor because it's an advanced
2 reactor.

3 MR. MERZKE: I think we kind of touched on
4 this earlier though that, given the processes that we
5 use to make these recommendations for the AP1000, they
6 can easily translate to any of the other reactor
7 designs. And I would say, I don't see why we couldn't
8 use the same procedures for the SMRs. And --

9 MEMBER STETKAR: That's what I was hoping
10 you would say, but --

11 MR. MERZKE: And it would be, maybe, a two
12 to three year overall process to lock down a good ROP
13 process for the SMRs. But again, we'd probably end up
14 going to the Commission with those recommendations.

15 MEMBER STETKAR: All right. Thanks.

16 CHAIRMAN SKILLMAN: Okay. Chris and Dan
17 and the entire staff, thank you very much for a very
18 informative, very fruitful afternoon. This has been
19 an excellent set of presentations, and I want to thank
20 you very much.

21 MR. MERZKE: Thank you, appreciate it.
22 And we do appreciate the questions and the scenarios
23 you threw out.

24 Now, I'll be honest, some of those things
25 you threw out, I wasn't thinking about, but you know,

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1 maybe there are people smarter than me because I just
2 got thrown into this new reactor thing a few months,
3 so I'm still learning. But --

4 CHAIRMAN SKILLMAN: Thank you.

5 MR. MERZKE: -- good insights, and I
6 appreciate it. Thank you.

7 CHAIRMAN SKILLMAN: Let me ask my
8 colleagues, if any has a comment, Dr. Rempe, would you
9 please lead?

10 MEMBER REMPE: Oh, sure. I also
11 appreciated the presentation, and I found it very
12 informative, and I don't have any additional comments.

13 MEMBER KIRCHNER: Thank you for the
14 presentation. Just the, one thing I was thinking,
15 looking ahead to new reactors, you know, you had a
16 chart early in your presentation about the
17 cornerstones, and obviously one of them is barriers,
18 although we spent more time on mitigating systems.

19 Without getting into any one design,
20 characteristic of most of the proposed designs for new
21 reactors or advanced reactors, something would
22 eliminate some of the traditional defense and death
23 barriers that we have with the existing fleet.

24 Most would take advantage of either
25 inherent feedback affects or other passive design

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1 considerations for ultimate heat rejection, et cetera,
2 reactivity control, and so on. These are, by and
3 large, not, well, passive. So, stationary systems.

4 And it just seems to me that the, although
5 reportedly, they have a lower risk that remains to be
6 determined, but it would seem to me, just in general,
7 that the inspection, especially inspection, maybe
8 it's, it begins with Appendix B in the actual design
9 and construction, but it continues into operational
10 space, becomes more critical, and yet, perhaps more
11 difficult.

12 And some of the systems will have what I
13 would describe as, if they fail, they're not going to
14 fail gracefully. That they will have cliff phenomena.

15 And that becomes a little more difficult in
16 inspection space.

17 You know, you, and I hesitate, and I will
18 not use an actual example, but everything will go
19 along okay, but then all of a sudden, you might see
20 something like increased coolant activity or
21 something.

22 And then you're quickly beyond, you know,
23 where you wanted to be, so to speak. So, I see that
24 as a challenge to you in trying to come up with a
25 generic approach, looking down the road to new

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1 reactors that are not OWR derivative. And thank you.

2 CHAIRMAN SKILLMAN: Thank you, Walt.
3 John?

4 MEMBER STETKAR: Yes, thanks. Again, I
5 really appreciate the discussion. I, and despite my
6 comments on indices and whether they ought to have
7 indices.

8 I don't advocate calculating seven
9 significant figure numbers according to some algebra,
10 just for the sake of doing that.

11 I can see where reason changes to the
12 inspection program can accomplish the same goals, and
13 maybe even more efficiently.

14 And with that, I'm really looking forward
15 to seeing the changes that you're going to be making
16 to the inspection manual so that we have some
17 confidence that, if there is value added today by the
18 MSPI, that we can retain that value through the
19 enhanced, whatever you want to call it, enhanced
20 inspection program. So, thanks a lot.

21 CHAIRMAN SKILLMAN: Thank you, John. Dr.
22 Bley.

23 MEMBER BLEY: It's been an interesting
24 day. Although I said I'm not still confused, I've --

25 (Laughter)

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1 MEMBER BLEY: -- going to try to put all
2 this together and try to get, is a bit difficult. I
3 kind of get why you can't get an index over different
4 kinds of things that go together for which you have
5 some qualitative, some quantitative.

6 Other, I need to study this stuff a bit
7 more. I'm thinking about, we're writing a letter next
8 month, right?

9 CHAIRMAN SKILLMAN: No.

10 MEMBER BLEY: No? Oh, I thought you had a
11 letter coming up on this.

12 CHAIRMAN SKILLMAN: No, this is a plain
13 information briefing.

14 MEMBER BLEY: Just information briefing.

15 CHAIRMAN SKILLMAN: Yes, sir. Yes, sir.

16 MEMBER BLEY: So, we'll, will we have
17 another meeting on your submittal to the Commission,
18 either before or after you send it out? No?

19 MR. MERZKE: This is, this paper's going
20 up in December, so it was decided there was no reason
21 to have a formal meeting.

22 MEMBER STETKAR: The white, the white
23 paper will have a SECY --

24 MR. MERZKE: That is correct.

25 MEMBER STETKAR: -- number attached to,

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1 right?

2 MR. MERZKE: That is correct.

3 (Laughter)

4 MR. MERZKE: That is correct.

5 MEMBER BLEY: Well, we'll surely want to
6 see that white paper when it goes up, and I'm sorry.

7 MEMBER STETKAR: The white paper that we
8 saw for this subcommittee meeting --

9 MR. MERZKE: That is the draft SECY paper
10 that's going to the Commission.

11 MEMBER BLEY: I understand that.

12 MR. MERZKE: Okay. All right.

13 MEMBER BLEY: It's not a SECY paper today.
14 It will be a SECY paper when it goes up in December.
15 Oh, okay.

16 MR. MILLER: There will be some more work
17 on it, but it has the essential elements --

18 MEMBER BLEY: Yes. I understand that.

19 MR. MILLER: -- that you see in the white
20 paper. Yes.

21 MEMBER BLEY: Mr. Stetkar's frowning at me
22 and raising his eyebrows, and I'm not sure if he wants
23 to talk about that. I look forward to seeing its
24 final form and digging back through some of the basis.

25 You know, John asked a lot of questions

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1 and I started looking around, trying to track down
2 where the thresholds come from, and I guess, going
3 through the, some of the inspection procedures, and
4 you track it back, it seems to go back to SECY-99007.

5 And --

6 MR. MERZKE: 99007 was the original basis
7 document for the --

8 (Simultaneous speaking)

9 MEMBER BLEY: Yes. And some of the
10 language has changed, but the basic ideas --

11 MR. MERZKE: That is correct.

12 MEMBER BLEY: -- are still all there. But
13 when you look in the inspection procedures and see,
14 here's a threshold, it says, go back and see that SECY
15 to figure out how we came up with this, and I don't
16 quite have all of that, so I want to go look at that.

17 Eventually, this will come back to us in
18 some form or another at some point in time, and I hope
19 to be better informed when you come back.

20 MR. MERZKE: That SECY's about 400 pages
21 long.

22 MEMBER BLEY: Yes, I got it.

23 (Laughter)

24 MEMBER BLEY: It's got a lot of
25 attachments.

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1 MEMBER STETKAR: There's a couple of big
2 new regs that get referred to that --

3 CHAIRMAN SKILLMAN: Thank you, Dennis.
4 Dr. Powers.

5 MEMBER POWERS: Well, I'm certainly glad
6 we had this information briefing. I found it very
7 useful.

8 I am especially excited about what's going
9 on, and with Mr. Gibbs and Mr. Wong in their shop.
10 And my personal belief that we have not optimized our
11 SPAR modeling, PRA modeling to suit the needs of the
12 inspection and enforcement parts of the NRC. And I
13 think we can. And I think they've hit upon a
14 mechanism to drive that if they'll take advantage of
15 it.

16 So, I'm very hopeful we can have another
17 information briefing once you've gone through your
18 trials and experiments, because I think that's a
19 mechanism that will allow us to start pressing the
20 model developers to get one, get models that are less
21 focused on CDF, and more focused on what it is that
22 the inspection people need to focus their activities
23 in the most productive area.

24 CHAIRMAN SKILLMAN: Thank you. Dr.
25 Ballinger.

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1 MEMBER BALLINGER: Well, I found this
2 extremely informative. Of the Members sitting around
3 the table today, I'm the least, I have the least
4 knowledge. I'm hopeful that by the time I exit the
5 carbon cycle, I'll know enough to be able to make --

6 (Laughter)

7 MEMBER BALLINGER: -- a SECY-an comment on
8 this. But I found it really very interesting. Thank
9 you very much.

10 CHAIRMAN SKILLMAN: Okay, thank you.
11 Harold, are you still with us?

12 MEMBER RAY: I am, and I guess I won't add
13 anything that I've said already other than to say I
14 think we should all think about, how do we engage with
15 the, given the comments that have been made, the
16 determination of what surveillance programs are
17 required for licensees of new plants.

18 I don't think we get into that in the
19 certification process or any other time that I'm
20 familiar with.

21 So, even though I don't think it's,
22 belongs in the oversight, I think it is an important
23 matter to consider at some point. And with that, I'll
24 end.

25 CHAIRMAN SKILLMAN: Harold, thank you for

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1 sticking with us. Thank you very much. With that, I
2 would like to invite any member of the public in the
3 audience to come to the microphone and make any
4 comment, please.

5 Seeing none, we're going to make sure the
6 microphone is opened. On the, on the call-in line, is
7 there anybody there? If so, would you just simply say
8 hello?

9 Hearing none, we can close the line. With
10 that, everybody, thank you for an excellent meeting,
11 and we are adjourned.

12 (Whereupon, the above-entitled matter went
13 off the record at 5:37 p.m.)
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UNITED STATES NUCLEAR REGULATORY COMMISSION

Protecting People and the Environment

REACTOR OVERSIGHT PROCESS FOR NEW REACTORS

**Advisory Committee on Reactor Safeguards
Subcommittee on Plant Operations**

Contact: Dan Merzke, NRR/DIRS

September 20, 2017

Meeting Purpose

Discuss staff's evaluations, conclusions and recommendations as noted in white paper to modify the Reactor Oversight Process (ROP) for new reactors in response to the SRM on SECY-13-0137

Agenda

- Background and overview of the ROP for new reactors
- Discussion of appropriateness of existing Performance Indicators and thresholds
- Baseline Inspection program changes
- Significance Determination Process (SDP)
- Conclusions and recommendations in white paper
- Next steps

Background

- Baseline risk estimates for most new reactor designs are lower than those for a design similar to that of the current fleet
- Lower risk values raised questions about how to apply acceptance guidelines for changes to licensing basis and regulatory response in ROP
- Over past several years, staff has corresponded with Commission and ACRS to address staff's recommendations related to risk-informed guidance for new light-water reactor applications

Background (cont.)

- SECY-10-0121, “Modifying the Risk-Informed Regulatory Guidance for New Reactors,” issued September 2010 to provide options to modify risk-informed regulatory guidance for new reactors.
- Staff recommended working with stakeholders to identify and implement appropriate changes to the existing risk-informed guidance based on lower baseline risk of new reactors.
- In its SRM, the Commission disapproved the staff’s recommendation, and reaffirmed that the existing safety goals, safety performance expectations, subsidiary risk goals and associated risk guidance, key principles and quantitative metrics for implementing risk-informed decision making, are sufficient for new plants.

Background (cont.)

- SECY-12-0081, “Risk-Informed Regulatory Framework for New Reactors,” issued June 2012 to provide staff recommendations on both licensing and oversight processes
- Staff recommended development of qualitative risk insights (deterministic backstops) to supplement probabilistic risk assessment (PRA) information to determine significance of inspection findings.
- In its SRM, the Commission disapproved the staff’s recommendation, and directed the staff to consider using relative risk metrics, or to provide a technical basis for why this option was not viable.

Background (cont.)

- In SECY-13-0137, “Recommendations for Risk-informing the Reactor Oversight Process for New Reactors,” issued December 2013, the staff:
 - Developed a technical basis for its proposal to use qualitative considerations for characterizing the significance of inspection findings.
 - Performed a technical evaluation of the use of relative risk measures for characterizing the significance of inspection findings. Recommended against using relative risk metrics.
 - Evaluated the appropriateness of the existing performance indicators (PIs) and the related thresholds for new reactors.

Background (cont.)

- In its SRM to SECY-13-0137, the Commission:
 - Disapproved the staff's recommendation to use qualitative measures to supplement quantitative risk evaluations, and directed the staff to enhance the existing SDP for conditions not currently modeled.
 - Noted that the overall structure of the existing ROP should be preserved.
 - Directed the staff to develop appropriate Performance Indicators (PIs) and thresholds for new reactors, specifically in Initiating Events and Mitigating Systems cornerstones, or develop additional inspection guidance to address shortfalls to ensure all cornerstone objectives are adequately met.
 - Directed the staff to explore how the current Safety System Functional Failure PI would be applied to the passive safety-related components in Generation III+ reactors.

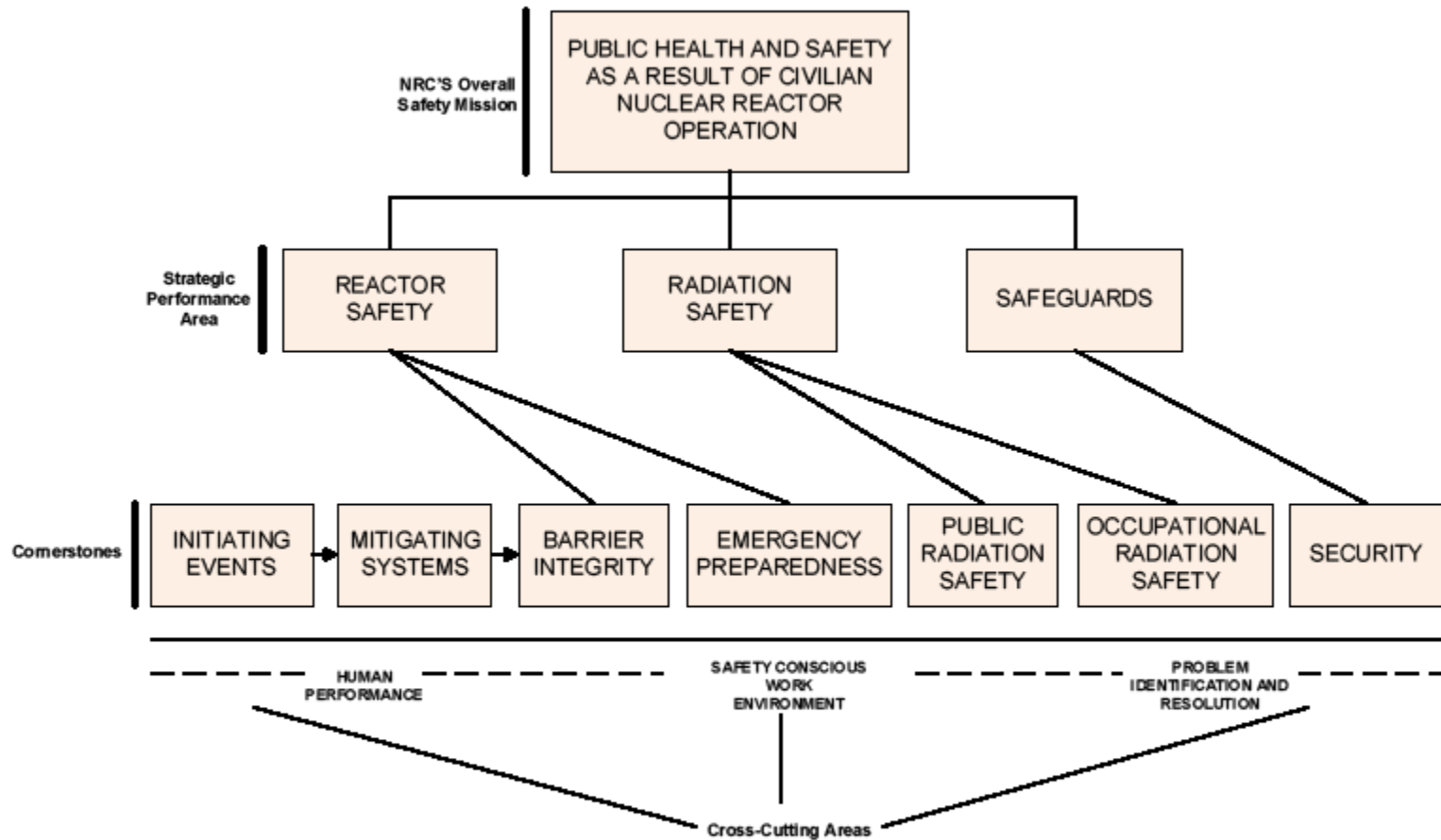
Staff Approach

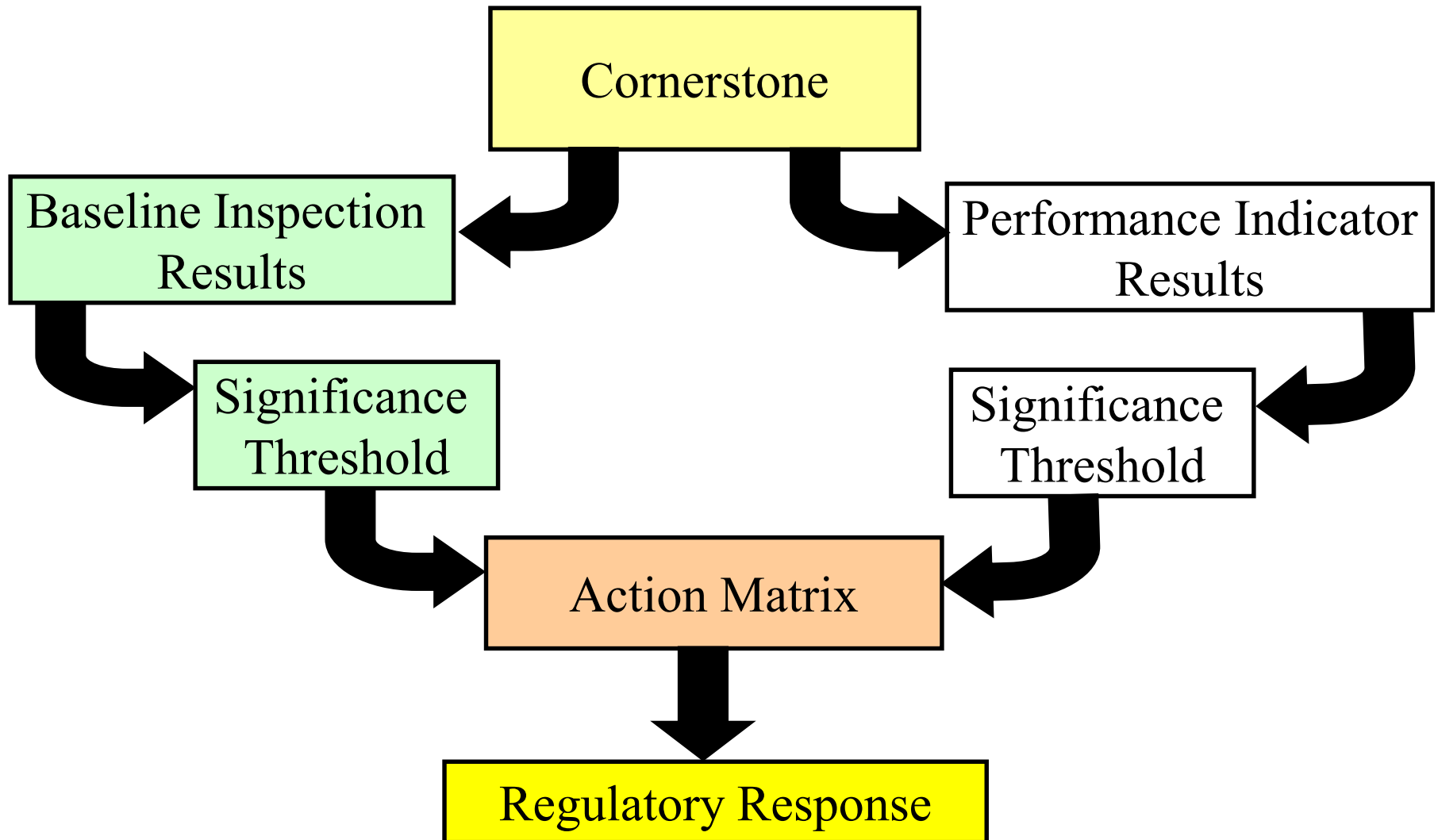
- Deliverable is a Notation Vote SECY for EDO signature in December 2017.
- Involve internal and external stakeholders, including NRR, NRO, Regions, Industry, ACRS, and public
- Maintain existing risk thresholds consistent with Commission guidance in SRM-SECY-10-0121.
- Preserve existing ROP structure.
- Provide to the Commission an integrated description of the ROP for new reactors (i.e., AP1000)

Reactor Oversight Process

- Reactor Oversight Process (ROP)
The NRC's program to inspect, measure, and assess the safety and security performance of commercial nuclear power plants and to respond to events and any decline in performance
- ROP Objectives
 - Risk-informed
 - Objective
 - Predictable
 - Understandable
 - Open & transparent

REGULATORY FRAMEWORK

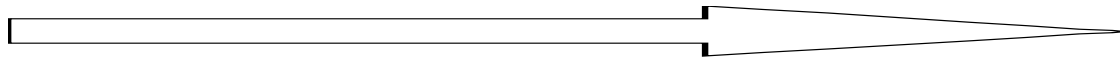




Action Matrix Concept

Licensee Response	Regulatory Response	Degraded Performance	Multiple/Repetitive Degraded Cornerstone	Unacceptable Performance
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Column 1 Column 2 Column 3 Column 4 Column 5



- Increasing safety significance
- Increasing NRC inspection efforts
- Increasing NRC/licensee management involvement
- Increasing regulatory actions

ROP Program Areas

- Assessment
- Performance Indicators
- Baseline Inspection
- Significance Determination Process

Assessment

- The staff is recommending no changes to the assessment program for assessing licensee performance for new reactor designs.

Appropriateness of Existing Performance Indicators and Thresholds

Ayo Ayegbusi, NRO/DSRA

Background

- Mitigating Systems Performance Index (MSPI) evaluated in SECY-12-0081, “Risk-Informed Regulatory Framework for New Reactors”
 - MSPI indicators are risk-informed
 - Determined to be ineffective in determining an appropriate regulatory response for active new reactor designs
- Remaining PIs not evaluated in SECY-12-0081
- SRM-SECY-12-0081 directed the staff to provide discussion of the appropriateness of existing performance indicators (PIs) and related thresholds for new reactors

Background

- Appropriateness of Existing PIs and thresholds evaluated in SECY-13-0137, “Recommendations for Risk-Informing the Reactor Oversight Process for New Reactors”
 - The staff reviewed the basis and related thresholds for the remaining PIs to determine appropriateness for new reactor designs
 - Staff concluded that the PIs remain applicable to new reactors with minor guidance adjustments
 - Unplanned Scrams with Complications indicator would need to be supplemented with additional guidance for new reactor designs to account for passive systems
- SRM-SECY-13-0137 directed the staff to develop appropriate Performance Indicators (PIs) and thresholds for new reactors or develop additional inspection guidance to address identified shortfalls

Performance Indicator Program

- Provides a broad sample of objective data to assess reactor facilities performance in each cornerstone area
- Along with inspection findings, serve as inputs to ROP assessment process and additional inspection efforts
- Performance indicator data voluntarily collected by reactor facility, reported to NRC on a quarterly basis
- Objective thresholds establish the level of regulatory engagement appropriate to reactor facility performance in each cornerstone area
- Inspection to verify performance indicator data

PI Performance Bands

Green: performance within an expected performance level where the associated cornerstone objectives are met

White: performance outside an expected range of nominal utility performance but related cornerstone objectives are still being met

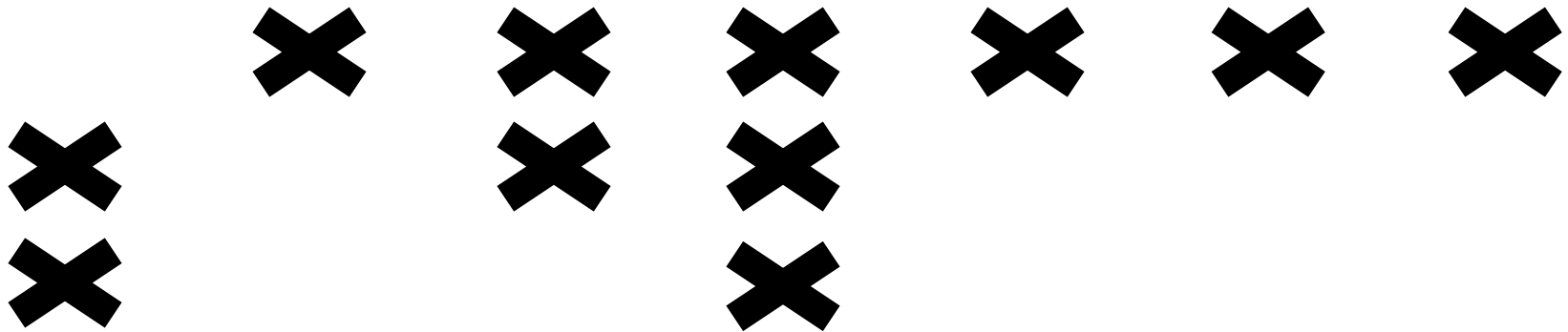
Yellow: related cornerstone objectives are being met, but with a minimal reduction in the safety margin

Red: significant reduction in safety margin in the area measured by the performance indicator

Risk-Informed PIs vs. Deterministic PIs

- Many of PIs are not directly risk-informed, but based on regulations and standards that would also apply to new reactor designs
- PIs directly related to risk or risk-informed
 - Mitigating Systems Performance Index (5)
 - Unplanned Scrams per 7,000 Critical Hours
- Remaining PIs and thresholds are more deterministic
 - Thresholds based on industry performance and agreed upon by experts (industry and NRC)

Performance Indicators



Risk-Informed PIs

- **Mitigating Systems Performance Index**
 - Measures readiness of systems to perform their safety function (availability and reliability)
 - High Pressure Injection
 - Heat Removal
 - Residual Heat Removal
 - Emergency AC Power
 - Support Cooling Water
- **Unplanned Scrams per 7,000 Critical Hours**
 - Measures the rate of scrams/year and provides an indication of initiating event frequency
 - Normalized to 7,000 critical hours (80% capacity factor)
 - Impact of plant trips on industry wide plant risk was used to inform the PI thresholds

White Papers

- Industry White Papers
 - Evaluated all Performance Indicators for applicability to AP1000
 - Determined all PIs except MSPI are applicable with limited changes to the PI program
 - Determined MSPI was inadequate
- NRC White Paper
 - Arrived at similar conclusion with Industry white paper
 - Further evaluated potential to replace MSPI with Safety Valve Unreliability Index
 - This proved to be impracticable due to limited testing and operation of the valves.

Evaluation of Pls

- Mitigating Systems Performance Index
 - Application evaluated in SECY-12-0081, “Risk-Informed Regulatory Framework for New Reactors”
 - Ineffective in determining an appropriate regulatory response for active new reactor designs
 - Meaningful MSPI may not even be possible for passive systems using the current formulation of the indicator
- Unplanned Scrams per 7,000 Critical Hours
 - CDF sensitivity studies conducted to inform initial threshold setting
 - Conservative thresholds set for existing fleet
 - Existing thresholds of performance bound lower risk of new reactors
- Unplanned Scrams with Complications
 - Potential adjustments to the guidance (NEI 99-002) for new reactors

Conclusions

- Overall, relatively modest adjustments to the program areas of performance indicators (PIs)
- Unplanned Scrams per 7,000 Critical Hours
 - Can be applied to new reactor designs
 - Threshold values are set conservatively and will account for lower risk of new reactors
- Unplanned Scrams with Complications
 - Propose developing new reactor specific guidance in NEI 99-002 for PI reporting guidance
- Mitigating Systems Performance Index
 - Not applicable for AP1000 design
- Remaining PIs can be applied to new reactor designs to determine an appropriate regulatory response

Baseline Inspection Program Changes

Steve Campbell, NRR/DIRS

Background

- SECY-13-0137, “Recommendations for Risk-Informing the Reactor Oversight Process For New Reactors”, staff recommended developing additional inspection guidance to address identified PI shortfalls to ensure that all cornerstone objectives are adequately met.
 - Commission approved this recommendation (Recommendation 2).

Background

- Mitigating Systems Performance Indicator (MSPI) monitors availability and reliability of safety systems necessary to mitigate accidents.
- Regulatory Treatment of non-Safety System (RTNSS) are non-safety-related Structures, Systems, and Components that perform risk-significant functions and, therefore, are candidates for regulatory oversight.
- Industry White Paper provided aspects of the ROP for the AP1000 Reactor Design.

Evaluation

- Gap analysis conducted on 20 Baseline IPs for changes to accommodate inspecting AP1000 design:
 - Few changes are required.
 - Possible adjustments to sample sizes and resource estimates.
 - Possible reference to inspecting RTNSS.
 - Sample range:
 - Adjust sample ranges based on fewer components and lower baseline risk.
 - Based on the risk importance (high (Δ CDF greater than $1E-4$) and intermediate (Δ CDF less than $1E-4$ but greater than $1E-5$)).
 - Based on system classified as RTNSS.
 - Accessibility of component (inside or outside containment).

Evaluation

- MSPI:
 - Breadth of baseline inspections assess the availability, reliability, and capability of mitigating systems and meets MSPI purpose.
 - Passive systems are expected to be reliable and the existing baseline minimums paired with the lower AP1000 baseline risk is more than adequate to compensate for the MSPI's omission.
 - The staff has determined that additional inspections are not needed to compensate for not using the MSPI indicators for the AP1000 design.

Evaluation

- Inspection staffing during outages:
 - Safety-related systems, high and intermediate risk important systems, and systems identified as RTNSS become accessible for inspection.
 - An outage inspection team will be formed to support the inspections of those systems.
 - Team augmented with an additional inspector to assist with conducting as-left equipment walkdowns, surveillance testing, post-maintenance testing, and containment closeout.
 - Other team members would conduct outage-related engineering and radiation protection inspections.

Conclusions

- Gap Analysis completed
 - Few changes to inspection requirements, add guidance as necessary.
 - Anticipate adjustments to sample sizes (risk importance and RTNSS).
- MSPI
 - Not applicable to AP1000 design
 - AP1000 has lower baseline risk.
 - IPs as written are sufficient to assess licensee performance in MS cornerstone without MSPI.
- Inspection Resources
 - Outage team dispatched from Region to cover outage-related operational and program inspections.

Significance Determination Process (SDP) Changes

Russell Gibbs, NRR/DIRS
See-Meng Wong, NRR/DRA
Matt Leech, NRR/DRA

Purpose

- Discuss the plans and basis for the development of SDP tools for new reactors (i.e., AP 1000 plants)
- Provide an overview of revisions to IMC 0609 Appendices A, G, H, and M used for operating reactors that can be adapted to reflect the unique design and operational practices of advanced reactor plants

Background

- Commission Staff Requirements Memorandum (SRM) on SECY 13-0137, dated June 30, 2014
 - Develop guidance to address circumstances that are unique to new reactors, e.g., uncertainty of reliability of passive SSCs or other SSCs with limited operational experience.
 - Enhance the SDP by developing a structured qualitative assessment for events or conditions that are not evaluated in the supporting plant risk models, e.g., performance deficiencies associated with passive safety systems, digital I & C, and human performance issues.
 - Continue emphasis on the use of quantitative measures for both operating and new reactors.

Considerations

- Commission direction to use same safety expectations as those for operating fleet (SRM/SECY-10-0121)
- Gap analysis performed identifying SDPs that need revision to accommodate new reactors
- Existing SDP program robust and inclusive – no new SDPs will be developed
- No deterministic SDPs require revision - design neutral
- SDP's for fire, operator requalification, steam generator tube rupture, Maintenance Rule, B.5.b and mitigating strategies are not affected
- SDPs for at-power, shutdown, containment and use of qualitative criteria need revision

IMC 0609 Appendix A

At-Power

- Only change to Appendix A will be new screening questions
 - Initiating Events, Mitigating Systems, Barrier Integrity
 - External Events
- Guidance for detailed risk evaluation, or go to IMC 0609 Appendix M

IMC 0609 Appendix M

Qualitative Measures

- Appendix M should be “a structured qualitative assessment for events or conditions that are not evaluated in the supporting risk models.”
 - Separate initiative to provide clarity on use of qualitative factors for operating reactors
- General structure similar to IMC 0609 Appendix M for operating reactors, but enhanced to:
 - Define clear entry conditions
 - Define and assess decision attributes
 - Integrate decision attributes

IMC 0609 Appendix G Shutdown

- General approach of existing Appendix G will work for AP1000
- No need for a Phase 2 procedure for AP1000's because generic shutdown SPAR model already exists for AP1000 that the SDP can use
- Procedures including IMC 0308 Attachment 3, Appendix G Basis Document, will be modified as needed to document differences, and how to address AP1000 for shutdown

IMC 0609 Appendix H Containment

- General approach of existing Appendix H will work for AP1000 with some modification
- A new plant type for AP1000 in Phase 1 screening and Phase 2 assessment will be added
- IMC 0308 Attachment 3, Appendix H Basis Document, will be modified as needed to document differences, and how to address AP1000 containment issues

PATH FORWARD

- Reach internal alignment on proposed changes
- Engage Commission on proposed changes (SRM/COMSECY-16-0022)
- Plans for public meetings and “tabletop exercise” workshops
- Planned completion date for SDP tools for new reactors – December 2018

Conclusions and Recommendations to the Commission

Dan Merzke

Staff Conclusions

- Maintain existing risk thresholds consistent with Commission guidance in SRM-SECY-10-0121.
- Preserve existing ROP structure.
- No changes to the assessment program are needed.

Staff Conclusions (cont.)

Performance Indicators

- Many of the PIs are based on regulations and standards that also apply to new reactor designs
- 12 of the 17 current PIs remain valid for the AP1000. The five PIs comprising the MSPI indicators would not be valid.
- The staff has identified no new PIs that would be effective in monitoring performance of the AP1000.
- Maintain existing PI thresholds pending staff evaluation after some operating experience is gained.

Inspection Program

- Few changes to inspection requirements, add guidance as necessary.
- Anticipate adjustments to sample sizes (risk importance and RTNSS).
- MSPI
 - IPs as written are sufficient to assess licensee performance in MS cornerstone without MSPI.

Significance Determination Process

- Existing SDP program robust and inclusive – no new SDPs will be developed.
- SDPs for at-power, shutdown, containment, and use of qualitative criteria need some revision.

Staff Recommendations

Recommendation: Commission approves the staff's plans to modify the ROP for new reactors as described.

Next steps

- Finalize Commission paper based on ACRS and stakeholder feedback
- SECY due to be issued in December 2017