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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

+ + + + +

DIGITAL INSTRUMENTATION AND CONTROL SYSTEMS

SUBCOMMITTEE

+ + + + +

WEDNESDAY

MAY 21, 2014

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ROCKVILLE, MARYLAND

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The Subcommittee met at the Nuclear
Regulatory Commission, Two White Flint North, Room
T2B1, 11545 Rockville Pike, at 8:30 a.m., Charles H.
Brown, Jr., Chairman, presiding.

COMMITTEE MEMBERS:

CHARLES H. BROWN, JR., Chairman

DENNIS C. BLEY, Member-at-Large

JOHN W. STETKAR, Member

STEPHEN P. SCHULTZ, Member

ACRS CONSULTANT:

MYRON HECHT

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1 DESIGNATED FEDERAL OFFICIAL:

2 CHRISTINA ANTONESCU

3 NRC STAFF:

4 STEVEN ARNDT, NRR

5 JOE ASHCRAFT, NRO

6 SUSHIL BIRLA, RES

7 STEPHANIE COFFIN, NRO

8 BERNIE DITTMAN, RES

9 JENNY GALLO, NRO

10 TERRY JACKSON, NRO

11 IAN JUNG, NRO

12 STEWART MAGRUDER, NRO

13 JAN MAZZA, NRO

14 TIM MOSSMAN, NRO

15 PAUL PIERINGER, NRO

16 PAUL PRESCOTT, NRO

17 DANIEL SANTOS, NRO

18 JOELLE STAREFOS, NRO

19 RICHARD STATTEL, NRR

20 DEANNA ZHANG, NRO

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ALSO PRESENT:

- BRIAN ARNHOLT, mPower*
- CHAZ FISHER, Generation mPower*
- GLENN LANG, Functional Design Services*
- STEVE POPE, B&W mPower
- CHET POSLUSNY, B&W mPower Licensing*
- STEVE SCHILTHELM, mPower*
- BOB SEELMAN, Westinghouse
- RUTH THOMPSON, Environmental Inc.*
- GORDY VYTLACIL, mPower*
- ROGER WYATT, AREVA*

*Present via telephone

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

PAGE

Opening Remarks

 by Chairman Charles Brown, ACRS.....5

Timeline for DSRS Chapter 7 (I&C) Effort

 by Joelle Starefos, NRO.....7

Public Outreach

 by Joelle Starefos/Ian Jung, NRO.....13

Background on DSRS Chapter 7 (I&C)

 by Tim Mossman, NRO.....20

Changes to DSRS Chapter 7 (I&C)

 by Tim Mossman, NRO.....47

Summary

 by Tim Mossman, NRO.....137

Path Forward

 by Tim Mossman, NRO.....137

Closing Remarks

 by Chairman Charles Brown, ACRS.....137

Q&A

 by Chairman Charles Brown, ACRS.....138

Adjournment

 by Chairman Charles Brown, ACRS.....144

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

2 (8:33 a.m.)

3 CHAIRMAN BROWN: The meeting will now come
4 to order. This is a meeting of the Digital
5 Instrumentation and Control Systems Subcommittee.
6 I'm Charles Brown, Chairman of the subcommittee.

7 ACRS members in attendance are Stephen
8 Schultz, John Stetkar, Dennis Bley and our consultant
9 is with us, Myron Hecht. Christina Antonescu of the
10 ACRS staff is the designated federal official for this
11 meeting.

12 The purpose of this meeting is for the
13 staff to brief the ACRS on draft final Design-Specific
14 Review Standard, Chapter 7 as part of the new licensing
15 approach for instrumentation controls for the Babcock
16 and Wilcox mPower SMR.

17 The subcommittee will gather information,
18 analyze relevant events, issues and facts and formulate
19 proposed positions and actions as appropriate for
20 deliberation by the full committee.

21 The rules for participation in today's
22 meeting have been announced as part of this notice of
23 the meeting, previously published in the Federal
24 Register on April 22, 2014.

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1 We have received no written comments or
2 requests of time to make oral statements from members
3 of the public regarding today's meeting. Also, we have
4 some people on the bridge line listening to the
5 discussions.

6 Those we know are Glen Lang from Functional
7 Design Services, Gordy Vytlacil, Brian Arnholt, Steven
8 Schilthelm, Ifti Ranna and Chaz Fisher of Generation
9 mPower, Chet Psolusny of B&W mPower licensing.

10 To preclude interruption of the meeting,
11 the phone line will be placed on listen-in mode during
12 the discussion, presentations and committee
13 discussions. Also, the bridge line will be open at the
14 end of the meeting to see if anyone listening would like
15 to make any comments.

16 At that time, whoever makes comments
17 should identify themselves by name when they announce
18 themselves. A transcript of the meeting is being kept
19 and will be made available as stated in the Federal
20 Register notice.

21 Therefore, we request that participants in
22 this meeting use the microphones located throughout the
23 meeting room when addressing the subcommittee. The
24 participants should first identify themselves and

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1 speak with sufficient clarity and volume so that they
2 may be readily heard.

3 We will now proceed with the meeting. I
4 call upon Ms. Joelle Starefos, Senior Project Manager
5 Small Modular Reactor Licensing Branch I in Division
6 of Advanced Reactors in Rulemaking in the Office of New
7 Reactors to start the presentation and introduce Ian
8 Jung.

9 MS. STAREFOS: Good morning. My name is
10 Joelle Starefos. I'm the Senior Project Manager in the
11 Office of New Reactors, and I've been responsible for
12 the NRC interactions on the mPower design since 2009.

13 During this extensive pre-application
14 period, the staff has focused on developing
15 infrastructure to review the mPower design, sort
16 application and risk-informed, effective and efficient
17 manner consistent with NRC regulations.

18 While developing the infrastructure
19 concepts that resulted in the DSRS, the staff
20 recognized this opportunity to pilot an effort to
21 streamline the guidance associated with the review of
22 the digital instrumentation and controls for new
23 reactor designs.

24 Today, the staff will present the time line

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1 for development of the DSRS Chapter 7, the staff's
2 effort to ensure public involvement, the objective of
3 this initiative, and then we'll summarize the formal
4 public comments and describe our responses to ACRS full
5 committee needing recommendations.

6 We'll also discuss in detail the changes
7 to DSRS Chapter 7 following our fall interactions with
8 the subcommittee in Fall 2013, no that's '12. Wow,
9 it's been almost two years.

10 (Laughter)

11 CHAIRMAN BROWN: That's enough time for us
12 to forget what we asked for.

13 MS. STAREFOS: We can help you out with
14 that. Section 7.2 on quality was developed after our
15 fall meetings with the ACRS, so we thought it would be
16 helpful to discuss that section in detail as well.

17 And then we'll wrap up with a summary and
18 discussion of our path forward for this portion of the
19 project. Next slide, please. This slide provides
20 some perspective on the evolution of the B&W Chapter
21 7 design-specific review standard.

22 You'll note that there are major
23 milestones on this slide, but for space reasons we don't
24 include an important initial milestone on February 10,

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1 2012, which represents the onset of this effort.

2 That was the date of our initial
3 presentation to the ACRS full committee, and I
4 described the vision for the effort. In Fall 2012, the
5 staff issued a substantial revision to Chapter 7 I&C
6 review guidance found in the standard review plan.

7 The staff developed guidance in the form
8 of the B&W mPower DSRS to incorporate lessons learned
9 and improvements from the reviews of the large
10 light-water reactor reviews that were performed in the
11 first several years of licensing when we became the
12 Office of New Reactors.

13 The intent of the restructured guidance
14 was to develop and pilot a review of the digital I&C
15 topics that showed a clear nexus from the regulatory
16 requirements to the review guidance, enhanced the
17 staff's review focus and proved the efficiency of the
18 review, reflected lessons learned from prior reviews
19 and leveraged the staff's cross-organizational
20 expertise.

21 In November and December of 2012, the ACRS
22 I&C subcommittee and full committee meetings were held
23 to discuss the Chapter 7 DSRS. After the ACRS meetings
24 the staff incorporated the ACRS comments along with

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1 comments received from NRR, NRO, Research and informal
2 public comments from the industry.

3 The staff also developed and incorporate
4 Section 7.2.1 entitled "Quality." On May 3, 2013, the
5 staff issued 154 sections of the mPower DSRS, including
6 Chapter 7, for formal public comment via Federal
7 Register Notice.

8 We received nearly 2000 comments on the
9 DSRS, 119 of those comments were received on Chapter
10 7. In the last eight or so months, the staff's been
11 busy reviewing, considering and resolving those formal
12 public comments.

13 During this time, the staff held a full day
14 public meeting specifically to discuss the DSRS I&C
15 topics. I'll provide more details on that on my next
16 slide.

17 The complete and current version of the
18 DSRS Chapter 7 I&C was provided to the ACRS on April
19 21, 2014, last month, in preparation for today's
20 subcommittee meeting. The changes resulting from the
21 staff's disposition of the formal public comments are
22 incorporated and shown as track changes.

23 The organization of this document remains
24 the same as presented you in 2012. However, 721

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1 quality was added to the document. Finally, this
2 version's been, has complete concurrence through the
3 NRO DE, Division of Engineering, division management
4 and has received no legal objection from our Office of
5 General Counsel.

6 A second document was provided in April as
7 well, a table that compiled all the formal public
8 comments received on Chapter 7 and the staff's response
9 to each of the comments. Next slide please.

10 MEMBER BLEY: Before you go on --

11 MS. STAREFOS: Sure.

12 MEMBER BLEY: It's been awhile since we've
13 talked. Can any of you provide us any clarity, is there
14 any clarity in the schedule going forward on the other
15 chapters? And with other potential designs coming in,
16 is there any, have you started thinking about DSRS for
17 other designs?

18 MS. STAREFOS: Stew, would you like to
19 take that?

20 MR. MAGRUDER: Sure. This is Stew
21 Magruder. I'm Chief of SMR Licensing Grants I at NRO.
22 As many of you know, B&W announced a slow down on the
23 mPower project. So we have put the other chapters for
24 the mPower DSRS on hold for now.

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1 New Scale has also been working with us to
2 develop DSRS. They also announced a delay in their
3 submittal of about a year, so we are continuing to work
4 on the New Scale DSRS.

5 However, consistent with what we did with
6 mPower, we're not going to publish the draft until about
7 a year before we think the New Scale application will
8 come in, so currently that would mean publishing a draft
9 for New Scale next summer because it looks as we're
10 expecting the new --

11 MEMBER BLEY: '15?

12 MR. MAGRUDER: Yes, the summer of '15.
13 Thank you. We're expecting the New Scale application
14 in late summer of 2016. Westinghouse had previously
15 told us that they were not interested in doing a DSRS.

16 And they subsequently backed off from
17 their SMR design. The other vendor that we've been
18 dealing with is Holtec. Holtec has said that they are
19 interested in a DSRS.

20 However, we have not had many substantial
21 meetings with them. And we have not really gotten
22 started on a DSRS for them. Our experience with New
23 Scale is that many of the sections do not need much
24 change.

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1 MEMBER BLEY: From the mPower?

2 MR. MAGRUDER: From the mPower design,
3 yes. And as we evolve, we'll see. We're expecting
4 that we'll be able to learn from what we've done on the
5 mPower DSRS, particularly Chapter 7 and incorporate
6 those changes in subsequent vendor DSRS.

7 MEMBER BLEY: We're really looking
8 forward to seeing some of the other chapters of any of
9 these whenever we can.

10 MR. MAGRUDER: Yes.

11 MEMBER BLEY: It would help us understand
12 where you're headed.

13 MR. MAGRUDER: Yes, we agree. We'd like
14 to share them with you as soon as we can.

15 MS. STAREFOS: Thank you, Stew. So we're
16 on the public outreach slide. It's Slide 4, but
17 unfortunately I had a problem with my page numbers here.
18 I apologize for that.

19 CHAIRMAN BROWN: They're not on the slide.
20 Is that what you're trying to say?

21 MS. STAREFOS: Well, actually, most of
22 them are, but when I was working on it last night I
23 couldn't figure out how to get Page 4 to come up. So
24 I apologize.

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1 CHAIRMAN BROWN: Okay. Got it.

2 MS. STAREFOS: My technical knowledge is
3 better than my ability to put page numbers on here. All
4 right, so Page 4. The public meeting held on November
5 14, 2003 focused a day on topics important to I&C.

6 The public meeting features NRC staff from
7 NRO research, NRR, NSIR. Multiple vendors were
8 represented at the meeting. Specifically in
9 attendance were B&W mPower and New Scale, the two SMR
10 designs that are subjects to the staff's developing
11 DSRS documents.

12 During the meeting, the staff reviewed the
13 new quality section at 7.2.1 and we had a discussion
14 on the controlled access that was jointly lead by NRO
15 DE and NSIR CSD organization.

16 The focus was to ensure that the potential
17 DC applicants understood that although adoption and
18 implementation of cybersecurity requirements would be
19 the responsibility of an eventual licensee, there would
20 be design decisions that vendors would make that could
21 set the licensee up for easier or more difficult time
22 in meeting the cyber requirements, particularly with
23 respect to establishment of a defense of architecture.

24 The hazard analysis section lasted the

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1 entire morning of the session with the focus being on
2 the staff's expectations for application submittal.
3 The staff noted that when the analyses are regularly
4 performed, that should support the hazard analysis.

5 However, there are certain areas that are
6 vulnerable to being underassessed by traditional
7 techniques. Now, let me turn over the discussion to
8 Ian Jung from the NRO division of engineering.

9 MR. JUNG: Good morning. My name is Ian
10 Jung, Chief of the Instrumentation Controls and
11 Electronics Engineering Branch II in the Office of New
12 Reactors. I just want to mention a couple things.

13 First of all, the staff really appreciates
14 the committee's advice and contribution to this
15 particular section of the DSRS. Throughout the
16 interactions for other light-water reactor reviews,
17 the committee has provided us the impetus to really work
18 on some of the areas.

19 And the staff took the advice seriously,
20 and this is one of the short-term results of that. And
21 the change in DSRS compared to current SRP, I just want
22 to show a visual expression of what it means to the staff
23 or newcomers.

24 This is the current SRP that's going to be

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1 without DSRS. It would've been handed out to the
2 staff. You figure out what's applicable to new
3 reactors. This is a new, this is sufficient by itself
4 without referring to SRP.

5 So all the redundancies, all the
6 replications, restructuring itself resulted in this.
7 And actually we added the sections like simplicity,
8 sections on hazard analysis.

9 So this is a significant improvement, yet
10 interesting thing is many of the guidance we already
11 had it. Many of the concepts and criteria were, are
12 in fact in this document.

13 But it wasn't laid out as clearly as we
14 hoped for because this is designed for previous
15 framework, license amendments and the system base
16 approach. As you know, most of the new reactors are
17 a lot more highly integrated.

18 Many of the system functions are not system
19 based. It is an integrated system, so this really
20 provides a better tool for the newcomers.

21 And the, one strong remark I want to make
22 is the structure here, the overall structure,
23 fundamental design principles that we start with and
24 all the system characteristics that follow.

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1 Overall structure really puts that
2 industry in a place where they should really focus on
3 what's really important for the safety. So one of the
4 several goals, but one of the key goals for the staff
5 was to focus on what's really important for safety
6 perspective.

7 So I just want to make that remark that the
8 committee has made a difference in providing us the
9 momentum to go forward with that. I just want to make
10 a brief remark on the 603 rulemaking that took place
11 yesterday.

12 So we have closely, of course for DSRS, as
13 the new regulation comes along with all of that, this
14 regulation is a guidance, yet part of the DSRS is
15 actually we couldn't find much of a difference from the
16 rule that's being proposed.

17 Actually, this is a guidance. We took the
18 freedom of guidance to really provide a guidance that
19 could be made for the staff and the industry that could
20 really make the design safe and our licensing review
21 process to be more efficient and effective.

22 So for independence, we had a lot of
23 discussion yesterday. We did a comparison, and
24 actually the mPower, it is essentially consistent with

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1 what the rule is being proposed.

2 So this guidance, if you look at it,
3 specific discussion on non-software based, hardware
4 based and all the languages are there. Eventually, we
5 might have to reconcile the definitions of all that
6 based on the rule process.

7 So we're going to continue to follow how
8 the rule goes, but from a guidance perspective it is,
9 in a way it's more of a pilot in some cases here. So
10 we took the freedom to go forward on some of this.

11 MEMBER STETKAR: But effectively you're
12 saying you're going to stick to the 1991 standard?

13 MEMBER STETKAR: Right now, yes.

14 CHAIRMAN BROWN: Okay. That was my
15 question.

16 (Laughter)

17 MR. JUNG: That is the current regulation.
18 It still has to go through public comments and all that,
19 so we don't want to --

20 CHAIRMAN BROWN: I guess my question was
21 a little bit, it's obvious if you go read what you read,
22 it's 1991 throughout the entire DSRS, which is, don't
23 have a problem with that because that's what the
24 regulations are right now.

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1 But since all of these SMRs, or at least
2 most of them, they seem to be pushing back in terms of
3 their time frame, I mean we had this discussion
4 yesterday.

5 And you look at all the other, that first
6 part of the rule change, which talks about what takes,
7 what they're going to do the designs to. It would seem
8 to make sense, at some point, that you would just
9 replace the 1999 with 2009, don't bother anything else
10 and let people complain afterwards if they think
11 there's an inconsistency.

12 But the new SMRs ought to really be
13 designed for the most recent regulation, once it gets
14 published.

15 MR. JUNG: I just think the industry
16 understands that, and as you've noticed there's an
17 applicability table yesterday.

18 And some of the, these small modular
19 reactor designs coming in, according to the timetable
20 right now we have, for design certification regulation,
21 before the design is certified, they're supposed to
22 meet the most recent regulation at the time of the
23 certification, not at the beginning.

24 Therefore, it's highly likely that they'll

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1 have to use it. And even beyond the regulation,
2 generally the staff has been expressing it's an
3 industry practice to use the most recent consensus
4 standards if that really provides the basis for
5 performance to the underlying regulation.

6 You don't have an objection to that, but
7 that there's of course some legal exemptions or
8 alternative that might come along --

9 CHAIRMAN BROWN: I understand.

10 MR. JUNG: -- from a pure safe design
11 perspective. Of course it's a good practice to use
12 most recent standards out there.

13 CHAIRMAN BROWN: Okay. Thank you.

14 MEMBER SCHULTZ: Was this discussed in the
15 workshop that was held?

16 MR. MOSSMAN: No. We didn't talk about
17 the, at that time, I think we were still targeting mid
18 this year for the mPower submission. So 1991 would've
19 still be in effect.

20 MR. JUNG: From workshop, I just want to,
21 the workshop was not the only interaction with an
22 applicant. We have met with the potential applicants
23 in a number of cases on other topics, D3 and other areas.

24 So in those settings, we've discussed

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1 there's the existence of rulemaking and it's potential
2 impact it may have on them.

3 MEMBER SCHULTZ: Thank you.

4 MR. JUNG: So with that, I'd like to turn
5 it over to Tim Mossman.

6 MR. MOSSMAN: Thank you, Ian. My name is
7 Tim Mossman. I currently serve in the Office of New
8 Reactors, the Instrumentation and Controls Branch II
9 under Ian.

10 Also with me today is Joe Ashcraft, who is
11 one of our senior engineers who has logged a significant
12 amount of time on the development of the DSRS Chapter
13 7.

14 Before I begin, I just wanted to note, I
15 think as most everybody knows, that this subcommittee
16 was previously briefed on the DSRS Chapter 7 by Milton
17 Concepcion, who along with Joe and many of the other
18 I&C staff in this branch did much of the hard work on
19 this document.

20 Milton has since left the agency for a
21 position in the private sector, but has been generous
22 with his time where, in a couple of instances where
23 we've had questions about history.

24 In addition, I wanted to point out that our

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1 project managers in the Division of Advanced Reactors
2 and Rulemaking have provided a significant amount of
3 support to the development of this section and also us
4 getting ready for this presentation today.

5 In fact, they also helped us significantly
6 with the production of the workshop that we held in
7 November. Also, a couple other people in the audience,
8 Sushil Birla from research has been instrumental in
9 this on hazards analysis and continues to do so.

10 Paul Pieringer in the back who's now back
11 in human factors provided a lot of support in starting
12 our development of interfaces with our review sections.
13 So, and later today Paul Prescott will be here from the
14 quality assurance, vendor quality branch.

15 And we've been working with them fairly
16 heavily on the quality section. Since ACRS has
17 previously been briefed on Chapter 7 of the DSRS, we
18 only included a brief overview of the major changes to
19 the I&C section from the old SRP.

20 The primary focus of the change was to
21 reorganize the SRP content from a system focus to focus
22 more on I&C design principles and design attributes in
23 the DSRS.

24 CHAIRMAN BROWN: Are you talking about

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1 from the last time we reviewed this?

2 MR. MOSSMAN: No, from, this is the --

3 CHAIRMAN BROWN: You're talking about the
4 background, background?

5 MR. MOSSMAN: Yes, this is super
6 background.

7 CHAIRMAN BROWN: Okay.

8 MR. MOSSMAN: I just didn't --

9 CHAIRMAN BROWN: I was going to say --
10 (Crosstalk)

11 MR. MOSSMAN: I didn't know who would be
12 in this live studio audience, maybe --

13 (Crosstalk)

14 CHAIRMAN BROWN: 7.1 was virtually
15 identical. 7.2 got a little bit difficult to do a
16 paragraph by paragraph check quickly, but there didn't
17 seem to be a whole lot of changes even relative, a quick
18 look at the public comments didn't seem to be that they
19 would really change the thrust of anything. Is that
20 correct?

21 MR. MOSSMAN: In fact, we can hop to Number
22 6.

23 CHAIRMAN BROWN: No, go ahead. I don't
24 want to get out of sync. I just want to make that one

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1 observation just to make sure my calibration was
2 correct.

3 MR. MOSSMAN: Yes, exactly correct.

4 CHAIRMAN BROWN: Okay.

5 MR. MOSSMAN: Exactly correct.

6 CHAIRMAN BROWN: Made no changes to the
7 control of access section based on all the multiple
8 interchanges of correspondence that we've had. Okay.

9 MR. MOSSMAN: Yes.

10 CHAIRMAN BROWN: I just wanted to say that
11 for the record.

12 MR. MOSSMAN: I would've been
13 disappointed if you didn't.

14 (Laughter)

15 CHAIRMAN BROWN: I want to make sure my
16 reputation continues, the pitbull approach to
17 business.

18 MR. MOSSMAN: In addition, in the DSRS
19 staff to the opportunity to remove redundant staff
20 guidance and non-applicable information that may have
21 been contained in the SRP, for example, references to
22 IEEE 279, which won't apply to newer designs.

23 Staff also had a number of lessons learned
24 from other design certification reviews, and we

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1 attempted to reflect those in the DSRS Chapter 7
2 guidance.

3 One of the key lessons learned resulted in
4 the staff including appendices on hazards analysis,
5 systems architecture and simplicity, which we expect
6 will enable applicants to better communicate their
7 designs to the staff.

8 Go to the next slide. As Joelle
9 mentioned, we did receive public comments on the
10 document, approximately 2000 total on the overall DSRS,
11 119 of those comments were directed to Chapter 7.

12 Generation mPower, NEI and New Scale
13 provided the majority of the public comments on Chapter
14 7, with one comment submitted from an individual with
15 IAEA.

16 While the majority of the comments were
17 editorial in nature, and we accepted the vast majority
18 of those, we did receive approximately three dozen
19 technical comments.

20 About half of the technical comments
21 simply requested clarification on positions or
22 statements in the DSRS, which I think we were able to
23 provide. Staff did not consider any of the technical
24 comments to be showstoppers.

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1 And none of the resulting comments
2 resolutions altered the staff's approach to Chapter 7.
3 If there's any particular public comment you'd like to
4 discuss or have any questions about, we'll be happy to
5 --

6 CHAIRMAN BROWN: Well, my question was
7 relative to was there one that changed the technical
8 thrust that wasn't obvious from reading that in the
9 documents or wasn't obvious at all?

10 MR. MOSSMAN: No, I think we felt like with
11 a lot of the pre-engagement of other staff, the ACRS
12 and other stakeholders, that by the time it went out
13 for public comment I don't think there were any major
14 disconnects.

15 CHAIRMAN BROWN: Okay.

16 MR. JUNG: Also, if you looked at the
17 timeline earlier, there was an earlier informal draft
18 that was issued for comments as well, which was already
19 addressed.

20 CHAIRMAN BROWN: Is this before we did our
21 initial review?

22 MR. JUNG: That's correct.

23 CHAIRMAN BROWN: Oh, okay.

24 MR. JUNG: So the number of comments that

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1 we received even internally before we even drafted
2 them, the one that was issued for early draft, we had
3 interaction within ACRS. Many of the comments were
4 addressed throughout that.

5 CHAIRMAN BROWN: Okay.

6 MR. JUNG: And then, of course let's say
7 matter of clarification editorial, most of them are
8 editorial in nature.

9 MEMBER STETKAR: I think it's a change.
10 I'm just doing a comparison. In the introduction now
11 you introduce the notion of the four categories of SSCs,
12 A1, A2, B1, D2. That was not in the previous version
13 we looked at it November. It wasn't.

14 MS. STAREFOS: That's correct.

15 MEMBER STETKAR: November 2012.

16 MR. MOSSMAN: Okay.

17 MEMBER STETKAR: And as I read through
18 that, I'm troubled by something. Maybe you can help
19 me sort it out. A1, just for the record, A1 is
20 safety-related, risk significant. A2 is
21 safety-related, not risk significant.

22 B1 is not safety-related, risk
23 significant, and B2 is not safety-related, not risk
24 significant. As best as I can tell by the guidance,

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1 you apply the same review guidance for A1 and A2. Is
2 that correct?

3 MR. MOSSMAN: Yes, that's correct.

4 MEMBER STETKAR: And you apply enhanced
5 guidance for the review of B1 compared to B2. Is that
6 correct?

7 MR. MOSSMAN: Yes.

8 MEMBER STETKAR: It seems to me that the
9 staff is now doing more review in a risk informed
10 perspective that they are doing currently, which does
11 not seem to be consistent with the principles of a risk
12 informed review process.

13 In other words, it would strike me that
14 less review attention ought to be applied to
15 safety-related, not risk significant compared to
16 safety-related, risk significant.

17 And I'd need to sort out in my own mind how
18 I balance A2 versus B1. But it sounds like the staff
19 is planning to do more in depth review of this because
20 it's now risk informed, compared to what you do
21 currently, which does not seem to be consistent with
22 the basic principles that we were talking about.

23 MR. JUNG: Yes, if you look at the second
24 paper the goal was clearly efficiency and effective

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1 review. Previous reviews without that impetus, I'll
2 call that, the B1 category was still reviewed.

3 Without clear direction of what to rely on
4 this is more indicated, you could, in those areas you
5 can rely on programmatic requirements. What I'm
6 saying, John, is it was still up to individual reviewers
7 to make judgments on them. It was necessarily
8 efficient.

9 MEMBER STETKAR: I'm not arguing with some
10 level of enhanced review of B1 versus B2. What I am
11 asking about is why are we doing the same level of review
12 of A1 and A2. Why are we not --

13 (Crosstalk)

14 MEMBER STETKAR: Why aren't we backing off
15 of A2?

16 MR. JUNG: There's some history to it.
17 This particular approach has come up, and it came up
18 yesterday in brief conversation that, John, we read it.

19 Basically, we don't use, going back the
20 reliability analysis that we came up yesterday, the
21 complication of reliability assessment or PRA, you call
22 it, of the digital systems has been very difficult.

23 MEMBER STETKAR: Let me stop you because
24 you're giving me a lot of history. We are changing the

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1 way that we think about performing these reviews. It's
2 not simply digital. It's a risk-informed process for
3 allocating structures, systems and components.

4 MR. JUNG: I understand.

5 MEMBER STETKAR: They could be check
6 valves. They could be little widgets in some
7 instrumentation control system. They could be the
8 containment building.

9 There's a risk-informed prioritization
10 now that says you use risk information to categorize
11 SSCs now into four categories, A1, A2, B1, B2. Okay?
12 That's the principle that is now being promulgated, I
13 thought, throughout this review process.

14 So I don't care how people did it in the
15 past. This is going forward with this soft of
16 framework.

17 MR. JUNG: I'm just questioning. Other
18 staff talked about it. We struggled with it. It's an
19 issue of a practicality. Is it going to make our review
20 more efficient or not? You have to rely on Chapter 9,
21 10.

22 Immediately it poses an interface issues,
23 and the next question is going to come up that we need
24 to be, instead of addressing if there are certain

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1 determinants to criteria that's in place, we could,
2 let's say you could take 60 hours to review.

3 Versus now, there's interface
4 requirement. There's going to be PRA assessment that
5 requires a PRA quality. PRA quality has a lot to do
6 with the PRA modeling of the digital systems.

7 It has been proven to be very difficult.
8 National Academy of Science 1997 study says that. It
9 should be modeled in PRA, but practicality of the
10 application is not there.

11 So it is one of those areas, John, that I
12 fundamentally agree with you, the use of risk result
13 would provide same in terms of doing less, yet for this
14 particular discipline it is not that simple.

15 And if there's a solution somebody in the
16 Chapter 19 comes with the four days digital components,
17 our systems are less significant. If that distinction
18 is clearly made to us, we could entertain it. But we
19 haven't seen that yet.

20 MEMBER STETKAR: Ian, this is guidance for
21 review. It isn't, doesn't tell me how many significant
22 figures I need on my calculator to determine how much
23 money is in my bank account.

24 That's a different issue. This is

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1 guidance for review. The guidance is laid out in the
2 construct of these four different classifications.
3 That's the way the guidance lays it out.

4 It says that an applicant categorizes
5 things. In your particular discipline they happen to
6 be I&C things, but throughout the entire process, the
7 applicant categorizes things according to these four
8 different categories and that the review is structured
9 according to those categories.

10 It's a risk-informed review process. And
11 I don't, other than increasing the attention of B1
12 versus B2, which I agree with B1 versus B2, it does not
13 decrease the level of effort of A1 versus A2.

14 A completely risk insignificant thing just
15 because it's called Ralph or given the name
16 safety-related is given every bit as much attention and
17 effort in the review process as something that's called
18 Ralph, safety-related and identified as risk
19 significant. And that doesn't seem that it's done with
20 the general framework.

21 MR. JUNG: My response to that is if you
22 come out of it, the way this is designed, the overall
23 step review right now is focusing on fundamental design
24 principles.

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1 It lays out to the staff which area to
2 focus. In doing so, I think there is, I strongly
3 believe it's going to provide significant efficiency.

4 And even without the A1, A2 distinctions
5 for this particular discipline, and in previous large
6 and light-water reactors, Chapter 9 can provide us with
7 the actual risk insights report for the staff review
8 for I&C systems given highly integrated nature of that,
9 of course, none of the PRA B

10 MEMBER BLEY: Let me jump in. If all
11 that's true, then I would think one would argue that
12 if you do A1 and B1 the same and if you had to because
13 these systems are so complex, maybe A2 as well.

14 If you're building this structure
15 supposedly risk-informed, the risk significant things
16 are more important than that things that aren't risk
17 significant. So the way you've structured your
18 explanation is counter to that.

19 And that just doesn't make a lot of sense
20 to us. And I just have a little simple aside. I wonder
21 why you changed the names from the names that are in
22 50.69. Is it just to make things more confusing to the
23 world or what?

24 MR. JUNG: It's not something that this

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1 particular discipline came up with this notion of all
2 these categories.

3 MEMBER BLEY: Well, I mean 50.69 has the
4 same four categories. They call them Risk 1, 2, 3 and
5 4, and they order them in the way John's been
6 recommending you think about them.

7 MS. STAREFOS: Can I --

8 MEMBER STETKAR: I mean the agency has
9 thought through this process before. It's, to me,
10 amazing that the I&C folks decide that they need to
11 rethink it and then justify not applying it, quite
12 honestly, on the record.

13 MS. STAREFOS: I understand your comment.
14 This is Joelle Starefos. There's a couple of things
15 that happened historically here. One, we were asked
16 by the commission to risk-inform our SMR guidance.

17 And we approached that by developing
18 Introduction 2 to our standard review plan, which
19 allowed us to develop these design-specific review
20 standards. And you've already heard from the staff on
21 how we approach that.

22 And it talks a little bit about this A1,
23 A2, B1, B2 approach. The reason that we basically,
24 it's not 50.69. What it is is the same four categories,

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1 and you can only slice and dice them, same two
2 categories or pieces, safety and risk.

3 And you can kind of only slice and dice that
4 a couple different ways, so what we wanted to do in this
5 case was to allow the staff to have some kind of
6 structure that they could right size their review or
7 focus on the risk significant items above the non-risk
8 significant items.

9 In light of the fact that we also have our
10 safety-related categorization, we couldn't ignore that
11 as an agency. We didn't want to ignore that as an
12 agency. So that's how we structured this approach to
13 the small modular reactor guidance.

14 MEMBER STETKAR: I recognize the notion of
15 some arbitrary designation of something called
16 safety-related. I accept that notion. It's
17 ingrained in the system.

18 However, that does not of necessity mean
19 that I as a reviewer need to spend 100.00 hours on
20 something that is safety-related and tick off every
21 single box in all of those review categories simply
22 because something is called safety-related.

23 Perhaps I don't need to tick off some of
24 those boxes if it happens to be called safety-related

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1 but is deemed not risk significant. Why should I waste
2 my time as a reviewer and the applicant's time answering
3 a heck of a lot of questions about something that is
4 agreed to be not important to risk?

5 I just don't understand it, simply because
6 it's got a label put on it.

7 MEMBER BLEY: And to me, this isn't 50.69.
8 The treatment's different. You're looking at
9 different things. The categories are the same. The
10 concepts ought to be same, and one of them says Number
11 1 on your list is safety-related and risk significant.

12 Number 2 is not safety-related and risk
13 significant, and Number 3 is not safety-related, no
14 safety-related, not risk significant. And Number 4 is
15 neither one.

16 The other one flips that around for no
17 explained reason, and to me, there is no explainable
18 reason to flip them around. You have to maintain
19 something for safety-related.

20 I mean there's a tradition, but we want to
21 give people some idea of how to allocate, and I don't
22 get why you allocate more to something that's not
23 important to risk than something that is.

24 MEMBER STETKAR: It not only flips it

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1 around --

2 MEMBER BLEY: And it's contradictory to
3 the way other regulations are set up, so --

4 MEMBER STETKAR: It doesn't only flip it
5 around. It says that the distinction between A1 and
6 A2 doesn't matter. There is none. You go through the
7 process of allocating something to A2.

8 And then it doesn't matter. Every
9 safety-related piece of equipment could be called A2,
10 or every piece of safety-related equipment could be
11 called A1. It wouldn't make any difference to the
12 review effort. That's the way this reads.

13 MEMBER BLEY: And I'm still hanging on
14 50.69. It says A1, B1 get treated the same. A2 gets
15 treated pretty well but not as strongly as those two.
16 It's an inconsistency that is not explained. And so
17 far you haven't explained it in a way that seems
18 coherent to me.

19 MS. COFFIN: Just a suggestion, this is
20 Stephanie Coffin. I'm the Acting Deputy Director in
21 the Division of Engineering, understand your comment.
22 It's not unique to this chapter. And I suggest we'll
23 take it back, think about it and --

24 (Crosstalk)

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1 MEMBER STETKAR: This is one of the
2 reasons, I mean this happens to be the first chapter.
3 It's a difficult issue to address.

4 MS. COFFIN: And it's good to hear it now.

5 MEMBER STETKAR: One can question on a
6 different perspective whether any safety-related I&C
7 system would, the SSCs in practice would actually fall
8 into an A2. But that's a different issue.

9 That's my level of precision in my
10 calculator. We let the math or the allocation process,
11 either quantitatively or with expert elicitation,
12 verdicts and things like that. We'll let them work
13 that out, but it --

14 MS. COFFIN: Appreciate the comment.

15 MEMBER STETKAR: -- has to pervade
16 throughout all of the other areas.

17 MS. COFFIN: Ian or Tim or Jo, unless you
18 have something else to add, I --

19 MR. MOSSMAN: Yes, I was just going to --

20 MS. COFFIN: We understand their
21 position, the point they're trying to make.

22 MR. MOSSMAN: I was just going to say as
23 a reviewer I am very sympathetic to your comment.

24 MEMBER STETKAR: And I am sure the

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1 applicants are also.

2 MR. MOSSMAN: Yes.

3 MEMBER STETKAR: I mean if there's any
4 benefit to be obtained from this risk-informed, graded
5 approach to review, it can benefit both the reviewers
6 and the applicant. I mean I as an applicant don't want
7 to be bothered answering endless rounds of RAIs on
8 something that we all agree isn't important to risk.

9 MR. MOSSMAN: Agreed.

10 MEMBER SCHULTZ: As you said John, the
11 process will sort out where these categories fall in
12 terms of level of importance. But if the process at
13 first is set up in an inconsistent manner --

14 MEMBER STETKAR: That's right. The
15 framework of the guidance has to be set up, and if it's
16 done so because well, this is a special case, then.

17 And it's based on historical ways that we
18 do things versus the way we're trying to reorganize the
19 system, then we're setting ourselves up for failure not
20 only in this category of work but most likely for
21 categories that follow.

22 MR. JUNG: Understand. I think maybe we
23 are too hung up on previous --

24 MEMBER STETKAR: I think we've made our

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1 part. One thing, if we pass through the ranting about
2 the general stuff, may I have the floor please?

3 CHAIRMAN BROWN: What if I said no? You
4 would take it anyway.

5 MEMBER STETKAR: That's right.

6 FEMALE PARTICIPANT: Don, did you want to
7 say something?

8 MR. SANTOS: Mr. Chairman, can I say
9 something?

10 CHAIRMAN BROWN: Yes, sure.

11 MR. SANTOS: Excuse me. I'm a bit under
12 the weather. I have a point to make and maybe a
13 clarification.

14 While understanding the different
15 meanings and the move to a risk-informed operation, we
16 got to recognize with these new highly integrated
17 systems underway that have been presented to us of the
18 high levels of interconnectivity, the hidden
19 dependency or independence issues associated with
20 interconnecting safety or non-safety or risk or in
21 risk, less significant system may outweigh the
22 classification or division classifications we might
23 put in.

24 So we got to be careful with that point.

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1 Also, while we're looking at the issue of efficiency
2 and review, which I understand, we got to be careful,
3 and we have to understand is it also the members'
4 expectation that the developers apply less rigor to a
5 safety-related, less risk significant development
6 process.

7 CHAIRMAN BROWN: For the uninitiated like
8 me, which I'm not a risk guy, it sounded like the
9 answer's yes. But I am, I wouldn't say that
10 absolutely. You have to use your head when you're
11 looking at the non-significant relative to the level
12 of integration into the safety-related significant
13 stuff.

14 MEMBER STETKAR: And we've had a bit of
15 this conversation in other subcommittee meetings where
16 we talked about, and Charlie, you're going to have to
17 help me out here. There are, is it IEEE that has the
18 different --

19 CHAIRMAN BROWN: Levels?

20 MEMBER STETKAR: Yes, the different
21 integrity levels.

22 CHAIRMAN BROWN: Integrity levels, yes.

23 MEMBER STETKAR: So one could --

24 CHAIRMAN BROWN: It's the software

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1 integrity levels.

2 MEMBER STETKAR: Yes, but I mean the same
3 principle applies. One could apply a graded approach
4 to the integrity levels such that A1 gets, I forgot what
5 is, Level 4 I think it is.

6 And A2 might get Level 4- or Level 3++ or
7 something like that. And B1 might get Level 2 Star or
8 something like that, that one can see ways of doing
9 that. I mean there is a structure without completely
10 abandoning all hope, if you will, or quality for the
11 things that are designated safety-related.

12 MEMBER BLEY: And I think nobody would
13 object. And it might be, given the integration, that
14 there are times. You really can't parse these things
15 out. If that's true, then at least the top three ought
16 to be treated the same and maybe all four of them have
17 to be treated the same because you can't separate it.

18 That's a practical side. What we're
19 talking about here is a philosophy that's laid out in
20 the document.

21 CHAIRMAN BROWN: I want to try to get to
22 the point so we can move on. You're fundamentally, if
23 I understand what you guys are saying, is that the
24 statement in here that A1 and A2 will get a very detailed

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1 review.

2 B1, which is more highly risk significant
3 is subdued, something, and Dan is commenting that
4 because of the change in the nature of the stuff, the
5 way these plants are integrated, the SMRs, from what
6 we witnessed on the large power reactors, that we may
7 not be able to be that, just divide them up the way and
8 put the B1 ahead of A2.

9 And your argument is this is absolutely
10 telling the reviewer how to go do that as opposed to
11 providing --

12 MEMBER BLEY: Almost Charlie, what we're
13 saying is if you can parse them, then we're saying the
14 order that it's given is wrong.

15 MEMBER STETKAR: And as a practical matter
16 --

17 CHAIRMAN BROWN: If you can parse them,
18 right?

19 MEMBER SCHULTZ: But you don't decide a
20 priori that you're going to --

21 CHAIRMAN BROWN: I agree with that. You
22 shouldn't just blanket blinders on go do that. You
23 ought to look at each thing relative to how --

24 MEMBER STETKAR: But Charlie and Dan, in

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1 practice people will parse them. They will have a set
2 of things, as an applicant, that I am designating
3 safety-related because those things, according to our
4 licensing framework, and we're not go so far as to
5 completely change all that.

6 Those are the things for which credit is
7 taken in the Chapter 15 accident analyses by, at least
8 under our current licensing framework. Those are
9 safety-related. Everything else is not
10 safety-related.

11 Now there might be a lot of crosstalk
12 between that stuff, but eventually an applicant will
13 come in and say this is safety-related because I took
14 credit for it in my Chapter 15 accident analyses.

15 And this is not. So this determines the
16 distinction between what's in Column A and what's in
17 Column B. As I said, there may be a lot of crosstalk
18 between those two.

19 But the guidance does talk an awful lot
20 about those interfaces, how the reviewer is supposed
21 to look at those interfaces. But that again, as Tim
22 just mentioned, that's a different issue than what
23 we're talking about.

24 CHAIRMAN BROWN: On a global basis, one of

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1 the things in my own mind, but I'm trying to use you
2 all's thought process in terms of the risk approach,
3 that I've been trying to take for the last five or six
4 years is when we do these I&C reviews, what are the most
5 critical items?

6 Forget the piece parts inside. It's the
7 fundamental architecture. It's the independence.
8 It's the how the data's processed, and it's now
9 controlled access. What are the three barrier areas
10 that we have to, that's a high level breakout.

11 I don't want to call them A1, A2, but when
12 you work underneath that, and you say okay. What are
13 the exceptions to this thing? How do I balance those?
14 This is no different.

15 And they structure, they've taken our
16 advice to heart relative to the fundamentals. Very
17 good. I mean Section 1, very good relative to
18 addressing the fundamentals of reliable and safe I&C.

19 And then you pick up details back here, and
20 I just, I think it fits. I agree that you shouldn't
21 absolutely say A1 and A2 will always have whatever.
22 You ought to use your head.

23 MR. JUNG: We understand, and we'll take
24 it back.

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1 MEMBER STETKAR: Let me try and, just one
2 other item that I wanted to mention on this while we're
3 on the A/B topic.

4 And then I'll be quiet. Right now the way
5 that the guidance is set up is there's a very strong,
6 not exclusive, but a very strong emphasis on populating
7 Category B1 with what had traditionally been called
8 RTNSS items, regulatory treatment of non-safety
9 systems.

10 And there's a, I have to be careful in my
11 language here. There's, there are criteria that have
12 been applied to what is defined as RTNSS A, B, C, D and
13 E. Most criteria in many cases are reactive criteria
14 to events that have occurred.

15 For example, by definition, things that
16 are for ATWS mitigation, by definition, are RTNSS
17 regardless of their risk significance. Things that
18 are responsive to a particular regulatory
19 interpretation of something that's called a station
20 blackout are by definition RTNSS.

21 Some of the other categories are a little
22 bit more general. My concern is that here again we're
23 relying on a compartmentalized reactive set of criteria
24 for populating something that is supposed to be risk

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1 informed.

2 In other words, if something is non-safety
3 related, I'll give you the two columns. But within the
4 non-safety related column, if something is important
5 to risk, it ought to be in B1.

6 And if something is not important to risk,
7 it ought to be in B2 even though historically it might
8 have satisfied the criteria being called a RTNSS A, for
9 example. Those categories, in this broader context
10 really don't have any regulatory meaning anymore.

11 So as you're thinking through this
12 process, because there is quite a bit of discussion
13 about the B1 category and how it's treated, it does say
14 other things might be in B1 in addition to RTNSS.

15 But it's clear that anything that
16 traditionally was called RTNSS will be in B1. And that
17 also is kind of contrary to this broader perspective,
18 so you may want to rethink that.

19 MR. JUNG: I understand.

20 MEMBER STETKAR: Can I proceed now?

21 CHAIRMAN BROWN: Yes, please. I have
22 been given permission by my colleagues. Go ahead Tim.

23 MR. MOSSMAN: I would just say I
24 appreciate all the comments, and this is an area where

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1 I think when we get the opportunity to test drive this
2 guidance, I think it'll be very interesting to see
3 because I think at this point I'm not sure we have any
4 preconceived notions.

5 If we're going to have zero or ten A2
6 systems or one or 20 B2 systems, and so we don't know
7 the magnitude of what we're really going to come up with
8 yet.

9 MEMBER STETKAR: And you don't know, and
10 that breakdown may be very different depending on
11 whichever part of the review you're talking about.
12 Whether I'm talking about check valves in some cooling
13 water system or whether I'm talking about digital I&C.

14 MR. ASHCROFT: One of the things the
15 structure's going to help us with, it's going to make
16 them identify upfront in Chapter 7 of what they are
17 where they are as opposed to in the old days chasing
18 it by putting another chapter, so just from that
19 standpoint alone.

20 MEMBER STETKAR: It enforce a discipline
21 both ways, and that I think is one of the incentives
22 for developing this whole process.

23 MR. MOSSMAN: Next, we're going to walk
24 through the formal recommendations received from the

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1 ACRS on Chapter 7 of the DSRS and the staff's approach
2 to the resolution. The first two, we'll start off with
3 the easy ones.

4 The first recommendation was fairly
5 self-explanatory, which was to release the Chapter 7
6 for public comment. We did that, and we just provided
7 an overview of the 119 comments we got, Chapter 1.

8 Next one, Recommendation 2 was an ACRS
9 recommendation that the review standard is likely
10 applicable to other designs. And in our letter back
11 to the ACRS on February 6, 2013, we agreed with the date
12 of the application of the B&W mPower design being
13 uncertain at this time, the staff is considering other
14 opportunities to use this guidance.

15 We are interested in giving it a good pilot
16 run. However, those opportunities will need to be
17 identified on a case-by-case basis. It's possible the
18 guidance may be migrated from the mPower DSRS to another
19 DSRS and/or other guidance documents as appropriate.

20 CHAIRMAN BROWN: My only question on that
21 is, obviously I read the letter that responded. When
22 we reviewed and went back through this I kept looking
23 for where did these Section 7.0, 7.1, 7.2, where did
24 they seem to be not generally applicable to anything.

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1 This almost doesn't point to specific
2 design stuff in mPower at all. They're fundamentally,
3 I would use these principles in any design development
4 that I was doing.

5 MEMBER STETKAR: Well, there's still a
6 statement in there that I highlighted that says if the
7 final design comes in, this is now mPower, that,
8 something to the effect that if it's not consistent with
9 assumptions that the staff has made regarding the
10 mPower design, you need to rethink things, basically.

11 But it's not clear what those, it's sort
12 of --

13 CHAIRMAN BROWN: I'm not saying you never
14 think about what you're doing. It's just --

15 MEMBER STETKAR: No, but I mean it's clear
16 what mPower specific assumptions went into this
17 guidance other than the fact that it's PWR, and that
18 seemed to be about it.

19 MR. MOSSMAN: Yes, I think I can give you
20 an example. I think one of our earlier actions was we
21 understood that they were not going to have non-safety
22 to safety connections.

23 And so we did not build in a lot of the
24 ISG-04 guidance as to what constituted sufficient

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1 independence, if you had those kind of connections.

2 CHAIRMAN BROWN: I missed that.

3 MR. MOSSMAN: But if somebody eventually
4 comes in and they want to do that, well I'd have to go,
5 we have other guidance on the books that allow me to
6 review that. It's more painful, but --

7 CHAIRMAN BROWN: I didn't realize that.
8 I didn't know. That's good though. I don't know.

9 MR. JUNG: Even with that, we are still
10 talking about independence, the underlying --

11 (Crosstalk)

12 MR. JUNG: -- all described in the
13 regulation.

14 CHAIRMAN BROWN: All right, go ahead.
15 Thank you for that.

16 MR. JUNG: I'm just agreeing that we've
17 been communicating to other customers --

18 (Crosstalk)

19 CHAIRMAN BROWN: But when you said that
20 you didn't build in some of the ISG stuff relative to
21 safety-related to non-safety related connections or
22 non-safety to safety.

23 MR. MOSSMAN: Now if they come in and
24 submit something that has that, it's not illegal for

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1 them to do so. I have other guidance. It's just a lot
2 longer process to go through.

3 MEMBER SCHULTZ: Is that incorporated as
4 a note or a remark that we missed or --

5 MR. MOSSMAN: I did get a public comment
6 on that, and I did put a note in there saying --

7 MEMBER SCHULTZ: Thank you.

8 MR. MOSSMAN: -- that if somebody does
9 that, staff would have to go to other guidance.

10 MEMBER SCHULTZ: Good to capture that.
11 Thank you.

12 MR. MOSSMAN: Recommendation Number 3,
13 and I forget who specifically brought this up. It
14 concerned ACRS' position on control of access.

15 (Laughter)

16 MEMBER STETKAR: The committee writes
17 letters as a whole. The entire committee brought this
18 on.

19 MR. MOSSMAN: Staff acknowledged the
20 committee's concern and recognizes the issue addressed
21 by the ACRS recommendation. Number 3 has wider
22 applicability than just to the mPower design and its
23 corresponding DSRS.

24 As such, as detailed in the staff's letter

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1 to the ACRS dated April 3, 2014, the staff intends to
2 develop a correspondence to the commission to seek
3 their guidance on how to proceed with this issue.
4 We'll continue to keep ACRS informed as to our progress
5 on this correspondence.

6 CHAIRMAN BROWN: Okay. I have an
7 observation as you're well aware. You were at the
8 meeting yesterday.

9 MR. MOSSMAN: Yes.

10 CHAIRMAN BROWN: And I think most
11 everybody except for Stew, were you here yesterday?
12 You really missed some fun --

13 (Laughter)

14 CHAIRMAN BROWN: Saying I'm going to
15 prepare a SECY paper and send it up to the commission,
16 it's kind of like taking a major issue that occurs in
17 the major political and say we're going to have a
18 hearing, or we're going to go do an investigation by
19 the Inspector General and then you never hear anything
20 for five years.

21 It's just like putting it into a black
22 hole, so I have, while I understand, I read your letter.
23 And it was, I'm not going to categorize it, but it just
24 effectively left everything at a static condition.

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1 And I guess we'll have to address how we
2 want to deal with that, which putting this thing off
3 when it's very clearly covered in both of the rules that
4 it currently, the existing rule as well as the rule
5 that's being proposed. The words are the same if
6 nothing else happened.

7 MEMBER BLEY: I guess I would like to add
8 to Charlie's because the Chapter 7 you've got here, I
9 fully expect to be the model not just the next DSRS,
10 but I think eventually much of this is going to go back
11 into the basic Chapter 19.

12 So it's a perfect opportunity to put it in
13 here, and it won't just apply to mPower. It will
14 spread, and given the concept's already in regulation,
15 I don't, I wonder if you see there's a policy issue
16 hiding here that goes beyond what's currently in the
17 regulation.

18 I don't quite get why this isn't a good
19 place to start putting it down on paper.

20 MR. MOSSMAN: I would say it's an area we
21 talked a little bit yesterday. I don't think the staff
22 is either ignorant or indifferent to this area. When
23 we talk about that control of access between the control
24 systems and the plant data network, that is something

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1 that covered under Part 73.

2 At our workshop we did bring the
3 cybersecurity folks in. We have engaged vendors on
4 this topic. Vendors have clearly understood what
5 we're talking to. Historically we have not addressed
6 control of access under Part 50 to control out to that
7 boundary lever.

8 CHAIRMAN BROWN: Well, the effective
9 boundary with these designs in the network has
10 established an interface that didn't exist in the old
11 analog designs. No matter how you slice it, it just
12 wasn't there.

13 And there was no ability for anybody to do
14 anything. Forget, non-maliciously there was no
15 ability for anybody to do anything, so you set aside
16 the cyber issue and we're just looking at what does the
17 architecture look like.

18 And now I want to communicate outside of
19 that to other people, and forget all the other stuff.
20 The rest of the world could be totally peaceful, benign
21 and nice. You still want that barrier there.

22 And, well I recognize reg at 5.71 talks
23 about those levels of defense. And I've forgotten,
24 what it's Level 2 to 3 or whatever it is.

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1 MR. MOSSMAN: Yes.

2 CHAIRMAN BROWN: Okay. It is still kind
3 of an optional, everybody's going to continue to
4 squeeze sausage as you get designs in and debate the
5 number of angels on the head of a pin as to what's
6 necessary or how good our firewalls are and all that
7 other kind of stuff.

8 So, and why we don't go ahead as part of
9 the architecture, it's there. It's being delivered.
10 There's no reason not to build in that communication
11 interface now as opposed to in some greater thing.

12 And all the rest of the world develops
13 around that. Remote access to these plants in any way,
14 shape or form is a death knell. It's a problem.
15 Forget the nature of the access.

16 In one of my old programs, we were trying
17 to make some software changes down on one of the ships,
18 and the vendor was saying oh geez, I can download. I
19 can send this software package via the Internet down
20 through the shipyard, down through something else.

21 And we can download it with a little clip
22 right across your chip, the new software version. But
23 consideration of that software process lasted
24 somewhere in the neighborhood of four or five

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1 microseconds.

2 It just didn't make any sense. Forget the
3 goodness or badness of it. There were just so many
4 opportunities, not maliciously, but non-maliciously to
5 happen before it got to the final state.

6 So you want, you don't want somebody to
7 have to be sitting around figuring it out. You don't
8 want to put that burden on the operators in the control
9 room and how they're controlling the access to get down
10 there.

11 I don't have any problem with laptops
12 being, everything else is controlled. You bring in
13 laptops. You change out chips. You bring a CD in on
14 the laptop and plug it into a cabinet. That's fine.

15 You can control that. Okay. Yes, is
16 there opportunity for malicious? Yes, there probably,
17 but that's off in the other realm. Here, you know how
18 to control that make sure you get the right versions
19 and everything.

20 But you don't want it to the point where
21 you don't have direct control inside the plant. And
22 you just ought to stop it. I'll stop there, and we
23 could go on with the brief.

24 MR. SANTOS: This is Don Santos. I just

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1 want to quickly mention and repeat some of Ian's words.
2 In the context of small modular reactors, they most
3 likely have to follow the new rule, when and if
4 available.

5 That's where we had that partial success
6 he talked about because we limiting and restricting
7 some of the communications that you are concerned
8 about. I mean --

9 (Crosstalk)

10 CHAIRMAN BROWN: It's still squishy in the
11 new rule.

12 MR. SANTOS: Because you're not allowed to
13 go back from non-safety to safety, for example, and if
14 you do you have to describe all the connections, all
15 the architectures.

16 CHAIRMAN BROWN: That's the point. If
17 you do, then you have to go through this stork dance
18 to say --

19 (Crosstalk)

20 MR. SANTOS: But it's better than what we
21 have today.

22 CHAIRMAN BROWN: Oh, I won't disagree with
23 that, but have we defined the network and outward as
24 a non-safety system? Not really. It hasn't even been

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1 addressed, so how that gets categorized is not known.
2 So I'm going to terminate my comments. Steve, go
3 ahead.

4 MEMBER SCHULTZ: Before we do that, Tim,
5 you leave this somewhat open here. Can you fill us in
6 on the list of other technical issues? How ripe are
7 they? Are they as ripe as this one as it is to the
8 committee? And Number 2, what's your schedule on the
9 SECY paper?

10 MR. JUNG: I will take that. As this
11 letter was carefully written, and the step, the
12 envisioning a SECY paper that we are thinking about 20
13 years down the road.

14 Some of the, for a new reactor, looking at
15 future reactor designs, and having had significant
16 challenges of digital implementation and full
17 international more or less and the state licensing as
18 well as safety.

19 The steps thinking about a potential
20 rulemaking for the future that really provides a
21 framework that is consistent with the 2008 commission
22 policy statement. I'm not sure you are aware of that.

23 In that policy statement, there's some
24 keywords. It talks about inherency of the design,

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1 simply design, easy to explain to the public and why
2 this is, easy to analyze and prove that it is safe.

3 And of course it talks about as good as the
4 current operating reactors and better. So lessons
5 learned and looking at the future, providing inherently
6 safe design for I&C.

7 I'm not sure if earlier designs to current
8 designs we've seen. I'm not sure we achieved that, so
9 given this opportunity, we are developing a potentially
10 new rule for the future with options.

11 And I'm not sure, I don't want to go too
12 far with that. Rulemaking's an option where you rate
13 requirements that really provide a new framework that
14 can really address the policy statement as well as the
15 experience.

16 So some of the things we are capturing in
17 the DSRS that might be reflected in those, well we are
18 looking at globally, we are looking at all the hazard,
19 some of the new ways of doing it, how to come up with
20 the regulatory requirements that can really
21 demonstrate safety as well as more efficient licensing
22 process.

23 I&C doesn't become a critical path in a lot
24 of the international instruction of the plants, so we

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1 are looking at broader of the issues. I'm not going
2 to solve their problems.

3 But if the commission allowed the
4 rulemaking, we'll identify all those issues and work
5 with all the stakeholders to come up with a new vision
6 and work on a new regulatory requirement and associated
7 guidance for the future.

8 So Mr. Schultz, it is not a one or off your
9 list. In terms of developing a SECY paper, we have an
10 intern plan we are looking at right now next about
11 seventh month or so. That's the current goal to
12 provide the commission with a SECY paper with an
13 options.

14 CHAIRMAN BROWN: Okay. I'm just trying
15 to, I haven't seen the list of technical issues you
16 intend to address. We haven't asked for that. But I
17 guess I really have a little bit of a problem with a
18 thought process where I say here are some architectural
19 configurations of an I&C issued design.

20 And we now have to develop those into a
21 policy. These are design related. They're not this
22 esoteric, high level policy range where should we
23 decontaminate land, or should we consider the economic
24 impact of contaminated land on how we build the plants

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1 and how far we go in terms of our safeguards.

2 Those are really high level items that
3 you've got to go consider and think about, and where
4 everybody's struggling with those types. But this is,
5 can I really operate this stuff and make it safe?

6 How do I prevent a new technology that
7 comes in, which is totally different, eliminates the
8 inherent protections that we had in the old analog stuff
9 on independence, determinancy and most of the other
10 fundamental principles?

11 How do we do that? Do we have to have a
12 policy on that? I have a problem with that, so I'm just
13 passing that on for information that they're
14 implementing and executing a design philosophy.

15 It's not a policy issue. It's a develop
16 the design issue and should be part of our reg guides
17 and our rules when we issue them. So I don't, we got
18 to go on, so Steve, did he answer your question?

19 MEMBER SCHULTZ: It didn't answer my
20 question, but I don't see it answering the question that
21 was, or the recommendation that was posed by the
22 committee, which was a specific design implementation
23 associated with this issue.

24 CHAIRMAN BROWN: That's right.

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1 MR. JUNG: In the new framework, the SECY
2 paper we are developing, we're going to be specifically
3 recommend, with a recommendation on that particular
4 topic of the controlled access being one of the, I don't
5 know how it's going to fit in.

6 But we are cognizant of your, the
7 committee's specific recommendation. So as we develop
8 SECY paper, we'll, under this set of recommendations
9 we're making with the options, we'll specifically point
10 out with that issue being one of the specific
11 recommendations. We are not objecting to your ideas.
12 It's a good recommendation.

13 CHAIRMAN BROWN: Do you have something
14 else?

15 MEMBER BLEY: Yes, I wanted to follow up
16 this discussion with something a little orthogonal, but
17 I appreciated Ian's soliloquy and pulling out that the
18 commission policy that emphasizes simplicity.

19 I just wanted to say, and this was here last
20 time. I don't remember if we talked about it much. I
21 really like the emphasis throughout this paper on
22 simplicity and having the appendix on it mostly because
23 we phrase this as fundamental principles and this other
24 thing simplicity.

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1 And my mind's been changing on that. I'm
2 really reaching, becoming convinced that simplicity
3 really needs to be the primary consideration and only
4 with that can we have confidence that we're meeting the
5 other principles.

6 I mean that really seems to be the key
7 thing, and when Charlie first joined us, he talked about
8 what they did in the Navy and their ability to control
9 their own chips. They could be very simple.

10 And the National Academy report from a
11 couple of years ago, Daniel Jackson of MIT I think was
12 the lead author on software and dependable systems. He
13 made a conclusion that's the only way you can get to
14 something that's convincingly dependable and reliable.

15 I like the emphasis. I hope we can keep
16 pushing that way in the future because everything else
17 we do is real hard to be convincing without that.

18 CHAIRMAN BROWN: The new systems are so
19 complex. The software, I mean when you look at the,
20 I don't know. Go back to the stuff we developed for
21 our program. And the first designs, we were talking
22 several thousand lines of code.

23 I mean we could go, it was on a few pages.
24 You could print it out. You could look at it. You

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1 could review it. As our systems got developed and
2 delivered more capability to the ships, and I can't
3 discuss those because I would be shot, treason and
4 everything else.

5 But the ships have capability today
6 directly because of these systems. They refined the
7 ability to do our safety analyses and operate in a far
8 wider range of conditions of the plant and at power
9 levels that were even unimaginable.

10 Okay. Pressure temperature ranges and
11 everything else that were unimaginable 30 years ago,
12 totally unimaginable. And it's because of the
13 microprocessor, computer-based systems.

14 But in doing that, and as the algorithms
15 got more complex, guess what happens? The code gets
16 more complex. There are more lines of code to review.
17 Now we had based this, we wrote our own operating
18 system, custom operating system.

19 We wrote our application code. Our
20 generic programming code for applications is literally
21 generic. There are blocks built in C+, C++, whatever
22 the current rage is, where if chips change, you can
23 reprogram.

24 And you can bring them in, and the blocks

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1 just fit in. You can design the stuff, and you review
2 it and you don't change those. But the code now is not
3 2000 or 3000 lines of code. It's 100,000 lines of code.

4 But it's still manageable. If you look at
5 the platforms, all of that underlying background stuff
6 that's going on in those platforms, Common Q platform,
7 for example. I bet you there's 1 million or more lines
8 of code, depending on how you want to count them.

9 And there's more stuff going on in the
10 background because that platform, they want to be able
11 to use it in a wide variety of applications. So you
12 are faced with the circumstance of how do you adapt and
13 utilize those commercially developed platforms
14 different from ours?

15 That requires now that the commission,
16 that you, the NRC develop a game plan. And that's the
17 focus of the four pillars and the items we've been
18 talking about to be able to put boundaries around those
19 platforms so that you can use them knowing you cannot
20 do a line by line review.

21 You cannot test the stuff to the level that
22 we do. We build entire systems. Every cabinet is
23 identical to what's in the ship. We have a giant
24 computer that models the plant. And then we run that

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1 code and have operators come.

2 They work and run all the procedures.
3 They've run the plants as if it's a plant. And then
4 we fix the stuff that doesn't work. Okay. You can't
5 do that, so you have to regulate in a manner.

6 Put boundaries around it and that's the
7 thrust of all the comments I've been trying to make,
8 okay, to make it so that you all have an easier time
9 of look and say look, we've got this in place, this is
10 place and this.

11 So this little widget part in here doesn't
12 work right. We are okay. So that's, while I may seem
13 intense, I probably am intense. Yes, I am. If the
14 object here is to take and apply these systems in the
15 realm in which you have to operate, not the realm in
16 which I used to have to operate.

17 It would be great if, do it the way we used
18 to do it. That's nuts, can't go there. So the thrust
19 for the last six years has been to try to build this
20 bow wave where the commission, staff really, okay, has
21 the ability to evaluate and use these things knowing
22 that you can't pick apart every one.

23 And you can't test it. Your vendors, all
24 those processes aren't going to pick apart what you

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1 need. You need to have an architecture that is going
2 to protect you from errors.

3 And I'll stop there, but that's the point
4 of what I've been trying to push. And that's why the
5 insistence on trying to put some of these boundary
6 conditions in, even though they seem to be inconsistent
7 with some other parts.

8 But yet the rule allows you to do this right
9 now. So, all right.

10 MR. MOSSMAN: I appreciate your comments,
11 and I also want to make sure you don't walk away going
12 back to the original Recommendation 3. There's no, I
13 don't think there's any disconnect between you and the
14 staff on what you want to accomplish.

15 It's just a function of how it's
16 accomplished and --

17 (Crosstalk)

18 CHAIRMAN BROWN: We'll keep working on it.

19 MR. MOSSMAN: If we're going to go forward
20 and do it this way, we want to make sure that the
21 regulatory top covers there to do it correctly.

22 CHAIRMAN BROWN: Okay.

23 MR. MOSSMAN: So.

24 CHAIRMAN BROWN: Thank you very much.

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1 We're now on Slide 10.

2 MR. MOSSMAN: All right, Recommendation
3 4, this particular comment to DSRS Chapter 7, Appendix
4 B, Instrumentation and Controls System Architecture.
5 In response to this comment, staff expanded the detail
6 in system architecture Item 1 to reflect that
7 sufficient information is necessary to demonstrate the
8 proposed architecture is robust.

9 The additional text emphasized the purpose
10 of providing this information which will facilitate
11 staff review of the fundamental design principles and
12 design attributes in Section 1 and Section 2, which was
13 kind of the point of the appendices.

14 Upon additional review and discussion
15 amongst the staff of the particular change, staff also
16 plans to make the changes noted on the next slide. And
17 so you can see on this slide, the words that are listed
18 in the old Item 3 are in black text. And the new
19 proposed content is in red.

20 CHAIRMAN BROWN: Okay. I have a comment.

21 MR. MOSSMAN: Okay.

22 CHAIRMAN BROWN: I read the change in Item
23 1. Those are just emphasizing the description of one
24 piece, well let me back off of that. Okay. Then you

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1 added these particular three items, and I went back and
2 looked at four again.

3 We did make some suggestions in our
4 comment, our original letter relative to what items
5 should be in the list, such as functional block diagrams
6 that show various things, which is, you've captured
7 from the D3 perspective.

8 But those are D3 perspective block
9 diagrams as opposed to what I call I&C architecture
10 block diagrams, which show the signal clear through.
11 And I think it's, the channel division assumptional
12 block diagram showing central keyhole device
13 actuation, intermediate processing and data for
14 producing a trip.

15 That's just a block. It's not all kinds
16 of details. It's just you have a block, a computer that
17 does the trip function. You have another block that
18 does the voting function or the voting functions are
19 subsumed within an algorithm in the one CPU, which
20 dictates a slightly different way.

21 How do you ensure that lock up is covered?
22 Okay. Those types of things aren't covered. That's
23 why we made the specific list in our recommendation.
24 I would encourage that you look at that first letter

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1 again.

2 I don't disagree with identifying the
3 systems, but I can identify the systems. That's a
4 list. That's not really something you can review and
5 say that I've, okay. They've covered.

6 They've got a number of systems in here.
7 That's the number of systems we think they ought to
8 have, but it doesn't tell you how I get from Point A
9 to actual control device actuation and what are the
10 connections.

11 It's easy, the same thing we got on AP1000
12 eventually as well as what we got on APWR as well as
13 what we got on EPR as well as I mean we got all those
14 eventually. It just was like sucking blood out of
15 rocks. That's all.

16 MR. JUNG: We understand.

17 CHAIRMAN BROWN: It's just a matter of you
18 getting the diagrams, and I'm not talking about
19 detailed wiring. You don't have that. You don't have
20 any of that right.

21 This has got to be the basic architecture
22 for how they process and how information gets moved from
23 one division to the other to accomplish the voting
24 function and to see that they're not sending other

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1 information over there such that they're sharing data
2 of some other sort because it would be nice if we did
3 this type thing. That's all.

4 MR. MOSSMAN: Yes, we're good.

5 CHAIRMAN BROWN: Where's C? I have no
6 idea what C and D is. I'm in appendix. Which appendix
7 is this anyway? Is this Appendix B? Yes, I can't
8 relate C and D. Oh okay. That's the same I've been
9 talking about. Okay.

10 Anyway, that's enough on that one. You
11 did do something. I just think you came up --

12 (Crosstalk)

13 MR. MOSSMAN: We hope to accomplish the
14 same thing, so.

15 CHAIRMAN BROWN: Just wasn't explicit
16 enough.

17 MR. MOSSMAN: Okay.

18 CHAIRMAN BROWN: I think the designers
19 ought to know that they can't design the system without
20 those architecture diagrams anyway, so you might as
21 well get them.

22 And those are the ones that are going to,
23 as I said before, that gives you more capability to
24 evaluate is this thing going to be within the boundaries

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1 that we can accept the people had to evaluate whether
2 every little logic diagram is exactly from Point A to
3 Point B. You're not going to have that. Okay?

4 MR. MOSSMAN: Yes.

5 CHAIRMAN BROWN: All right, Slide 12.

6 MR. MOSSMAN: Okay. Next we wanted to
7 address several comments that were made during the
8 previous ACRS Digital I&C Subcommittee meeting back in
9 November of 2012 on Chapter 7.

10 While these were not transmitted to the
11 staff as formal recommendations, the staff did
12 seriously consider the members' comments and questions
13 made during the meeting and modified the DSRS as
14 appropriate.

15 And just as importantly, Milton, Joe and
16 project managers and some of the other I&C staff kept
17 very good records regarding their review and resolution
18 of these items.

19 Otherwise it would've been really hard to
20 figure out what was done going back more than two weeks
21 ago. I should note that all these changes made in
22 consideration of these comments were incorporated
23 prior to the release of Chapter 7 for public comment.

24 So these were addressed before they went

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1 out. The first item --

2 CHAIRMAN BROWN: Did you grind through the
3 transcript?

4 MR. MOSSMAN: Yes.

5 (Laughter)

6 MR. MOSSMAN: And we had to do, our PMS
7 helped us do some special red line strike out stuff to
8 see what changed between this date and this date.

9 CHAIRMAN BROWN: Well, I notice from
10 Section 7.1 that you all, that, some of the changes.
11 It triggered my brain as to what we had talked about,
12 so I know that you all did incorporate it.

13 No way did I do a line by line check, so
14 I appreciate your diligence in doing that.

15 MR. MOSSMAN: Yes, and there were one or
16 two items here where I had to consult with Milton.

17 CHAIRMAN BROWN: Okay.

18 MR. MOSSMAN: First item, a comment was
19 made to augment the statements regarding the level of
20 information provided by an applicant to support the
21 staff's review. Staff made a number of additions to
22 the text in Section 7.0 to address this comment,
23 particularly in the level of review applied to I&C
24 Systems Subsection.

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1 Probably more importantly, however,
2 regulatory guide 1.206, combined license applications
3 for nuclear power plants, light-water reactor
4 addition, which contains guidance on development of
5 complete design certification applications, is
6 currently under consideration for revision.

7 The current version was released in 2007.
8 Any revision, which hopefully will be shortly, will
9 include lessons learned from the development of DSRS
10 Chapter 7.

11 CHAIRMAN BROWN: Good.

12 MR. MOSSMAN: Okay. A question was asked
13 as to who was responsible for reviewing instruments
14 covered by 10 CFR 50.34(f)(2)(xix), which had to do with
15 essentially monitoring of plant conditions following
16 design basis accident events.

17 Per Table 7.1, which is in the back of 7.0,
18 I&C has the review responsibilities for viewing such
19 instruments. However, it should be noted that, in fact
20 7.1 points to 7.2.13 of the DSRS, which contains the
21 statement under displays and monitoring.

22 "Experience shows that this review is best
23 accomplished by an interdisciplinary team consisting
24 of I&C, PRA, severe accidents, reactor systems and HFE

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1 representatives." So it's us, but we get help.

2 MEMBER STETKAR: A couple of things, and
3 there are some good things, and there's some bad things
4 about picking up something that you haven't read for
5 nearly a year and a half probably.

6 The good thing is you look at it with eyes
7 that are turned a bit differently than they were. And
8 that's a bad thing also. In particular, I have a couple
9 of comments on 7.2.13, and I know that the next slide,
10 it kind of covers the next couple of slides.

11 So let me just get them out first. In
12 particular, with the slide you have up here under the
13 staff response, that's good that you're going to use
14 an interdisciplinary team.

15 To me, it's rather interesting that you
16 don't list anyone with operations experience since
17 we're talking about instrumentation and displays that
18 will be used by operators.

19 I&C people, PRA people, severe accident
20 people and HFE people haven't ever probably operated
21 a nuclear power plant. So you might want to add
22 operations experience.

23 MR. MOSSMAN: Okay.

24 MEMBER STETKAR: Anytime we've included

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1 operators, we tend to learn things.

2 MR. MOSSMAN: Yes.

3 MS. STAREFOS: I think that's just a,
4 Joelle Starefos, I think that our HFE folks are also
5 our operator licensing folks in this case. So in our
6 mind that's, we're bringing that expertise to the
7 table. But we can certainly take back the note to
8 consider adding it as a --

9 (Crosstalk)

10 MEMBER STETKAR: If they've never
11 operated a nuclear power plant, they don't think the
12 same way.

13 MEMBER BLEY: Some of them have, but I
14 agree with John. It's important to have up here. PRA
15 do. Somebody in this group ought to --

16 (Crosstalk)

17 MEMBER STETKAR: It telegraphs the
18 sensitivities. Somebody might be able to wear two hats
19 simultaneously, but if someone's ticking off boxes,
20 it's worth it to have that box to tick off.

21 Now, a couple of other, this is from a new
22 read of that section, 7.2.13. There's an emphasis on
23 displays and monitoring. All of these are
24 characterized as part of TMI action items, which is

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1 good.

2 I mean we learned a lot from TMI. We're
3 also in the process of learning stuff from Fukushima.
4 I didn't see any references to that. We're now three
5 years into the process.

6 So, for example, I mean one thing that
7 caught me, my eye, is there's no mention of spent fuel
8 pool instrumentation, if I want to get real specific.
9 The other part, and I don't want to get real specific.

10 And that's part of the other trust of my
11 comments here is that it focuses on Type A, B, C, D,
12 E variables as a result of the TMI action plan. And
13 it cites things like Revision 3 and Revision 4 of Reg
14 Guide 1.97.

15 It makes statements to the effect that
16 well, the ranges for instrumentation in Reg Guide 1.97
17 Revision 3 remain acceptable going forward. Revision
18 3 of Reg Guide 1.97 is very, very, very, very, very,
19 very prescriptive.

20 And there's a note in Revision 4 of that
21 reg guide that says Revision 3 of Regulatory Guide 1.97
22 has become outdated. It also says the guidance should
23 be less prescriptive and based on the accident
24 management functions of the individual variable types.

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1 So if we're developing now a risk-informed
2 process, why don't we use the risk information and the
3 experience from the PRA, which includes severe accident
4 management issues to identify both the
5 instrumentation?

6 It should be available to the operator.
7 There may be a 1:1 correspondence if we're lucky, but
8 if there isn't, we ought not to focus things only on
9 what we understand from TMI.

10 And, not only the population of
11 instruments but also the ranges because in many cases
12 we may not have thought very clearly about severe
13 accident progression in particular in this particular
14 type of reactor and what sort of ranges an instrument
15 displays, might be appropriate for the operator.

16 There's no guarantee that something that
17 was crafted in whenever Revision 3 of Reg Guide 1.97
18 was issued, still remains our current state of
19 understanding.

20 So I recommend you kind of relook at the
21 specificity and sort of the TMI-centric notion,
22 recognizing that it's part of our regulations. So you
23 certainly can't ignore it, but you can rewrite things
24 to deemphasize the specificity and keep a broader

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1 context.

2 MR. MOSSMAN: That is good. I have a
3 question. Was there, I know at one point I remember
4 hearing the Fukushima stuff may have been moved to
5 another chapter. Was there another chapter that was
6 going to deal with that?

7 MS. STAREFOS: Yes, we are considering, in
8 fact I think we're doing it for the current large
9 light-water reactors that are going through review
10 right now to have a Chapter 20.

11 In addition, I recently was speaking with
12 PRA on something related to the instrumentation, and
13 they mentioned that the point that you just brought up
14 about instrumentation and beyond design basis.

15 We have actually added a couple of
16 subsections or parts to Chapter 19 that address like
17 loss of large areas in some of those. And I think that
18 sort of incorporates because we were talking about it
19 with reference to I&C and actually looking at those
20 documents.

21 And the new requirements and review
22 guidance that's out there, so we might need to just make
23 the links in these documents, but I think we are
24 thinking about this stuff.

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1 MEMBER STETKAR: That's the important
2 part because I&C is so pervasive.

3 MS. STAREFOS: Yes.

4 MEMBER STETKAR: And you don't want to get
5 into a situation where Chapter 19 folks are looking
6 within their own little bailiwick or if there is a
7 Chapter 20 and I would advocate not having a Chapter
8 20 in these because by the time these come in, Fukushima
9 will be old news.

10 I lost my train of thought, but because
11 things are so interrelated, if you're highlighting
12 things about an I&C person's review of the displays.
13 It already talks a lot about human factors engineering
14 and the layout.

15 I see people don't particularly care where
16 they're positioned on the boards. The human factors
17 people do, but they do look at the population of those
18 instruments because the I&C folks look at quality
19 requirements for them and environmental or at least
20 they have to make sure that those issues are addressed
21 in terms of that interdisciplinary approach.

22 MS. STAREFOS: And I hope you'll see,
23 later in the slide presentation, we took your comments
24 on interfaces between our organization to be very

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1 important. And we've made changes to that effect.

2 And we will continue to make changes, and
3 that I think goes back to this discussion on how are
4 we doing to do this review on a long-term. And the
5 office is considering what strategies and tools do we
6 need to do this.

7 So those are, it all kind of goes together
8 there, but we can take back the note to make sure that
9 we've addressed those interfaces specifically where
10 the chapter work is in another area like this large
11 light or this beyond design basis events issue. Thank
12 you.

13 MEMBER STETKAR: Thank you. Yes.

14 MR. MOSSMAN: All right, next slide.
15 This was a comment also on Table 7.1 regarding another
16 TMI action item and ensuring that Appendix A addressed
17 hazards from both protection and control functions.

18 Staff does agree that failure modes of both
19 protection and control functions must be evaluated.
20 And the hazard analysis scope in Appendix A does state,
21 "This review guidance supplies to any I&C system or
22 element of a system to which safety function's been
23 allocated or to which safety function depends or which
24 could impair a safety function" and then goes on to

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1 define impairment.

2 Providing the function when not needed,
3 wrong time, too long, interfering with another action,
4 which would include control systems in addition to
5 other safety systems.

6 Next slide. This was a comment on 7.1.1
7 Safety System Design Basis to expand on the acceptance
8 criteria for design basis, provide detail to what
9 adequate margin means.

10 We added, I could read the whole sentence
11 if you want me to. We added actually a couple sentences
12 to Item 4, which talks about the proper allowance for
13 instrument uncertainties between device setpoint and
14 process analytical limit.

15 It goes on to setpoint requirements in 6.8
16 of IEEE 603 and the setpoint guidance in 7.2.7 of the
17 DSRS. So we added a paragraph to make that linkage more
18 clear. Go to the next slide.

19 7.1.2 on Independence is a comment to make
20 sure a particular section address a lock-up, addressed
21 both reactor trip and engineer safety function feature.

22 And in response to Item 3 on communications
23 independence, we added the clause in front of all the
24 lock-up conditions you need to evaluate, the clause,

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1 "whether the processor controls a reactor trip or
2 engineered safeguards system function" to clarify
3 that's built.

4 Next one, 7.1.2 on Independence. This was
5 actually a number of comments on communication
6 independence. We made several changes. One was a
7 couple of sentences that implied that one way
8 communications in and above itself was sufficient to
9 demonstrate independence.

10 We eliminated that paragraph. Item 5
11 talked about, kind of called out reliability
12 improvements is not a justifiable means to add
13 communications. We deleted the note about
14 reliability.

15 And there was a comment on priority
16 modules. We beefed up that section on priority
17 modules. I am done.

18 (Off microphone comments)

19 CHAIRMAN BROWN: We're coming up to the
20 break here in two seconds. Do you want to speak --

21 MEMBER STETKAR: I can't speak. I'm not
22 a Texas cattleman auctioneer, so I can't talk quite that
23 fast.

24 CHAIRMAN BROWN: Okay. Go ahead. You

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1 are on which slide? You're still on Slide 17, and
2 you've had --

3 MEMBER STETKAR: Yes. There is still,
4 now I don't know how to, I have no idea how to resolve
5 this, but it's, there are statements that say command
6 initiating safety. I'm talking about priority, which
7 is why I hung up before we take a break here.

8 There are still statements that say that
9 a command initiating a safety function should have
10 highest priority and should override lower priority
11 commands, which would imply in some cases that
12 equipment protection signals will always be subsidiary
13 to safety signals.

14 And I think we discussed this whenever it
15 was, a year and a half ago. And is that really the
16 intent, because there have been several discussions,
17 even some of the, I don't remember whether it's here
18 or what we were discussing yesterday that there may be
19 some equipment protection signals?

20 For example, I don't necessarily want to
21 start a pump if I know that pump is going to burn up
22 because it has no cooling water. Perhaps I would like
23 to save the pump so that the operators can restore
24 cooling water to it.

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1 So it's not clear to me that from a
2 reviewer's perspective, if an equipment protection
3 signal is given equal to or let's say higher priority
4 than a safety signal but by definition that design is
5 unacceptable, somebody needs to review that in the
6 context of the safety analyses.

7 But in some cases, as a reviewer I'd be lead
8 to believe that carte blanche that's not acceptable.
9 You may to think about it because it's hard to write
10 guidance.

11 MR. MOSSMAN: Yes. It's a really good
12 comment, and I think one we'd really have to look at
13 kind of case-by-case because --

14 MEMBER STETKAR: It's just something, as
15 I said, I don't have a clear solution.

16 MR. MOSSMAN: From our perspective, you
17 also don't want to lose the big picture which is you
18 want to actuate the safety function.

19 MEMBER STETKAR: Absolutely. I just
20 wanted to make that comment and kind of alert you to
21 it because as I was reading through it again, I still
22 got a little bit of that impression that --

23 MR. JUNG: Obviously that area is a very
24 focus area for the staff, so I understand. But writing

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1 a guidance on all the different scenarios has been very
2 difficult.

3 MEMBER STETKAR: Well, you can't do it on
4 scenario-specific but providing, like I just said, I
5 don't know how to write it. If I knew how to write it,
6 I would've blurted it out on the record someplace, but
7 I'm listening. I don't know. Thank you.

8 CHAIRMAN BROWN: Yes, that was Item 9
9 under the communications independence.

10 MR. MOSSMAN: Yes.

11 CHAIRMAN BROWN: And I remember we did
12 have quite a considerable discussion on that in the last
13 meeting. And you made a minor, I noted a minor edit
14 in the thing, but it didn't relate to the discussion.

15 So the basic thrust was still the same, and
16 I think that's where John is --

17 MEMBER STETKAR: And that might be
18 appropriate, but it might be worthwhile to have
19 something to at least prompt the reviewers' attention
20 that in some cases it might not be completely black and
21 white.

22 MR. MOSSMAN: Okay.

23 CHAIRMAN BROWN: I guess the suggestion
24 he's extended how to resolve it. I would think you

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1 could make a statement like it should be, a commanding
2 should have the highest priority.

3 But some other statement that says if this
4 appears to be inconsistent relative to damaging, but
5 for other plant operational reasons, then it should --

6 (Crosstalk)

7 MEMBER STETKAR: The applicant should
8 provide adequate justification for any alternate
9 something or others.

10 CHAIRMAN BROWN: It's a little bit of what
11 we were talking about yesterday in terms of the
12 interface between some non-safety signals that come
13 into safety systems that might not provide a direct
14 safety benefit but might be really beneficial from an
15 operational standpoint, even information.

16 It's sort of analogous to that, that you
17 don't generally want to do that. But if the applicant
18 can show that there's a real benefit to it and no safety
19 detriment --

20 MR. ASHCROFT: I think we found that on one
21 of our reviews where there are some signals like you're
22 talking about that went straight over. And then they
23 wanted to bring some back.

24 And that's what we're talking about here,

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1 but a footnote or something or a highlight. Be on the
2 lookout for that.

3 MR. MOSSMAN: Okay. We've got some notes
4 in other sections and stuff like that.

5 CHAIRMAN BROWN: All right, let's go ahead
6 and take a break right now since we're heading into the
7 redundancy. We finished the independence part.
8 We'll break for 15 minutes. We'll come back here at
9 10:35. I'll give you 16 minutes. How about that?

10 (Whereupon, the foregoing matter went off
11 the record at 10:18 a.m. and went back on the record
12 at 10:40 a.m.)

13 CHAIRMAN BROWN: We're back in service.
14 The meeting is back in order, just to let everybody know
15 this time since I wasn't emphatic enough to end this
16 thing or recess it. We will reconvene now starting
17 with Slide 18, I presume, on redundancy, and we'll go
18 from there.

19 MR. MOSSMAN: All right, picking up where
20 we left out, going back to the previous Digital I&C
21 Subcommittee from 18 months ago, there was a comment
22 asking us to kind of revisit the use of Reg Guide 1.53
23 as the sole DSRS acceptance criteria for redundancy in
24 7.1.3.

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1 Staff did go back and review SRP 7.1(c)
2 Section 5.1 on the single failure criterion and
3 confirmed that that Reg Guide, what they used in the
4 SRP as acceptance criteria --

5 CHAIRMAN BROWN: So you feel it's
6 satisfactory?

7 MR. MOSSMAN: Yes, we felt we were
8 consistent with the SRP. Slide 19, we had a comment
9 considering adding review guidance to address
10 different modes of operation that could challenge
11 redundancy.

12 And this was under review procedures,
13 specifically under Item 4. We augmented that to call
14 out specific sections of IEEE 603-1991 that the
15 reviewer should consider, which include clauses on
16 testing calibration and maintenance.

17 So we augmented that. 7.1.4 is on
18 predictability and repeatability. Received a couple
19 of comments on the section to which we made several
20 different changes.

21 One was revisiting the use of IEEE 603-1991
22 Section 4.10, and we did in fact add acceptance criteria
23 1B, which added 4.10. Section 4.10 indicates the
24 applicant should identify critical points in time after

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1 the onset of a DBE.

2 It should be specified in the design basis.
3 We also added text to Item 2 of the review procedures
4 to point to Section 4.10 of IEEE 603. In addition, we'd
5 reflect a completion of protective actions, 7.2.3.

6 The section on reliability, integrity and
7 completion of protective actions does have a section
8 on completion of protective actions. Slide 21, this
9 is the first of several comments on 7.1.5, diversity
10 of defense-in-depth.

11 There was a question on whether or not all
12 the content of BTP 7-19 was pulled over. The staff did
13 do another walk through BTP 7-19 and confirmed that the
14 content was accurately and completely pulled over.

15 There's some of the extra bulk, and BTP
16 7-19 was attributed to boilerplate discussion material
17 that wasn't explicit staff guidance.

18 CHAIRMAN BROWN: But you felt the
19 technical parts of that were consistent, but the
20 generality type parts weren't really adding any value.
21 And you just kept those out?

22 MR. MOSSMAN: Correct.

23 MR. JUNG: Some of the generally and some
24 of the repeated items as well as others.

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1 MR. MOSSMAN: The next comment was on
2 credible spurious actuation.

3 CHAIRMAN BROWN: Let me ask one question
4 on that. And this is really, I noticed in a couple of
5 the different sections that there used to be words there
6 if the designer or somebody wanted to propose
7 alternative blah blah blah blah.

8 And there was two or three sentences
9 relative to that. Then they would have to provide the
10 detail. That was deleted from a number of these
11 places.

12 And I don't have any problem with that
13 because it seemed to me there was a more general
14 statement somewhere. And I was trying to recall where
15 the general statement was.

16 MR. ASHCROFT: I believe we put that
17 general statement 7.0 to cover all.

18 CHAIRMAN BROWN: I re-read that, and I
19 missed it.

20 MR. ASHCROFT: Well, I said I think.

21 CHAIRMAN BROWN: Yes, it ought to be in one
22 place. There's no reason to repeat it everywhere, but
23 is it really there. Can you tell me where it is?

24 MR. ASHCROFT: We confirmed that. I

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1 maybe will pick that up as an action item.

2 MR. MOSSMAN: Yes, we'll double check on
3 that.

4 MR. ASHCROFT: Yes, we agreed that it
5 should be in there and be in one place.

6 (Off microphone discussion)

7 CHAIRMAN BROWN: All right, so you'll look
8 to see if it's, I was going to go keyword alternate and
9 see where it showed up. And I haven't done that since
10 I was listening. I can't multitask that easily on the
11 computer. Joe, you're going to be looking for that?
12 Okay. All right, where are we? We're back.

13 MR. MOSSMAN: If it's not there, we'll get
14 it there.

15 CHAIRMAN BROWN: Well, Christina pointed
16 out, let me see. Where was that Christina? It looks
17 like it's in 7.1, at least a little bit. Oh, that's
18 a different issue. What did you say, Dennis? It's in
19 7.1?

20 MEMBER BLEY: There's some of it in 7.1.

21 CHAIRMAN BROWN: Yes, they deleted it in
22 some places, and I was just trying to, we ought to
23 consistently do it. It ought to either be in one place,
24 or it ought to be consistent with what you're doing.

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1 And I'm not going to sit here and tell you which.

2 MR. JUNG: We'll follow that up.

3 CHAIRMAN BROWN: Okay.

4 MR. JUNG: There is already a specific
5 regulation that already talks about applicant's review
6 SRP, any alternative to the step guidance to the SRP
7 needs to be justified. So we could be potentially, I'm
8 not sure, in Section 1 of the SRP where we are advising
9 of that discussion.

10 MR. MOSSMAN: Yes, I think I found where
11 it might be under 7.0.

12 CHAIRMAN BROWN: Did Joe find it or no?

13 MR. ASHCROFT: We did.

14 CHAIRMAN BROWN: While we're thinking
15 7.0, there's one thing that I forgot to bring up when
16 we were talking. Just make a note of this.

17 MR. MOSSMAN: Sure.

18 CHAIRMAN BROWN: And this was on Page 3.
19 The first item, it says DSRS Chapter 7 covers the
20 following topics, and it goes through architecture
21 descriptions, et cetera, namely independence,
22 redundancy, predictability and D3.

23 The previous version said "and
24 simplicity." That was deleted --

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1 MR. MOSSMAN: Yes.

2 CHAIRMAN BROWN: -- from the overview.

3 MR. MOSSMAN: Because it talks to, I
4 believe that particular paragraph talks to 7.1, and
5 simplicity is in the appendix, not in 7.1.

6 CHAIRMAN BROWN: Oh okay. Got it.
7 Understand, that's fine. Okay. Back to, I'm sorry to
8 --

9 (Crosstalk)

10 MR. MOSSMAN: All right, 22, another
11 comment on the D3 section. This was a question about
12 credible spurious actuation, software common cause
13 failures and the term "credible" was defined.

14 Guidance on spurious actuations is covered
15 under 7.1.5 under the additional considerations for D3
16 review item B. The term "credible" was removed from
17 that section. We actually took it out because we could
18 not find, the term credible is not defined in
19 NUREG/CR-6303.

20 MEMBER STETKAR: Or defined anywhere.

21 MR. MOSSMAN: Yes.

22 MEMBER STETKAR: And indeed you got it out
23 of there. Thanks. You did not get the concept of
24 credible out of the entire document. In a couple of

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1 places you did add some things to explain what you meant
2 by credible.

3 So I don't want to do a word search here,
4 and it's kind of pointless. But I noted in a couple
5 places you gave an example of what you meant by that.
6 In a lot of places you didn't.

7 So I just suggest that you go back through
8 the entire, do a word search on credible and look at
9 the context every time it's used. And if you can't
10 remove it, at least try to explain your intent because
11 you did that in at least one place here. So I said okay
12 --

13 MEMBER STETKAR: I might argue what's
14 credible, but at least you've identified --

15 CHAIRMAN BROWN: Your thinking. In many
16 other, well I don't want to say many other, a number
17 of other places it's still, you have to consider a
18 credible failure.

19 MR. MOSSMAN: In addition, we also, one of
20 the other areas we're interested in with respect to this
21 topic is common cause failures of non-safety systems
22 and spurious actuations.

23 And one of our staff, Wendell Morton, is
24 currently working on augmenting our guidance in that

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1 area. That's an area, it's a lesson learned from some
2 of our other design certification reviews. And we
3 expect to be augmenting staff into a regulatory
4 guidance with this.

5 MEMBER STETKAR: There's just so much
6 effort that's spent. I've been involved in discussion
7 where people are arguing over, somebody says well, we
8 didn't consider it because we don't think it's
9 credible.

10 And you say I don't need to consider
11 something if it's not credible, so now you're arguing
12 over what you think is credible and what I think is
13 credible without anybody having any metric for what
14 we're arguing about. So why are we arguing?

15 MR. MOSSMAN: And I --

16 MEMBER STETKAR: And there are ways of
17 getting the concept across without using that
18 ill-defined word.

19 MR. MOSSMAN: Yes, and I think from past
20 experience, years ago I used to be a risk manager at
21 both NASA and DoD projects. And I found there's a
22 psychological barrier to getting folks to own up to
23 concerns they have.

24 And folks would rather either explain that

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1 I don't have to consider this because it's not going
2 to happen because I already did this and this. And they
3 give you the answer without telling you what the
4 question was they were addressing.

5 And from a risk manager standpoint, I
6 wanted to try to drive out the question because it was
7 important to know what the true risk was to know what
8 they were trying to put into the program, whether it
9 be budgetary item, a schedule control, because if
10 management later came on and de-funded your contract
11 or something, that risk became real again.

12 And the same issue here is if you don't
13 understand what the spurious actuation event is, you
14 lose design basis information. So --

15 MEMBER STETKAR: Anyway, just take it as
16 a comment. Do a word search and --

17 MR. MOSSMAN: Slide 23. There were
18 multiple comments on the use of D3 on the use of manual
19 action as a diverse means. The first comment was to
20 remove the offending term "would be."

21 And we changed that to "could be" actually.
22 The second one was to define "sufficiently diverse."

23 CHAIRMAN BROWN: Okay. Hold it.

24 MR. MOSSMAN: Okay. Yes.

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1 CHAIRMAN BROWN: I'm looking at Item B,
2 "change would be to should be," under review
3 procedures. I'm not sure I'm in the right part of
4 review procedures.

5 MR. MOSSMAN: It's under use of manual
6 action as a diverse means.

7 CHAIRMAN BROWN: Okay. Now I can find the
8 should be and why it's still would be.

9 MR. MOSSMAN: And we actually changed it
10 apparently to "could be."

11 (Laughter)

12 CHAIRMAN BROWN: Yes, I was noticing it
13 was "could be." I was just going to question. You see
14 that first line now says "could be."

15 MR. MOSSMAN: I do want to point out we
16 didn't change it to "must" though.

17 (Laughter)

18 CHAIRMAN BROWN: Now there's another
19 "would be" later that instead of being a "should be,"
20 but presumably that "would" is okay. We've argued this
21 should versus would in multiple places before.

22 MR. MOSSMAN: Okay.

23 CHAIRMAN BROWN: And that's in the third
24 line down.

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1 MR. MOSSMAN: Yes, I'll check on that one.
2 The second item was on the term "sufficiently diverse."
3 And we could not find "sufficiently diverse" defined
4 elsewhere.

5 We do provide guidance on assessing
6 diversity and determining sufficiency is at this point
7 we consider subject to engineering judgment.

8 CHAIRMAN BROWN: So you didn't do anything
9 with that?

10 MR. MOSSMAN: Yes, we didn't come up with
11 a new definition. And the last one was to revisit the
12 sentence on revisit what was Item D and now Item 4, which
13 was about the human, essentially human actions.

14 And we did add some minor text to that
15 section, but also do want to point out in the main text
16 under use of manual action, it does say "acceptability
17 would be in accordance with Chapter 18, which provides
18 review criteria for crediting manual operator actions
19 in D3 analysis."

20 That's an area we try to, in I&C space we
21 try not to wander off the reservation and go talk to
22 the people that actually know how to do that. Slide
23 24, this was requesting incorporation of NUREG/CR-7007
24 in the D3 section.

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1 Currently, the D3 section does talk to
2 NUREG/CR-6303, which was developed as specific
3 guidance to be used in staff reviews. NUREG/CR-7007
4 provides a number of insights in the diversity from
5 studies of other industry.

6 However, it was not endorsed as part of the
7 effort to revamp BTP 7-19 and within a context, even
8 that was just recently done, the staff did not feel
9 comfortable providing its initial endorsement here.

10 CHAIRMAN BROWN: That wasn't me, so if
11 somebody's got some other comment on that, they're
12 going to have to --

13 MEMBER BLEY: What was 7007?

14 CHAIRMAN BROWN: That's what I'm trying --
15 (Crosstalk)

16 MEMBER STETKAR: Diversity strategies for
17 nuclear power plant instrumentation and control
18 systems, published December 2008.

19 MR. JUNG: You remember Mike Waterman's
20 The Wheel.

21 CHAIRMAN BROWN: That's what I thought it
22 was. Okay, the Waterman Wheel.

23 MR. JUNG: That's a keyword, Waterman
24 Wheel.

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1 CHAIRMAN BROWN: Mike? Is he here? He's
2 not here.

3 (Laughter)

4 MEMBER BLEY: But you don't endorse it?

5 (Crosstalk)

6 MR. MOSSMAN: If somebody chooses to use
7 it, staff would consider their use of it and evaluate
8 it on a case-by-case basis, but we don't provide a
9 formal endorsement as that's an automatic way to meet
10 the regulation.

11 Slide 25, this one was pretty easy. There
12 was a particular paragraph, there was comment to move
13 a particular paragraph to the beginning of the section
14 to emphasize its content. And we, in fact, moved that
15 paragraph to the front of the section.

16 Slide 26, we're still in the D3 section.
17 Under additional considerations for D3 review there was
18 a comment on Item 4.B, which was on testability. We
19 went back and looked, and that particular statement was
20 an extract from BTP 7-19.

21 So we didn't change the wording on that as
22 that came out of --

23 CHAIRMAN BROWN: 4.B?

24 MR. MOSSMAN: Yes, it should be currently

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1 4.B.

2 CHAIRMAN BROWN: Under additional
3 considerations?

4 MR. MOSSMAN: Yes.

5 CHAIRMAN BROWN: I'm not connecting the
6 dots.

7 MR. MOSSMAN: I think it had to do with 100
8 percent testability.

9 CHAIRMAN BROWN: I remember reading
10 something about 100 percent, about the 100 percent
11 stuff, but there's no Item 4 under additional
12 considerations for D3 review.

13 Was it old Section 4.B? There's a section
14 now. It's called Section 5, additional considerations
15 of D3 review. And there is a B under that. And my
16 notes say that everything under that is approximately
17 the same. So that's the flavor is that you didn't
18 change anything?

19 MR. MOSSMAN: Yes, because it came out of
20 BTP 7-19.

21 MEMBER BLEY: It's in that section, but
22 D.2 on Page 67, too, is about testability. Could that
23 be it?

24 CHAIRMAN BROWN: That's the 100 percent

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1 testing case?

2 MR. MOSSMAN: Yes, it is. It's in D.2.

3 CHAIRMAN BROWN: It's now D.2.

4 MR. MOSSMAN: It's now B.2.

5 CHAIRMAN BROWN: Under five, 5B.2

6 MR. MOSSMAN: Yes, on Page 67. Yes.

7 CHAIRMAN BROWN: You changed the last
8 sentence. No, you, well the last sentence on that one
9 page. It was the one that said fully tested or 100
10 percent testing, means that every possible, that was
11 not in there in the last version.

12 MR. MOSSMAN: Okay.

13 CHAIRMAN BROWN: At least I don't think it
14 was.

15 MR. MOSSMAN: We have to double check on
16 that.

17 MEMBER STETKAR: No, I'm double checking
18 even as we speak. The previous version just said if
19 a system is sufficiently, it's got the first sentence
20 in what is now D.ii and you added the last two sentences.

21 CHAIRMAN BROWN: Well, the next page has
22 more sentences.

23 MEMBER STETKAR: I'm sorry. That's
24 correct. That's why you're the boss, and I'm not.

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1 MR. MOSSMAN: Yes, you're correct. The
2 last sentence was added.

3 CHAIRMAN BROWN: On Page 67?

4 MR. MOSSMAN: Yes.

5 MEMBER STETKAR: And the continuation of
6 that same subparagraph --

7 (Crosstalk)

8 CHAIRMAN BROWN: The point being is you
9 did make a change.

10 MEMBER STETKAR: It sort of explains what
11 100 percent is.

12 CHAIRMAN BROWN: Yes, I don't disagree
13 with it. It's just fine.

14 MEMBER STETKAR: That's physically what
15 they did.

16 MR. MOSSMAN: Okay. We didn't get rid of
17 it though.

18 CHAIRMAN BROWN: You added the sentence,
19 and you didn't change it. I didn't notice any other
20 major changes --

21 MR. MOSSMAN: On that one. There was also
22 a comment on 1.B and 1.C which are now 5.A.ii and 5.A.iii
23 to provide additional words on command prioritization.
24 And I could read the text, but we added a bunch of words

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1 to 5.A.ii and 5.A.iii.

2 CHAIRMAN BROWN: Oh, A.iii. It's on Page
3 65.

4 MR. MOSSMAN: 65.

5 CHAIRMAN BROWN: And you added an example
6 in 5.A.iii.

7 MEMBER STETKAR: And this again is the
8 comment that I made, this is another example of a
9 commend initiating safety systems should have highest
10 priority and should override lower priority commands.
11 If that kind of thing appears in, it's a couple of
12 places.

13 CHAIRMAN BROWN: Yes, but they did provide
14 a couple of, for example and then however, in the case
15 of A, whatever. There's some explanation. There is
16 some elaboration, which is good. Okay.

17 MR. MOSSMAN: All right.

18 CHAIRMAN BROWN: I don't have any other
19 comments on that unless you guys do.

20 MR. MOSSMAN: Okay. Slide 27 was on
21 simplicity, and we had a comment to revisit statements
22 in Item 3, this is Appendix C, revisit statements in
23 3.D.iii and 4.D.

24 In particular, there was a phraseology in

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1 there that implied that we could have unnecessary
2 connections as long as you were out of service, so we
3 deleted the "unless your system is out of service."

4 The intent was good. The wording was odd
5 and asked for an example under Item 7.C and 7.D. 7.D
6 no longer exists, but under 7.B we did add an example
7 on a number of security protective features as well as
8 safety systems.

9 And then Slide 28, there was a comment on
10 staff involvement with EQ tests and involvement of the
11 I&C staff. In particular we went back to Section 7.0,
12 I&C review system interfaces, and we added text to Items
13 6 and 7 to address environmental qualification reviews.

14 And then on 29, there was kind of an
15 overarching comment on clarifying I&C review roles and
16 responsibilities in a variety of different areas. I&C
17 staff does appreciate the importance of interfacing
18 with other review staff as I&C systems often interface
19 with a lot of other aspects of the review.

20 I&C staff has embarked on work to further
21 explore interfaces with other DSRS sections, and
22 several meetings have taken place to begin establishing
23 review interfaces.

24 For example, staff from I&C, which was lead

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1 by Paul Pieringer, in staff and containment and in 2013
2 to discuss interfaces between Chapter 6, which is
3 containment and ventilation and Chapter 7.

4 I believe in addition, Paul started
5 interface work with Chapter 8, electrical. And later
6 in this presentation, which might be one or two slides
7 from now, we'll talk a lot about the interfaces.

8 We've been working with the vendor quality
9 branch with respect to I&C quality. Another
10 office-wide initiative is underway to reexamine the
11 primary and secondary review branches for each SRP
12 section.

13 And this is an area where I think we're
14 going to gain a lot by piloting the guidance and
15 learning how these interfaces work and rolling us back
16 into the guidance.

17 All right, Slide 30, last major section of
18 the presentation today. The one major section of the
19 DSRS that was not available for review in November,
20 December 2012 was Section 7.2.1 on quality.

21 It was still under development at the time.
22 However, this section was completed and included in the
23 DSRS version that was released for public comment. So
24 our public comments did reflect public review of that

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1 section.

2 CHAIRMAN BROWN: So the public did see
3 this?

4 MR. MOSSMAN: The public did see this.

5 CHAIRMAN BROWN: Okay.

6 MR. MOSSMAN: This new section on I&C
7 quality incorporates the review guidance that was
8 contained in the SRP, including the material from BTP
9 7-14.

10 CHAIRMAN BROWN: This is the existing SRP
11 you're talking about?

12 MR. MOSSMAN: The existing SRP.

13 CHAIRMAN BROWN: So you just kind of
14 lifted and transposed?

15 MR. MOSSMAN: Yes, and tried to, yes tried
16 to make it a little more streamlined in the way we lay
17 it out in the SRP, kind of eliminate some of the
18 redundancy. One of the driving goals behind
19 developing this section was achieving greater
20 coordination with the NRC's vendor quality review
21 staff.

22 The regulatory bases for I&C quality are
23 the same as the regulatory bases for quality of other
24 safety-related components in nuclear power plants,

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1 specifically 10 CFR 50 Appendix A, GDC 1, 10 CFR 50,
2 Appendix B and 10 CFR 50/55-A-A1.

3 Staff has high confidence in its use of 10
4 CFR Appendix B to ensure development of high quality,
5 safety-related systems. At this time, staff does not
6 recognize any other third party assessments of quality
7 as a substitute for an Appendix B program.

8 Staff's expectations are that we can
9 achieve a review that is more efficient by leveraging
10 existing staff expertise and quality, while ensuring
11 the technical staff are able to focus on aspects of
12 quality that may be unique to I&C systems. Next slide.

13 CHAIRMAN BROWN: Before you do, general
14 question in looking at this and based on what you said.
15 I might be restating what I've already said, but the
16 general point that I'm taking from your comments is that
17 we didn't, other than eliminating some redundant type
18 things, we didn't add, you, not we, but you all did not
19 add anything new relative to, you don't say that in the
20 slides.

21 You didn't add anything new that's not in
22 the existing general quality approach to doing things
23 based on the SMR design relative to an LWR. Is that
24 --

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1 MR. MOSSMAN: I think the only new, the
2 little bit of new verbiage was added on allowing
3 applicants to discuss other quality measures they may
4 have in place. But they are not formally credited as
5 a substitute for Appendix B.

6 CHAIRMAN BROWN: Okay. But that's kind
7 of a standard thing.

8 MEMBER STETKAR: There's a bit of
9 discussion of graded quality for like the B-1 stuff.

10 MR. MOSSMAN: Yes. And in fact in 17, SRP
11 17.5, if the quality people are out there, they can
12 correct me on the fly. I believe it's 2.v. There's
13 a section that --

14 (Crosstalk)

15 MR. MOSSMAN: -- specifically talks to
16 non-safety related.

17 (Crosstalk)

18 MR. JUNG: If you don't mind --

19 CHAIRMAN BROWN: No, go ahead.

20 MR. JUNG: Remember when this particular
21 topic, although this section wasn't completed and some
22 of the staff members came. Originally we talked about
23 improving areas for, in terms of more process program
24 driven rather than architectural design issues.

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1 This particular area of software quality
2 has been quite challenging in previous reviews, so
3 there are some lessons learned. Earlier topic there
4 was a concept of hey, can we utilize in some way the
5 user by third party assessment.

6 If you remember, there was a discussion on
7 the CMMI as one of those tools. And the safety,
8 integrity level in some other industry used that as a
9 third party certified that and regulatory agency would,
10 instead of the staff members, would go down and do a
11 detailed evaluation.

12 There's a third party who's been, in some
13 cases they're better prepared to audit and inspect in
14 most of the cases. So we pursued that. We see the
15 benefit of that for confidence building from a staff's
16 perspective.

17 But at the end, we came to a realization
18 that approach by itself cannot be a reduction of NRC's,
19 relaxation of the requirements by itself. So there we
20 had a lot of discussion.

21 But the decision we made was although we
22 continue to sort of have a discussion with an applicant,
23 doing that is a good practice. It's been shown to be,
24 yet I think our guidance to be decided to focus on

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1 improving the current structure we have. And that's
2 why the vendor and the --

3 (Crosstalk)

4 MR. PRESCOTT: Yes, from a quality and
5 vendor perspective, we still believe that it's in the
6 best interest of the staff to perform the review because
7 we are responsible for the safety evaluation.

8 The staff has qualified inspectors. The
9 staff has done multiple QA inspections. We're
10 familiar with how to review the implementation of the
11 process, and we can essentially assure the I&C staff
12 in a much more thorough way that the processes that are
13 being implemented by the vendor are working for that,
14 or they're not working for them.

15 And we hold them accountable to a
16 regulatory standard, inspections. We issue notices of
17 non-performance to the vendor. They have to correct
18 their program and notify us of their corrective actions
19 so we can verify the implementation of those corrective
20 actions.

21 So we really think this is a much better,
22 more streamlined approach because when at the quality
23 vendor staff, I'm familiar with the quality assurance
24 requirements and know how to impose those from a

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1 regulatory perspective.

2 CHAIRMAN BROWN: I fundamentally don't
3 disagree with that. I mean if I were you all, I
4 would've thought I would've had to do a very, very
5 thorough evaluation and audit of the third party.

6 They can't just have their own little world
7 of certifications. You'd have to go and spend a large
8 amount of time ensuring that their accreditation and
9 their qualification to do that as "experts" really met
10 you all's requirements.

11 And then you would have to have a periodic
12 reassessment. And that's not every five years. It
13 would have to be much more frequent.

14 MR. PRESCOTT: As a matter of fact, that's
15 the case. With ASME, we don't take credit for ASME
16 performing audits. The information on 8621, the onus
17 is still upon us to verify implementation of a vendor's
18 program. So you're right, it has a lot of backdrops
19 to it.

20 CHAIRMAN BROWN: Well, relative to that
21 comment then, and I'm trying to remember where it was
22 in here when I was pulling back through this thing.
23 There was a whole section relative that talked, at one
24 time, commercial dedication of computer platforms of

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1 some kind.

2 It referenced 7-4.3.2, some type of
3 commercial dedication process. And we had discussed
4 that in the last meeting. You don't remember seeing
5 that again?

6 MEMBER STETKAR: I think they took out the
7 commercial dedication stuff, I remember. I don't
8 remember seeing that.

9 CHAIRMAN BROWN: I was looking in the old
10 one, and I couldn't, I was looking to try to find a
11 similar reference. Either I'm forgetting, I was doing
12 this the last two nights up until about midnight.

13 And quite frankly, if you think my brain
14 retained all the pieces I was looking at come around
15 11:00, it was not happening, okay.

16 MS. STAREFOS: This is Joelle. Yes, I
17 believe you're correct. I just did a quick search, and
18 we have removed it from this current version. And I
19 think it backdrops against what Paul was just talking
20 about.

21 Across the agency we have not felt
22 comfortable taking advantage of third party quality
23 programs, and so we've fallen back in line with exactly
24 where the agency was even though we had considered this

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1 as a potential initiative an opportunity. I think that
2 we realized that wasn't the best way to go. Is that
3 --

4 MR. JUNG: Yes, the underlying regulation
5 of the commercial dedication is Part 21.

6 CHAIRMAN BROWN: Is what?

7 MR. JUNG: 10 CFR Part 21.

8 CHAIRMAN BROWN: 21.

9 MR. JUNG: It's not, from either
10 commercially dedicated or nuclear grade. There's a
11 part of the regulation for meeting the quality and
12 acceptability for safety. It should be equivalent.
13 Let's put it that way.

14 So it's laying out in Chapter 7 guidance
15 on how to do commercial dedication appears to be out
16 of line. There's plenty of other industry guidance.
17 And how to do that is out there.

18 There are processes, and there's continued
19 engagement on how the industries working on this.
20 There's actually a public meeting today to talk about
21 that this morning.

22 CHAIRMAN BROWN: They still want to do it.

23 MR. JUNG: Yes, but from our perspective
24 we didn't feel the need to specify how to do commercial

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1 dedication within this framework. We focused on what
2 is the safety requirements, how to meet that design
3 requirement.

4 And in terms of the quality, and if you want
5 to focus on how staff would review that knowing that
6 there's a set of programs available already under the
7 Appendix B programs and of that nature.

8 I think that's why Paul and we are all
9 working together so that there's no gap or any
10 inconsistencies.

11 CHAIRMAN BROWN: Okay. I want you to help
12 me with one other thing because I want you to
13 recalibrate me because I've kind of lost the bubble.
14 On the qualification of the platform, like the Common
15 Q, the Triconex, the, I don't know, whatever one of the
16 other ones is, haven't you all actually reviewed?

17 You did the qualification of that
18 yourselves did you, at some point?

19 MR. MOSSMAN: Technically, we do not do,
20 and Paul correct me if I'm wrong, we do not do the
21 commercial grade dedication. The commercial grade
22 dedication needs to be done by an Appendix B entity.

23 MR. PRESCOTT: Under Part 21, I'm sorry.
24 Paul Prescott, under Part 21, yes it's the vendor or

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1 the licensee's responsibility. It requires having an
2 Appendix B program to implement it. We do not do that.
3 We do not do the commercial grade dedications.

4 CHAIRMAN BROWN: No, I know you don't do
5 it yourself.

6 MR. MOSSMAN: We have reviewed
7 applications that have come in with commercial grade
8 dedication. And we've reviewed the --

9 MR. PRESCOTT: We have staff that are
10 familiar with commercial grade dedication. I, myself,
11 am working with EPRI right now to develop a design
12 analysis software commercial grade dedication
13 guidance. So the staff is very familiar with the
14 implementation of commercial grade dedication.

15 CHAIRMAN BROWN: Okay. I'm trying to
16 reconcile the fact that you say you decided to not go
17 down the path of any commercial grade third party
18 certification or qualification.

19 But yet for the platforms the vendors want
20 to use or a vendor is proposing to use, I recall seeing
21 where words were used that the NRC actually wrote a
22 letter for the Common Q platform that it was in some
23 characteristic, it was approved by the staff.

24 MR. JUNG: I understand, Charlie.

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1 CHAIRMAN BROWN: I'm trying to reconcile
2 no commercial certification, but that seems to be
3 dis-consonant with the --

4 MS. STAREFOS: This is Joelle. I think
5 one of the things that, just to kind of separate this
6 is we don't preclude them from using commercial grade
7 dedication. We didn't choose to identify a unique
8 process or separate guidance in this particular
9 document for I&C Chapter 7 DSRS. I think that --

10 MR. JUNG: Charlie, also what you're
11 referring to is the agency's topical report to review
12 process. With an intent of allowing the staff review
13 to be more efficient and effective, some of the more
14 challenging areas, topical reports are provided to the
15 staff so the staff writes an evaluation on that with
16 a set of conditions.

17 If anybody chooses to use that particular
18 platform, for example, they have to evaluate
19 applicability of the platform for specific
20 applications like COL applicants or design
21 certification or license amendment.

22 They will have to address all of the
23 conditions associated with that topical report. And
24 in doing so, one of the key areas that the staff is

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1 looking at is a qualification, environmental
2 qualification being one of the key areas.

3 Many of the, but that doesn't mean it meets
4 the 603 because 603, Part 50 regulations are on a very
5 specific application of the design for architectural
6 design, a platform specifically designed for certain
7 capabilities or functionality and the capability to
8 result in environmental --

9 (Crosstalk)

10 CHAIRMAN BROWN: Yes, but when you review
11 that topical report, and you have written a letter back
12 to that whoever it is that sent it to you and there are
13 a list of things that comprise the device, the platform
14 when you did that review, you then, if somebody wants
15 to use that, they can't use a next generation.

16 They have to use a generation that complies
17 with the topical report and the conditions you may have
18 set in your letter. I'm just trying to get a grip.
19 Does NRC have their hands on the platform as thoroughly
20 as I used to think you did?

21 But then I've started worrying when I read
22 some of this that maybe we were losing the bubble. Then
23 I heard another comment from your quality guys, and then
24 all of a sudden I'm back to, well there's a little bit

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1 of difference when I'm talking.

2 MR. JUNG: In terms of the other versions,
3 that has become a challenge in some cases where certain
4 platforms that the staff approved versus what's being
5 applied has such a significant change that, in such a
6 way that the later revisions the staff had to get
7 engaged to make sure that the new revision still meets
8 the --

9 (Crosstalk)

10 CHAIRMAN BROWN: So you're still involved
11 if somebody wants to use an evolution of what you wrote
12 a letter on on the topical reports right?

13 MR. MOSSMAN: I would say two good
14 examples was the Ocone safety evaluation, going back
15 several years. The AREVA platform they used had
16 evolved to some extent since it was originally
17 approved.

18 So part of that safety evaluation was
19 evaluating the updates to the platform. In the case
20 of Rich Stattel, and please correct me if I'm wrong.
21 In the case of Diablo Canyon, they're using the Aventis
22 platform.

23 And there were certain updates since it
24 had, it's topical report had been reviewed by the staff.

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1 And so they actually submitted a delta topical report,
2 which was reviewed prior to submission of the Diablo
3 amendment.

4 And this might be fertile territory for a
5 much, much, much longer discussion on how topical
6 reports have worked or not.

7 CHAIRMAN BROWN: No, I'm just trying to,
8 I'm mouse milking this a little bit because I reviewed
9 the Common Q platform topical report, and I reviewed
10 the Triconex. Which one's used on EPR?

11 MR. MOSSMAN: EPR is the TXX.

12 CHAIRMAN BROWN: I'm sorry. I did the
13 telefirm, and I'd forgotten whether Triconex was.

14 (Crosstalk)

15 MEMBER STETKAR: That's Diablo Canyon.

16 MR. MOSSMAN: That's Diablo.

17 CHAIRMAN BROWN: Okay. But I know I did
18 two of them, and I was recalling because we had asked
19 the questions about the stuff. And I just wanted to
20 make sure I still understood how you all's puppy paw
21 was still firmly planted on any new versions of this
22 thing that comes along, as they're applied.

23 And you say, your letter is, I don't want
24 to use the word prescriptive, but it's very restrictive

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1 in terms of what we actually approved.

2 MR. MOSSMAN: Yes.

3 CHAIRMAN BROWN: And anything different
4 than that, they'd have to identify it. And you'd go
5 through the stork dance again.

6 MR. MOSSMAN: And I think you'll find with
7 some of the, I know the recent ones I've seen, there's
8 a significant number of applicant ASAIs,
9 application-specific action items.

10 So it really goes to what, kind of ghosting
11 what Ian said. It's great that they went through some
12 equipment qualification testing. And we evaluate that
13 they took the appropriate steps to do that.

14 But it doesn't guarantee that they're
15 going to put it in the plant in an environment that is
16 covered by that envelope. That's still something
17 that's incumbent on the licensee to confirm.

18 And there's an awful lot of actions in the
19 topical report SE's that identify things the eventual
20 applicant still has to confirm.

21 CHAIRMAN BROWN: All right, thank you.

22 MR. MOSSMAN: All right, Slide 31. The
23 development activities addressed in 7.2.1 address all
24 aspects of I&C system development from --

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1 CHAIRMAN BROWN: Oh, I got one other
2 question.

3 MR. MOSSMAN: Go ahead.

4 CHAIRMAN BROWN: One other quick, I'm
5 sorry. I lost, we've got to get back to the quality
6 section again. I noticed that you just recently went
7 through the reviewing and providing a report on the
8 suite of six software guides.

9 MR. MOSSMAN: Yes.

10 CHAIRMAN BROWN: Now did you, they're
11 listed in here somewhere.

12 MR. MOSSMAN: They are.

13 CHAIRMAN BROWN: My question is were you
14 all specific?

15 MR. MOSSMAN: Yes.

16 CHAIRMAN BROWN: Did you all identify each
17 of them?

18 MR. MOSSMAN: Yes.

19 CHAIRMAN BROWN: But I didn't have the
20 time to go back and see. Is it the same that we finished
21 reviewing?

22 MR. MOSSMAN: Yes.

23 MR. JUNG: We recently went through that
24 after the final issuance.

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1 CHAIRMAN BROWN: Okay. So nothing was
2 grandfathered? That's all I'm saying is you didn't
3 grandfather anything.

4 MR. MOSSMAN: Correct.

5 CHAIRMAN BROWN: This is the more recent
6 stuff.

7 MR. MOSSMAN: In fact, Joe can probably
8 talk to it a little more intelligently than I can or
9 maybe the projects' folks. The way we capture
10 referencing reg guides is not married to an exact.

11 There's a phraseology here about the
12 version in place six months before the docket date of
13 the application. We've heard of reg guides, so in the
14 event that we get an application in five years from now
15 and one of those guides gets updated, this still
16 addresses it. We don't get into the game of --

17 CHAIRMAN BROWN: No, I remember seeing the
18 update type thing. I just wanted, where we are right
19 now, just trying to get a timestamp on what's in here.

20 MR. MOSSMAN: All right, the development
21 activities covered in 7.2.1 address all aspects of I&C
22 system development from concepts through retirement
23 planning, including both hardware and software
24 components as I&C quality is not exclusively focused

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1 on software, although many of the unique aspects of I&C
2 quality are a result of software development processes.

3 To note, specific sections are included
4 covering software development controls for quality
5 assurance, verification and validation and
6 configuration management in 7.2.1.

7 MR. JUNG: One thing to note here is we are
8 using, in this guidance one thing that we broadened a
9 little bit is actually the term system shows up along
10 with the software because separate software out of
11 system is almost arbitrary in the sense that software
12 performs the system functions.

13 So instead of highlighting software
14 itself, the overall guidance is have the staff to look
15 at more broader sense in addition to software. Look
16 at the overall system development's life cycle.

17 That's where the overall QA programs
18 designed for all SSCs. And there's a conscious effort
19 to kind of broaden the thinking of the staff overall.
20 Most all of the development process out there are
21 product development cycle under which system
22 development is subset under which is software
23 development is another subset.

24 So we wanted to look at it more as a system.

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1 So the system is looked at such a way that it really
2 provides a broader capture of the quality as a whole,
3 not just the software isolated look.

4 CHAIRMAN BROWN: Okay. Thank you.

5 MR. MOSSMAN: Next slide. With respect
6 to the review interface that we're establishing with
7 the vendor quality branch, and I do want to take the
8 moment to thank Paul Prescott and Mary Anderson and
9 Eugene, who I don't know if he's here, who provided a
10 significant amount of help to us in helping further
11 define this interface.

12 In 2013, I&C and vendor quality staff
13 jointly initiated an effort to further identify areas
14 related to I&C quality where our two staffs could
15 efficiently and effectively work together.

16 Staff expects that this coordination
17 between I&C and quality staffs will produce a much more
18 structured review. The vendor quality staff not only
19 has significant expertise in Appendix B programs, but
20 the quality staff have extensive staff in reporting,
21 performing inspections of QA programs.

22 Some of the things we're envisioning as
23 part of the review coordination would be to have an
24 inspection or inspections led by the QA staff and

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1 supported by technical staff to verify the adequacy and
2 implementation of programmatic controls.

3 Imagine that inspections have a more, are
4 a more regulatory process than audits that are
5 typically done by the regulatory staff. Inspections
6 are done in accordance with SRP Section 17.5 and that
7 inspection report, which support development of safety
8 evaluation input.

9 Inspecting the implementation ensures
10 vendor processes provide reasonable assurance to the
11 quality of the product. Vendor quality staff safety
12 evaluation input, which supplement DSRS 7.2.1
13 technical staff review.

14 And that's something we're working on,
15 kind of dotting the I's and crossing all the T's, but
16 our expectation is we're going to arrive at a more
17 efficient and effective process for assessing I&C
18 quality.

19 We're currently working through the
20 interdivisional agreement to make sure our roles are
21 defined moving forward. And as with a lot of things
22 involving interfaces, we actually look forward to
23 piloting this and rolling what we learned back into the
24 guidance.

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1 MEMBER SCHULTZ: Your timing is
2 excellent. I'm glad that you've had the forethought
3 to have these discussions and set in place a program
4 in this area that includes both the quality assurance
5 experience as well as the technical experience and
6 integrates it in the appropriate fashion. This is
7 excellent.

8 MR. MOSSMAN: Thank you.

9 MR. SANTOS: This is Don Santos. One area
10 we're also watching closely is the current construction
11 experience and development process going on with
12 AP1000, not only as it relates to Part 52 but overall.

13 And take those lessons learned and
14 directly reflect with our guidance moving forward
15 because even as of today, we have identified some areas
16 where we need to improve the way we wrote some of the
17 items, like ITAAC and other items. I just want to add
18 that.

19 MR. MOSSMAN: Thank you.

20 CONSULTANT HECHT: So the conclusion is
21 that basically with respect to the software and the I&C
22 computer platforms that are used, there's basically not
23 too much of a difference between an upgrade in the
24 conventional plant and what you would be doing here if

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1 the platforms are the same. Is that not true?

2 If somebody's putting a Triconex PLC into
3 an upgrade I&C system in a conventional plant, would
4 not the commercial dedication and the qualification of
5 the equipment and the action items with respect to the
6 application and to the environment, would that not be
7 the same for the old control room as it would be in a
8 new reactor and specifically in this modular reactor?

9 MR. JUNG: It would be the same.

10 CHAIRMAN BROWN: Let me ask one general
11 question. SMRs versus, and I may have lost the bubble
12 in some of our other discussions, versus the LWRs, the
13 large-water reactors. Okay.

14 The concept or what I've been hearing,
15 although not explicitly all the time, was the concept
16 of control rooms staffing has not been, they want to
17 reduce it.

18 And that has not been resolved and is not
19 really addressed at least relative to the I&C world by
20 constraining or articulating or dictating the display
21 methodologies and/or transmittal of data to, as opposed
22 to in a little local control room to some other
23 facility.

24 That's where part of this control of access

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1 gets more important, but I don't see that that's been,
2 what is this difference in operating philosophy and
3 manning and central control room. When is that going
4 to get addressed?

5 MR. JUNG: I'll refer to our project
6 partners, their set of regulations and policies,
7 ongoing interactions in place. That's what I know, but
8 it hasn't come to the surface of the I&C community with
9 certainly exactly what it is, what is the policy agency
10 position is. So right now we are focusing on sort of
11 traditional --

12 CHAIRMAN BROWN: I don't have a, I was
13 asking because I was just kind of curious as to where
14 we're going. And with the delays, is that going to be
15 slowed down as well because totally different concept
16 in terms of the number of people and what and everything
17 else from what I've been hearing. Looks like somebody
18 wants to speak.

19 MR. PIERINGER: Paul Pieringer, Human
20 Factors. The last we've seen is results of their R&D
21 efforts. Nothing's been finalized on how that human
22 system interface is displayed in the control room.

23 We've seen mock ups of the control where
24 they're actually trying out different combinations of

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1 data input to try and communicate to the operator the
2 status of a number of different modules at the same
3 time.

4 But, of course, there's been no submittal
5 on the small modulars. We're in pre-application
6 space, so I'm telling you things that we've seen via
7 that. As far as I can tell looking ahead, I think we've
8 clearly communicated that their staffing has to be
9 supported by a task analysis that says that they can
10 manage the workload.

11 That workload has to be demonstrated in an
12 analytical fashion, then has to be demonstrated via an
13 integrated system validation process, that the
14 operators they assign can actually perform the workload
15 that they've analyzed.

16 Now that's all theory. In practice, we're
17 still just watching the prototype being developed on
18 the simulators. I would say that they are using the
19 simulators in an excellent fashion to help develop that
20 design.

21 CHAIRMAN BROWN: You are simulating
22 something like six different modules all being
23 controlled by one operator. Maybe that's
24 exaggeration, but --

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1 MR. PIERINGER: That's the concept, but
2 what we've communicated is they would have to
3 demonstrate that, yes. It's not a clear path yet.

4 CHAIRMAN BROWN: That's a tough road to
5 walk down.

6 MR. MAGRUDER: This is Stewart Magruder
7 from the staff. I agree with everything Paul said. I
8 just want to add that we've looked at the regulatory
9 requirements, and with regard to the HFE and I&C
10 interface, we don't think there are any rules or
11 guidance that need to be changed.

12 It's just that the applicants would have
13 to demonstrate, to our satisfaction, that they can
14 still meet all our requirements. There is a rule
15 that's very prescriptive on the number of licensed
16 operators you need in the control room.

17 And the first couple vendors, mPower and
18 New Scale had said they probably will look for an
19 exemption to that specific requirement. As Paul said,
20 they still have to demonstrate through their HFE
21 program and task analysis and other things that they
22 can justify that.

23 But that's the only regulatory change that
24 we think we need between the SMR designs and the

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1 large-water ones.

2 MEMBER STETKAR: This is a good meeting.
3 I had a question. I was going to wait until the end,
4 and since we're almost at the end, I can ask it. And
5 this is a good segue to it.

6 There is a section in the DSRS that talks
7 about multi-unit something or others. It is there.
8 It's written, as I read it, it's written from the
9 perspective of a traditional large reactor two unit
10 with perhaps shared, I imagine things like shared
11 electric power supplies.

12 So we have a lot of templates of two unit
13 sites where they share cooling water and they share
14 electric power and that sort of thing. It says that
15 safety systems, I don't know whether it's shell or
16 scooter, muster, and otter or whatever ought not to be
17 shared.

18 And it says you need to think about effects
19 from non-safety to safety and all that good stuff. On
20 these, I don't actually know because I haven't really
21 thought about them very much, how a multi-module, I
22 understand the reactor side of things.

23 Okay. I think I do. I'm not sure, but not
24 on the secondary side. I don't know how they're going

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1 to gang these things together. For example, will there
2 be, could there be an integrated secondary control
3 system so that I'm controlling electric power supply
4 from two, four, six, eight, you name it generators.

5 Or if I'm developing one of these things
6 for a process heat supply, process heat supply from pick
7 a number, two, four, six, eight secondary. It's all
8 non-safety related stuff.

9 But it's akin to an integrated control
10 system across multiple units out on the secondary side.
11 That, in principle, could create, the guidance right
12 now says no design basis event on, let's say, Unit
13 Number 2 shall create a problem over on Unit 1.

14 But it's always written in a sense of a
15 design-basis event on Unit B not affecting Unit A as
16 if I only have two of these things. But it might be
17 a bizarre event that affects like 12 units out on the
18 secondary side that creates something that you've never
19 thought about.

20 It's kind of a Chapter 15 issue, but it
21 delves into the I&C area because if there indeed is that
22 type of broadly integrated control system out on the
23 secondary side, the review of that might be different
24 than just simply looking in the traditional sense of

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1 two units, let's say, that might share an electric power
2 distribution network.

3 MS. STAREFOS: This is Joelle Starefos.
4 That's an excellent point, and this is one of the
5 examples where the design-specific review standard was
6 specific for mPower. In this case, we've been doing
7 an extensive pre-application.

8 And they told us this is their plan, to have
9 more of a traditional, non-safety related crosstie
10 between the units, no safety-related shared components
11 with the exception of a control room. And the
12 secondary side would be individual to the one and one.

13 MEMBER STETKAR: One and one. Okay.

14 (Crosstalk)

15 MEMBER STETKAR: What do you mean by one
16 and one?

17 MS. STAREFOS: Well, it's a dual unit
18 plant, so it'll have one reactor, one turbine, one
19 reactor, one turbine. And there will be some shared
20 --

21 MEMBER STETKAR: But they're not
22 controlling turbines, they're not trying to control
23 four turbines to balance loads on the four reactors?

24 MS. STAREFOS: No, not that we've been

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1 told to this point.

2 CHAIRMAN BROWN: They're not going to
3 share secondary systems is what you're saying --

4 MS. STAREFOS: That's our expectation.

5 CHAIRMAN BROWN: -- save a couple turbine
6 generators.

7 MS. STAREFOS: Yes.

8 CHAIRMAN BROWN: Every module will have
9 its own generator, and the only sharing would be on the
10 electrical side as it connects into the grid.

11 MS. STAREFOS: Right, and that was one of
12 the, that's the reason we've been --

13 (Off microphone discussion)

14 MEMBER STETKAR: It's a box with three
15 terminals.

16 CHAIRMAN BROWN: No, I was going to point
17 out for no other reason other than we've done this
18 before. If you look at the Enterprise, it had two
19 reactors, shared steam feeding one's turbine and two
20 turbine generator sets. And --

21 MEMBER BLEY: Only under unusual
22 conditions.

23 CHAIRMAN BROWN: That's okay. We don't
24 need to talk about the Enterprise. My point being is

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1 that there were four shafts. There were eight
2 reactors. This is all public, two reactors per shaft.

3 And there were two turbine generators of,
4 fundamentally associated with each paired set of
5 reactors. And so, I mean you could cross-connect steam
6 all types of circumstances.

7 But it created some complexity in terms of
8 operations. That's my only point, and as long as
9 they're going reactor, turbine, electric grid side,
10 that's, we do that today.

11 (Crosstalk)

12 CHAIRMAN BROWN: Less complicated. Boy,
13 you go the other way, and you start looking at the
14 effects from steam plants back into the individual
15 modules. It's really nasty.

16 MS. STAREFOS: And I think because of the
17 unique differences in the designs that we saw, that was
18 one of the reasons that it resulted into a
19 design-specific review standard.

20 And we have one for each design that we
21 started working down. We recognize there are
22 challenges with different configurations, and that
23 might cause us to translate Chapter 7 a little
24 differently for the different designs.

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1 And certainly we'll have to revisit and
2 think about that those general aspects if we decide to
3 take this any further and cross agency. And that's one
4 of the reasons that we're hesitant to say this should
5 be applicable to everything because I think we need to
6 think about all of the opportunities that we could apply
7 this and challenges with this as well.

8 CHAIRMAN BROWN: One other point to make
9 in terms of experience. You forget six modules.
10 They're all generating, controlling their own. And if
11 they came in and said well gee, we only need to have
12 one operator controlling all of this.

13 And again, I'm not giving anything away
14 relative to the new aircraft carrier design. There's
15 two reactors. That's public knowledge, and there's a
16 central control room. One of the thought processes we
17 went through was could we, one of the emphases on that
18 ship was to try to reduce manning.

19 Manning is dollars in all aspects, okay.
20 And we looked at can we go to a single operator and a
21 single officer, watch officer to control both of those
22 reactors. And we eventually said no.

23 And there's other, I mean it's a battle.
24 You got to worry about battle damage and fighting and

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1 doing all kinds of other stuff. So we ended up with
2 an operator freeze reactor and an officer freeze
3 reactor.

4 So endearing officer to large propulsion
5 plant, whatever you want to call him. So I'm just
6 saying if they start proposing that, you really, it's
7 just a caution.

8 You really got to be careful to think that
9 one guy, one operator, qualified or whatever the
10 simulators tell you you can do, you ought to be pretty
11 careful about thinking one or two guys can control six
12 different reactors.

13 MEMBER BLEY: Especially with some
14 external insult.

15 CHAIRMAN BROWN: It doesn't take much to
16 mess up the control in the endpoint.

17 MS. STAREFOS: And that's why I would say
18 that that's why our guidance for exemptions is pretty
19 thorough. We would do a thorough review of any kind
20 of approach if they choose to do that. And the
21 documentation should be pretty thorough for that.

22 CHAIRMAN BROWN: Just cautionary
23 comments.

24 MS. STAREFOS: Thank you.

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1 CHAIRMAN BROWN: Motherhood. Okay.
2 That's your summary?

3 MR. MOSSMAN: Yes, in summary, the DSRS
4 Chapter 7 guidance is complete and ready to use. Staff
5 is interacting with a wide variety of audiences during
6 the development process, including external
7 stakeholders, other NRC staff and the ACRS.

8 We believe the use of this guidance should
9 result in a more efficient and effective licensing
10 review for the mPower design. Next slide. While we
11 are waiting word on the future of the mPower design and
12 its schedule, staff will consider other opportunities
13 to apply this guidance.

14 Those opportunities will be identified on
15 a case-by-case basis and may include migration to
16 another DSRS and/or other guidance documents, as
17 appropriate. In any event, we look forward to being
18 able to pilot this guidance and fold lessons learned
19 back into the product.

20 CHAIRMAN BROWN: Okay. I would like to
21 make one other, before I call on my colleagues in
22 calibrating. And I use that phraseology. I would,
23 we've made a number of comments.

24 And we just recommend that you at least go

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1 look at them and see if there's anything that should
2 be used in a few of the clarification areas to
3 incorporate similar to what you did with the other ones.

4 The second point is if, I mean we will be
5 writing, we're going to have a full committee meeting
6 on this in July. And so we will be writing our report,
7 and we'll have to compress this a little bit.

8 And there's obviously, there's plenty of
9 places you can scale this down a little a bit to say
10 what you've done and get it into about an hour and a
11 half or so, roughly an hour and a half.

12 That would probably mean 45 minutes or so
13 of briefing and leaving some time for the normal
14 discourse that goes on. The third point, so be
15 prepared for that.

16 If you've got any questions, you can talk
17 to Christina. And we can think about them if you have
18 suggestions or something you want to do or not do.
19 Third thing is if there's something major that comes
20 up requesting that you give us a chance, if something
21 pops up that you need to make a major reboot of some
22 area that we would get a chance to see.

23 This is after we finish the full committee
24 meeting, so those are the last three items I had. And

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1 I'll call on the members. Dennis, you have anything
2 else?

3 MEMBER BLEY: Nothing additional from me,
4 but I appreciated the discussion today very much.

5 CHAIRMAN BROWN: Steve?

6 MEMBER SCHULTZ: I have nothing
7 additional. I think we talked about some very
8 important items today. My general comment would be we
9 talked about control of access and Fukushima lessons
10 learned is something that is still out there to gather
11 and kind of long-term things.

12 And yet this is a specific application, and
13 I think it would be a disservice if we can't figure a
14 way to capture and apply elements associated with each
15 of those areas and make sure that we apply whatever best
16 practices we can to the mPower design activities.

17 And we talked about the risk-informed
18 characteristics and approaches. And using those
19 approaches appropriately can help us to accomplish that
20 with the mPower specific application.

21 I think that should help here. I guess
22 we'll come back to it perhaps again and again, depending
23 on what the schedule is for mPower. But I'm still
24 concerned because I think the committee members will

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1 be in a position where we have to apply a 1991 standard
2 to reactors that are being designed today.

3 That's a long time ago, and in
4 consideration of, as we discussed yesterday, the fact
5 that that was derived on the basis of 1980's technology.

6 To be applying that to a new generation of
7 reactors is a disappointment. So hopefully we can work
8 our way through that with the applicant as well.
9 That's it.

10 CHAIRMAN BROWN: John?

11 MEMBER STETKAR: I don't have anything
12 more to add. I've ranted enough.

13 CHAIRMAN BROWN: Myron, do you have any --

14 (Crosstalk)

15 (Laughter)

16 CHAIRMAN BROWN: Would you go check the
17 phone line, please, to make sure it's open? While
18 she's doing that I'll just chime in. I gave you my
19 points a few minutes ago, so I'm not going to add
20 anything more.

21 I thought you all did an excellent job, and
22 I think as a subcommittee we appreciate your diligence
23 and particularly of culling through the transcript from
24 the last meeting, which was fairly extensive, a lot of

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1 stuff in there.

2 And the fact that you made the effort to
3 do that and incorporate it into the new standard is,
4 I think, very commendable. So I want to thank you all
5 for that. It's much appreciated.

6 Will somebody say something on the phone
7 line to make sure that they're really open, and there's
8 somebody there?

9 MR. LEWIS: Yes, I don't know that you'd
10 opened up the questions. Marvin, M-A-R-V-I-N, Lewis,
11 L-E-W-I-S.

12 CHAIRMAN BROWN: Yes, I am now opening it
13 Marvin, so you can fire away.

14 MR. LEWIS: All right, well first of all,
15 I want to commend the gentleman who pointed out that
16 there might be more than one reactor involved. Before
17 we had the Fukushima accident, the rule was, not rule,
18 I don't know rule, regulation or guidance.

19 The rule was that if one reactor has a
20 problem, it doesn't, you're not allowed to raise it as
21 an issue that there might be a problem with the second
22 reactor or the site.

23 Obviously, Fukushima showed us, I hope,
24 that we have one reactor involved and another reactor

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1 nearby, you better believe that there can be
2 interaction. The other thing is, let's see, who's the
3 contact person on this? I'm sorry. I forget the
4 contact person.

5 CHAIRMAN BROWN: Christina.

6 MR. LEWIS: Christina, yes. Christina, I
7 have your phone number, Christina. I don't have your
8 email.

9 MS. ANTONESCU: 301-415 --

10 CHAIRMAN BROWN: He's got the phone
11 number.

12 MS. ANTONESCU: Oh.

13 MR. LEWIS: I'm asking your email.

14 MS. ANTONESCU: Same as my name, and a dot.
15 Christina.Antonescu@nrc.gov.

16 MR. LEWIS: Oh okay, thank you. Finally,
17 all right, I understand that you're looking at
18 interaction on I&C, which is a great idea, which is a
19 wonderful idea. But I don't hear any interaction with
20 the Internet.

21 Are you sure that the equipment cannot be
22 affected, effected, whatever, that would be affected
23 by a spuxnet worm or something of that nature?

24 CHAIRMAN BROWN: We hear you. We

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1 understand your comment.

2 MR. LEWIS: I ended with a question mark.

3 CHAIRMAN BROWN: Okay. We understand
4 your question. We will deal with that. I've made a
5 note.

6 MR. LEWIS: You'll deal with it. All
7 right, well will Christina send me the price to deal
8 with that?

9 MS. ANTONESCU: We will follow up with
10 you.

11 MR. LEWIS: I'm sorry?

12 MS. ANTONESCU: We will follow up on your
13 concerns.

14 MR. LEWIS: Wonderful, and finally,
15 apparently there's been five very large coronal mass
16 expulsions by the sun, sunspots. I forget the name of
17 the astronomer, and of course --

18 (Crosstalk)

19 MR. LEWIS: -- situation I presume.

20 CHAIRMAN BROWN: Do you have any other
21 comments?

22 MR. LEWIS: No.

23 CHAIRMAN BROWN: Okay. Thank you,
24 Marvin. Is anyone else on the line?

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1 MR. LANG: This is Glenn Lang. I have no
2 comment.

3 CHAIRMAN BROWN: Okay. That's Number 2.
4 Anybody else? Hearing none, is there anybody in the
5 audience that has any initial, astute observations
6 they'd like to pass on? Hearing none, I will make sure
7 there's no other comments relative from you guys, if
8 you thought about any new ones. And we'll proceed.
9 The meeting is adjourned. And thank you very much.

10 (Whereupon, the meeting in the
11 above-entitled matter was concluded at 11:55 a.m.)

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Protecting People and the Environment

mPower Design-Specific Review Standard, Chapter 7: Status Update

Tim Mossman

Ian Jung

Joseph Ashcraft

Joelle Starefos

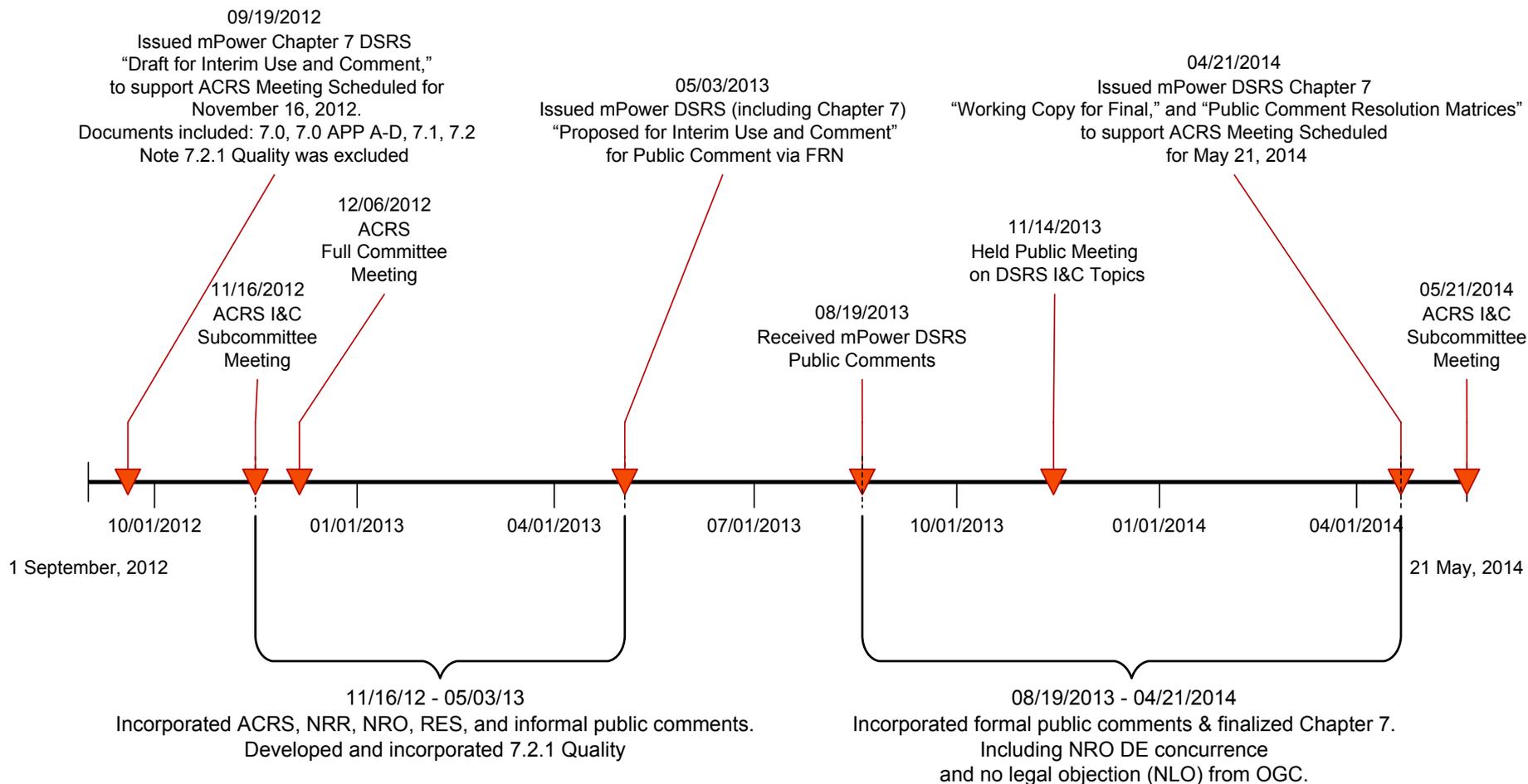
Office of New Reactors

May 2014

Agenda

- Chapter 7 Timeline
- Public Outreach
- Objectives
- Summary of Formal Public Comments
- Changes to DSRS Chapter 7
 - Incorporation of ACRS recommendations
 - Incorporation of other ACRS comments
- Development of 7.2.1, Quality
- Summary
- Path Forward

mPower DSRS Chapter 7 Timeline in Support of ACRS Meetings



Public Outreach

- Public meeting held in November 2013 to discuss I&C topics and resolution of public comments. Staff presentations included:
 - New Quality Section (7.2.1)
 - Control of Access
 - Hazard Analysis

Objectives

- Reorganize review guidance
- Remove redundant and non-applicable information
- Incorporate lessons learned from large light-water reviews
- Emphasize the use of hazard analysis as a tool to communicate compliance with requirements

Summary Formal Public Comments

- Comments primarily received from Generation mPower, NEI, and NuScale
- The full DSRS received nearly 2000 comments
 - 119 comments received on Chapter 7
- None of the resulting comment resolutions altered the staff's approach to Chapter 7

ACRS Recommendation 1

- DSRS Chapter 7 should be issued for industry and public comment
 - Completed
 - DSRS Chapter 7 issued for public comment on May 3, 2013

ACRS Recommendation 2

- DSRS provides a review standard that is likely to be applicable to large reactor designs...[and] other...SMRs.
 - Staff agrees and will look for opportunities to pilot the guidance

ACRS Recommendation 3

- ACRS recommended a specific design implementation to comply with control of access
 - Staff acknowledges the Committee’s concern and position
 - Resolution of this recommendation to have wider applicability than just for the mPower DSRS
 - The staff intends to develop a SECY paper regarding a number of I&C technical issues

ACRS Recommendation 4

- Augment DSRS Chapter 7, Appendix B, Instrumentation and Controls System Architecture.
 - The staff expanded the detail in I&C system architecture item 1 to reflect that sufficient information is necessary to demonstrate that the proposed architecture is robust
 - The next slide reflects additional changes that the staff intends to incorporate in item 3

ACRS Recommendation 4 (cont.)

3. Diagrams of the overall architecture **should illustrate the I&C system architecture principles and concepts (as addressed in Item 1 above). The staff review should ensure that sufficient detail is provided as follows:**
 - A. All of the safety systems and relevant control systems are identified.
 - B. Connections between the above systems are identified.
 - C. Signal / data barrier devices are identified.

Other ACRS Comments – 7.0

Introduction

- Comment:
 - State the level of information that will be provided in the application that should be sufficient to address the fundamental principles and additional functional and design characteristics of the I&C design. Repeat in other “Review Process” sections of DSRS, as appropriate.
- Staff response:
 - Revised 7.0 subsections:
 - I&C System Review Scope
 - I&C System Review Objectives
 - DSRS Chapter 7 Acceptance Criteria and Review Process

Other ACRS Comments – Table 7-1

- Comment:
 - TMI Action Item 50.34(f)(2)(xix) – who reviews the instruments that have to function following core damage (beyond design basis events)?
- Staff response:
 - Section 7.2.13 identifies an interdisciplinary team consisting of I&C (lead), Probabilistic Risk Assessment (PRA) and Severe Accidents, Reactor Systems, and HFE representatives

Other ACRS Comments – Table 7-1

- Comment:
 - TMI Action Item 50.34(f)(2)(xxii) – is this supposed to be a review of a failure modes and effects analysis (FMEA) of an integrated control system or an FMEA of the protection and control system? Ensure that Appendix A addresses hazards from both protection and control functions.
- Staff response:
 - Staff agrees that failure modes of both protection and control functions must be evaluated
 - Appendix A was developed as a tool to present the hazards analysis for all I&C systems for review

Other ACRS Comments – 7.1.1 Safety System Design Basis

- **Comment:**
 - Expand on acceptance criteria for design basis. Provide detail as to what adequate margin means.
- **Staff response:**
 - As now stated in 7.1.1: Additional information on setpoint requirements is in Section 6.8 of IEEE 603-1991, and setpoint guidance is contained Section 7.2.7 of this DSRS.

Other ACRS Comments – 7.1.2 Independence

- **Comment:**
 - Provide guidance to address both reactor trip and engineered safety features subject to lock-up condition
- **Staff response:**
 - Added to Communications Independence, Item 3: *whether the processor controls a reactor trip or engineered safeguards system function*

Other ACRS Comments – 7.1.2 Independence

- **Comment:**
 - Clarify what constitutes satisfactory communications independence
- **Staff response:**
 - Deleted first paragraph of “Communications Independence”
 - Reworded statements in sub-items 5 and 9 to address ACRS comments

Other ACRS Comments – 7.1.3 Redundancy

- **Comment:**
 - Use of RG 1.53 as sole DSRS acceptance criteria for Redundancy may need to be revisited to expand level of review detail.
- **Staff response:**
 - Confirmed consistency with SRP
 - Determined detail to be sufficient

Other ACRS Comments – 7.1.3

Redundancy

- **Comment:**
 - Consider adding review guidance to address different modes of operation that could challenge redundancy
- **Staff response:**
 - “Review Procedures” Item 4 now addresses removal of equipment from service for testing & maintenance.
 - Specific sections of IEEE-603 are also identified which address maintenance and testing.

Other ACRS Comments – 7.1.4

Predictability and Repeatability

- Comment:
 - Revisit use of IEEE 603-1991, Section 4.10, as part of the acceptance criteria for deterministic performance
 - Address completion of protective action from sensor input to safety actuation
- Staff response:
 - IEEE 603-1991, Section 4.10, was referenced in DSRS section 7.1.4
 - Completion of protective action from sensor input to safety actuation is addressed in DSRS section 7.2.3

Other ACRS Comments – 7.1.5 Diversity and Defense-in-Depth

- **Comment:**
 - BTP 7-19 appears to have more technical content and level of detail that could be included in 7.1.5.
- **Staff response:**
 - Detailed paragraph by paragraph verification was conducted to verify that key guidance in BTP 7-19 Rev 6 was included in the DSRS.

Other ACRS Comments – 7.1.5 Diversity and Defense-in-Depth

- **Comment:**
 - What is a credible spurious actuation in the context of software common cause failures? Consider NUREG/CR-6303 and confirm credible spurious actuation is defined and addressed.
- **Staff response:**
 - Staff is addressing this issue outside of the mPower DSRS Chapter 7 project
 - The term “credible” was removed

Other ACRS Comments – 7.1.5 Diversity and Defense-in-Depth

- **Comment:**
 - Review Procedures “Use of Manual Action as a Diverse Means”
 - Item 1 (now item A) change would be to should be
 - Item 2 (now item B) define sufficiently diverse
 - Item 4 (now item D) revisit sentence
- **Staff response:**
 - Multiple statements reworded

Other ACRS Comments – 7.1.5 Diversity and Defense-in-Depth

- **Comment:**
 - Incorporate NUREG/CR-7007
- **Staff response:**
 - NUREG/CR-7007 contains useful technical information
 - Staff has not endorsed NUREG/CR-7007 as part of previous D3 guidance
 - The staff has no plans to endorse NUREG/CR-7007

Other ACRS Comments – 7.1.5 Diversity and Defense-in-Depth

- Comment
 - Review Procedures “Diverse System Characteristics” – move last paragraph to the beginning of the subsection
- Staff response:
 - Paragraph moved

Other ACRS Comments – 7.1.5 Diversity and Defense-in-Depth

- **Comment:**
 - Review Procedures “Additional Considerations for D3 Review”
 - 4.B Testability - revisit wording
 - 1.B and 1.C (now A.ii & A.iii) - provide guidance on review of command prioritization
- **Staff response:**
 - Testability words are from BTP 7-19
 - Command prioritization added in item A.ii and A.iii

Other ACRS Comments – Appendix C Simplicity

- **Comment:**
 - Revisit statements in items 3.D.iii and 4D
 - Provide examples that would clarify the provisions of items 7.C (now 7.B) and 7.D (now deleted)
- **Staff response:**
 - Removed *unless safety system is out of service* in items 3.D.iii and 4.D
 - Example added to subsection 7.B

Other ACRS Comments – 7.2.2 Equipment Qualification

- **Comment:**
 - Consider I&C staff involvement in EQ tests and review of environmental control systems
- **Staff response:**
 - Section 7.0 subsection “I&C System Review Interface” items 6 and 7 were revised to clarify responsibilities for EQ

Other ACRS Comments – I&C Review Roles & Responsibilities

- **Comment:**
 - Clarify I&C review roles and responsibilities in cross-cutting review areas when coordinating system reviews with other disciplines (e.g., equipment qualification, human factors)
- **Staff response:**
 - Much work has been done and office level activities are underway to ensure that roles and responsibilities are identified and interfaces are strengthened

Development of DSRS Section 7.2.1: Quality

- Section was still under development in December 2012
- Section 7.2.1 incorporated review guidance from SRP, including BTP 7-14
- Ensures consistency with 10 CFR 50, Appendix B
- Goal to enhance coordination between I&C reviewers and vendor quality reviewers

Section 7.2.1 Contents

- **System and Software Development Activities**
- **Project Management and Organizational Processes**
- **Software-specific Processes**
 - Quality Assurance (QA)
 - Verification & Validation (V&V)
 - Configuration Management (CM)

Review Interfaces: Quality and I&C Systems

- Efficiency in the review process
- Quality assurance reviewers experience
 - Expertise with the application of Appendix B
 - Qualified QA inspectors with experience in reviewing vendor programs
 - Qualified QA technical review staff experienced in the development of safety evaluations for a vendor's QA program and its implementation

Summary

- Staff guidance is complete and ready to be piloted for a review of digital I&C
- Staff has interacted with numerous stakeholders throughout this process
- Staff achieved the objectives for the guidance, which will contribute to more efficient and effective licensing reviews

Path Forward

- While the date of application for the B&W mPower design is uncertain, the staff is considering other opportunities to use this guidance.
- Those opportunities will be identified on a case-by-case basis.
 - For example, the guidance may be migrated from the mPower DSRS to another DSRS or other guidance document(s), as appropriate.

References

- 05/21/2014 ACRS Future Plant Subcommittee Meeting Materials (mPower Draft DSRS Public Comments; Chapter 7-Digital I&C) ML14107A364
- 05/21/2014 ACRS Future Plant Subcommittee Meeting Materials (mPower DRAFT FINAL DSRS; Chapter 7-Digital I&C) ML14107A265

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