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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

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REGULATORY POLICIES AND PRACTICES SUBCOMMITTEE

+ + + + +

MONDAY

DECEMBER 3, 2012

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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 1 p.m., GORDON R.
SKILLMAN, Chairman, presiding.

1 COMMITTEE MEMBERS:

2 GORDON R. SKILLMAN, Chairman

3 JOY REMPE, Member

4 MICHAEL T. RYAN, Member

5 STEPHEN P. SCHULTZ, Member

6 WILLIAM J. SHACK, Member

7

8 ACRS CONSULTANTS:

9 MARIO BONACA

10 GRAHAM WALLIS

11

12 DESIGNATED FEDERAL OFFICIAL:

13 ZENA ABDULLAHI

14

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8	NRO	
9	Construction Quality Assurance Branch	
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P R O C E E D I N G S

1:13 p.m.

CHAIRMAN SKILLMAN: This meeting will come to order.

This is the meeting of the Regulatory Policies and Practices Subcommittee of the Advisory Committee on Reactor Safeguards. I am Gordon Skillman, the Chairman of this Subcommittee meeting.

The ACRS members in attendance are Joy Rempe, William Shack, and Stephen Schultz. Also in attendance are ACRS consultants Graham Wallis and Mario Bonaca.

Zena Abdullahi is the Designated Federal Official for this meeting.

In today's meeting, the Subcommittee will hear presentations by, and hold discussions with, the NRC staff regarding two regulatory guides, Regulatory Guide 1.79.1, Initial Test Program of Emergency Core Cooling System for New Boiling Water Reactor, Revision 0, dated September 12th, 2012 -- excuse me -- September 2012, and Reg. Guide 1.79, Pre-operational Testing of Emergency Core Cooling Systems for Pressurized Water Reactors, Revision 2, which provides an update to the dated September 1975 revision of Reg. Guide 1.79.

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1 The rules for participation in today's
2 meeting have been announced as part of the notice
3 previously published in The Federal Register. This
4 meeting is open to the public.

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

12 We have provided a listen-only bridge
13 number for the members of the public. Please be
14 advised that the lines may not be very clear, since we
15 are using telephones that are not part of the
16 microphone system.

17 During the discussion of the public
18 comments to Reg. Guide 1.79 and 1.79.1 the staff
19 requests the bridge line be opened for potential
20 comments by GE Hitachi. We would turn off the
21 listening-only mode when the staff is ready for GEH to
22 join the discussion.

23 We will now proceed with the meeting. I
24 call upon Mrs. Kerri Kavanagh, the Branch Chief at
25 NRO, Construction Quality Assurance Branch.

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1 Mrs. Kavanagh?

2 MS. KAVANAGH: Good afternoon.

3 I don't have too many introductory
4 remarks. This has been a long time coming. So, I am
5 going to turn it over to Mr. Talbot.

6 MR. TALBOT: Hi. I am Frank Talbot. I a
7 Reactor Operations Engineer in the NRO Construction
8 and Quality Assurance Branch, and I am the lead
9 technical reviewer for Reg. Guide 179 and Reg. Guide
10 179.1.

11 As part of this presentation, I will give
12 the summary of public comments, a summary of revisions
13 and conclusions, and there are attachment background
14 slides for you to read about the history of the
15 creation of the update to Reg. Guide 179, Revision 2,
16 and the creation of Reg. Guide 179.

17 CONSULTANT WALLIS: I have a question
18 right now. Are you only going to talk about public
19 comments and revisions? I have questions about
20 things, and I don't think they are necessarily
21 revisions. How do I bring those up?

22 MR. TALBOT: Could you repeat your
23 question?

24 CONSULTANT WALLIS: I have questions about
25 what is in some of the guidance.

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1 MR. TALBOT: Yes.

2 CONSULTANT WALLIS: And I am not sure that
3 these refer to revisions.

4 MR. TALBOT: Okay.

5 CONSULTANT WALLIS: I don't see where in
6 your presentation it would be appropriate to bring up
7 those matters.

8 MR. TALBOT: Bring them up as we go along.
9 I am going to go through each --

10 CONSULTANT WALLIS: You are not going to
11 go page by page, though. So, I am not quite sure how
12 I bring them up.

13 MR. TALBOT: Well, I do have both Reg.
14 Guides before me.

15 CONSULTANT WALLIS: Maybe at the end I
16 should just bring up my list of questions.

17 MR. TALBOT: That is fine. At your
18 discretion. This meeting is for you, so that you can
19 ask us any questions that you think appropriate.

20 CONSULTANT WALLIS: Well, maybe you should
21 go through your thing, and then I will see what
22 questions remain.

23 MR. TALBOT: Okay.

24 CONSULTANT WALLIS: Sure. Thank you.

25 MR. TALBOT: Okay. So, as part of the

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1 presentation, we made revisions to Reg. Guide 179 and
2 we created a companion guide, Reg. Guide 179.1, for
3 the BWRs. Then, of course, we have attachment slides
4 that will get into the rest of the specifics.

5 Now let's start off with Reg. Guide 179.
6 These were the major revisions made to Reg. Guide 179.
7 We had five basically regulatory guidance positions
8 added to the Reg. Guide. Reg. Guide C.1.d is for new
9 medium pressure safety injection pre-op tests,
10 primarily for the U.S. EPR. One of the four-loop PWRs
11 in existence today, the Indian Point Unit 2 and 3
12 plant, also has a medium pressure safety injection
13 system.

14 We have another new Reg. Guide, C.1.e, for
15 a new emergency letdown system pre-op test for the
16 APWR. And then, for the AP1000 design, we had three
17 passive core cooling system design features that were
18 added, one for safety injection, one for emergency
19 makeup and boration, and one for emergency core decay
20 heat removal.

21 For the summary of regulatory guidance
22 that was created for Reg. Guide 179.1, for the ABWR
23 and ESBWR, we have added approximately, I think it is
24 either eight or nine regulatory guidance positions.
25 Reg. Guide C.1.a for the high-pressure core flooders

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1 pre-op test; Reg. Guide C.1.b, the automatic
2 depressurization system, which is both the ABWR and
3 the ESBWR; Reg. Guide C.1.c for RCIC pre-op tests and
4 a low-power test, because you need steam to run that
5 system at power. And Reg. Guide C.1.d, gravity drain
6 cooling system instrumentation and flow test.

7 And then, the other four are Reg. Guide
8 C.1.e, isolation condenser system for the ESBWR; Reg
9 Guide C.1.f, the standby liquid control system for the
10 ESBWR, and C.1.g, the low-pressure core flooders or
11 low-pressure coolant injection flow tests for the
12 ABWR.

13 And the last Reg. Guide, C.1.h, covers RHR
14 for the ABWR, and for the ESBWR they have a reactor
15 water cleanup system, shutdown cooling system, heat
16 exchanger that supplies the same function as RHR in
17 the ABWR.

18 The other guidance that was added to both
19 Reg. Guides was Reg. Guide 1.82, which has a lot of
20 guidance related to supporting water source acceptance
21 criteria. In that Reg. Guide, there is a lot of
22 design and test acceptance criteria on safe speed
23 functions associated with sump and suppression pool
24 suction strainers and debris interceptors.

25 CONSULTANT WALLIS: Can I ask you about

1 that?

2 MR. TALBOT: Yes.

3 CONSULTANT WALLIS: I mean, at the
4 beginning of these Reg. Guides, right at the
5 beginning, it cites RG 1.82.

6 MR. TALBOT: Yes.

7 CONSULTANT WALLIS: And it says regulatory
8 positions support acceptance criteria in this Reg.
9 Guide, RG 1.79 or 1.79.1. That is all it says.

10 MR. TALBOT: Yes, that is correct.

11 CONSULTANT WALLIS: Nothing specific in
12 here about what that support is. And there is no
13 citing throughout the thing about how they have used
14 it in some way. So, it seems a very empty sort of
15 statement to me.

16 MR. TALBOT: Yes, it is kind of very small
17 reference to Reg. Guide 1.82.

18 CONSULTANT WALLIS: That is all it is.

19 MR. TALBOT: But the point is that Reg.
20 Guide 1.82 is a 50-page Reg. Guide. It contains all
21 that information.

22 CONSULTANT WALLIS: Yes, but it says it
23 supports. Can you give any example of where it
24 supports anything in this Reg. Guide?

25 MR. TALBOT: One example is prototypical

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1 head loss test acceptance criteria for design strainer
2 test qualification.

3 CONSULTANT WALLIS: But what does that
4 support that is in this guide?

5 MR. TALBOT: Well, this Reg. Guide will
6 obviously test the strainers to make sure --

7 CONSULTANT WALLIS: Okay. Okay. Well,
8 let's go on to that because --

9 MR. TALBOT: That is one example. But it
10 is a very big Reg. Guide, and I didn't want to --

11 CONSULTANT WALLIS: Well, let's go on to
12 that then, okay, if I can find it. There is a
13 statement somewhere here, that they could verify that
14 the strainer is not clogged. Okay. This is on page
15 13 of --

16 MR. TALBOT: I have that Reg. Guide here
17 with me.

18 CONSULTANT WALLIS: What does that mean?
19 Say on page 13 of the BWR one, let's say C.2, "Verify
20 the pump suction strainer is not clogged with debris.
21 What does that mean?"

22 MR. TALBOT: Okay. With respect to
23 Section C.2 for PWRs, but it refers to Section --

24 CONSULTANT WALLIS: It is also in the
25 other Reg. Guide, I think. There is a lot of

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1 duplication here. It says, "Verify the pump suction
2 it not clogged with debris." What does that mean?

3 MR. TALBOT: I may have to write a
4 question for you and get back to you because I don't
5 know if I know --

6 CONSULTANT WALLIS: Does it mean it is so
7 clogged that you get no flow? Does it mean that it is
8 partially clogged? Does it mean there is no debris on
9 it? I mean, what is the measure of clogging? Unless
10 you cite this other guide and say what is acceptable
11 clogging or something, it is a very empty statement.

12 MR. TALBOT: You are talking about a
13 specific test acceptance criteria.

14 CONSULTANT WALLIS: They have to look at
15 the strainer and see if it is clogged, right?

16 MR. TALBOT: Yes.

17 CONSULTANT WALLIS: How do they know it is
18 clogged? Does it have some wispy stuff on it? Does
19 it have a thick be on it? How do they know it is
20 clogged?

21 MR. TALBOT: Yes, you would have to have
22 a --

23 CONSULTANT WALLIS: What does it mean?

24 MR. TALBOT: Yes, I would be talking about
25 a specific, it would be a specific text acceptance

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1 criteria that the licensee certainly would have in the
2 DCD, that particular number for --

3 CONSULTANT WALLIS: Well, is it okay if it
4 is clogged just up to the point where it doesn't
5 produce -- where it interferes with the pump
6 operation? Just up to that point, is that acceptable?
7 I mean, it seems to me you have got to say more about
8 this.

9 MR. TALBOT: Okay. We can certainly take
10 that as a comment and we will look into either
11 providing the exact appropriate reference in Reg.
12 Guide 1.02 where that information exists.

13 CONSULTANT WALLIS: And what do you mean
14 by "acceptable performance"? It says it is not
15 clogged. Is it just looking at it and seeing if there
16 is much stuff on it? Or is it measuring something?
17 Or what is it? Do you see what I mean?

18 MR. TALBOT: Yes.

19 CONSULTANT WALLIS: Maybe it is half-
20 clogged. Maybe half of it is jammed up solid and
21 there is a little bit of strainer working. Is that
22 acceptable?

23 MR. TALBOT: The exact acceptance
24 criteria, so that it doesn't damage the pump, is the
25 information that you are looking for.

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1 CONSULTANT WALLIS: I don't know if that
2 is the case. Because if it in a test and it has
3 debris in it, even if it doesn't damage the pump, I
4 would be worried --

5 MR. TALBOT: Yes.

6 CONSULTANT WALLIS: -- if there is a lot
7 of unexpected debris.

8 MEMBER SHACK: Well, I mean, I took a very
9 literal-minded approach, that you were looking for
10 loose gunk laying around the plant.

11 CONSULTANT WALLIS: Looking for anything.

12 MEMBER SHACK: I mean, obviously, most of
13 the debris is going to be generated in an accident.

14 CONSULTANT WALLIS: Oh, to me, it means it
15 is jammed up solid. When my septic tank clogs, it
16 doesn't work. It has got all kinds of debris in it.
17 When it clogs, it doesn't work.

18 And so, I think you have got to be
19 specific about what you mean. Are you looking for
20 some debris or so much debris that the pump doesn't
21 work? Or what are you looking for? What is
22 acceptable?

23 MEMBER REMPE: And how do you ensure
24 consistency from one plant to another? Because it
25 seems like, throughout these Reg. Guides, there is a

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1 lot of "sufficient" and "acceptable" and all that.
2 The staff differs --

3 MR. TALBOT: That was one thing that was
4 very difficult for me because I didn't want to take
5 information from another Reg. Guide that had all that
6 specific information in it. Why repeat the
7 information that is in the other Reg. Guide?

8 So, the best thing I could come up with
9 was just put a pointer to it. But, from a test point
10 of view, you do have to have the specific acceptance
11 criteria.

12 CONSULTANT WALLIS: A licensee could run
13 this test, and there is a lot of debris on this tray,
14 which is very unexpected, because it should be pretty
15 clean, right?

16 MR. TALBOT: Right.

17 CONSULTANT WALLIS: And then, he says,
18 "Well, it is okay because it wasn't clogged."

19 CHAIRMAN SKILLMAN: Frank, I would like to
20 join this conversation, but from this perspective:
21 what Dr. Wallis is pointing out is an issue, in my
22 judgment, of the need for specificity.

23 MR. TALBOT: Yes.

24 CHAIRMAN SKILLMAN: Okay. Now let me just
25 pull this thread a little bit further. In Reg. Guide

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1 1.79, at 1.e, System Testing, the old words are
2 "verify proper operation of system valves". "Verify
3 proper operation" --

4 MR. TALBOT: What page are you on?

5 CHAIRMAN SKILLMAN: I am on Reg. Guide
6 1.79, Rev 2, page 4, middle of the page at "echo",
7 "e".

8 Now I want to stay on this notion that Dr.
9 Wallis has pointed to.

10 MR. TALBOT: Okay.

11 CHAIRMAN SKILLMAN: In this particular
12 Reg. Guide --

13 MR. TALBOT: Could I comment on your
14 "echo"?

15 CHAIRMAN SKILLMAN: Yes.

16 MR. TALBOT: "Verify proper operation of
17 system valves" is very broad, high-level.

18 CHAIRMAN SKILLMAN: Absolutely.

19 MR. TALBOT: And I agree with you. But in
20 this particular Reg. Guide, what we tried to do was
21 simplify the system-level description. But if you go
22 to component-level description, it has a lot more
23 specificity on how to test the valves.

24 So, if go farther into the Reg. Guide --

25 CHAIRMAN SKILLMAN: Okay.

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1 MR. TALBOT: -- and go to past
2 documentation, you know, before documentation, go to
3 component testing.

4 MEMBER REMPE: Page?

5 MR. TALBOT: And page 8 and then page 9,
6 and then go to valves. One thing I was asked to do
7 was simplify the system test description and then put
8 all the specificity related to component testing in
9 C.2.e. So, if you go to valves -- and this guidance
10 is not only in Reg. Guide 1.79, it is also in Reg.
11 Guide 1.79.1.

12 CHAIRMAN SKILLMAN: Okay, I am in valves,
13 which is "bravo".

14 MR. TALBOT: Yes, page 9.

15 CHAIRMAN SKILLMAN: And I am on page 9 of
16 Reg. Guide 1.79, Rev. 2, right?

17 MR. TALBOT: That is correct.

18 CHAIRMAN SKILLMAN: And I see "bravo" 1,
19 2, and 3.

20 MR. TALBOT: That is correct. And that
21 has got more of the specificity I think you were
22 looking for related to testing of valves. And this
23 same guidance also exists in Reg. Guide 1.79.1.

24 MEMBER SHACK: Let me try my crack at
25 this. In 1.68, there is a statement that says,

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1 "Approved test procedures for satisfying FSAR testing
2 commitments should be made available to the NRC
3 approximately 60 days prior to their intended use,"
4 which would give, again, the NRC the chance to look at
5 these procedures in considerable detail. I don't see
6 a comparable statement in 1.79 or 1.79.1. Is the
7 intent that this same sort of thing should be -- that
8 detailed test procedures will be available for the NRC
9 to look at 60 days?

10 MR. TALBOT: Yes, it is the same exact
11 guidance in Reg. Guide 168, Revision 4, which is
12 DG-1259, which is going to go out for public comment.
13 As a matter of fact, I take that back, it is publicly
14 available now.

15 MEMBER SHACK: It is?

16 MR. TALBOT: DG-1259 on November 30th was
17 just issued for public comment, and that guidance
18 currently exists and applies to Reg. Guide 1.79 and
19 Reg. Guide 1.79.1.

20 MEMBER SHACK: Wouldn't it be useful to
21 include a statement like that directly in the Reg.
22 Guides, just so they don't have to refer back to 1.68,
23 although you do refer to 1.68 in the Guide; I admit
24 that.

25 MR. TALBOT: Yes, I do.

1 MEMBER SHACK: But this seems to me an
2 important missed statement.

3 MR. TALBOT: I don't know if I need to say
4 that repeatedly. Because if you look at DG-1259, Reg.
5 Guide 1.68, Rev. 4, which is available for public
6 comment, there is over 40 reference documents; 30-
7 some-odd number of those documents are Reg. Guides.
8 We would be repeating the same information.

9 MEMBER SHACK: Well, no, the only
10 statement I want is the fact that you want these test
11 procedures to be available for the NRC --

12 MR. TALBOT: yes.

13 MEMBER SHACK: -- 60 days before. That is
14 the only statement I am looking for to include in the
15 1.79.

16 MR. TALBOT: We could add something to
17 1.79 or 1.79.1. I am not sure it is necessary. It
18 seems repetitive to me if it is in the motherhood Reg.
19 Guide, because Reg. Guide 1.68 is already --

20 MEMBER SHACK: I can understand the
21 argument that it is the mother Reg. Guide, but --

22 MR. TALBOT: Yes.

23 MEMBER SHACK: -- again, these things
24 start to become capitated to a certain level, it seems
25 to me. You know, it is a simple enough statement.

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1 MR. TALBOT: Right. But I will repeat
2 myself. DG-1259 is now publicly available. It was
3 issued on November 30th. That guidance is in there,
4 and all the Reg. Guides that are referenced in Reg.
5 Guide 1.68, including these two, have that same
6 regulatory guidance. The procedures need to be
7 available 60 days prior to intended use.

8 MS. KAVANAGH: This is Kerri Kavanagh, the
9 Chief of the Quality Assurance Branch.

10 We will take that comment back and
11 evaluate the Reg. Guide as necessary.

12 MR. TALBOT: But I guess we could add, I
13 am open to improvements in the Reg. Guide. I don't
14 think I want to get too repetitive if the motherhood
15 Reg. Guide has it, if that makes sense to you.

16 CHAIRMAN SKILLMAN: I understand your
17 response, Frank, but I think what Dr. Shack is
18 pointing to is this kind of ill-at-easeness that we
19 have. Perhaps think about Recommendation 1 in the
20 Fukushima Report, where we have this morass of
21 documents that are kind of all over the place and the
22 need to really get highly focused on what we really
23 want.

24 And here is a case where we are talking
25 kind of a bedrock concept for operability of emergency

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1 core cooling, and we are saying, hey, for ECCS, for
2 NPSH, for P's and for B's, "Hey, Applicants, give the
3 NRC the staff they need 30, 60, 90 days ahead of time,
4 so they have a chance to digest it." That is all he
5 is saying.

6 MR. TALBOT: I have a thought. Under
7 documentation for this Reg. Guide, C.3, Documentation
8 for Testing, we could add something there about having
9 those procedures available 60 days prior to intended
10 use.

11 CHAIRMAN SKILLMAN: It is easy to do.

12 MR. TALBOT: It is an easy place to put
13 it.

14 CHAIRMAN SKILLMAN: The vehicle is here to
15 do it, and it addresses --

16 MR. TALBOT: That is the comment I am
17 thinking now I would make.

18 MEMBER SHACK: Because, again, we could
19 all argue about specificity. I mean, I understand
20 that you can't be specific about test procedures in
21 the general sense. But, certainly, I would like the
22 reassurance that the NRC will be able to look at these
23 in some detail. I would find that very comforting, to
24 have that directly stated in the document.

25 MEMBER SCHULTZ: And I understand, Frank,

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1 that you don't want to repeat things that are in other
2 guidance documents.

3 MR. TALBOT: Yes, that is one thing I was
4 trying to avoid --

5 MEMBER SCHULTZ: That is very important.

6 MR. TALBOT: -- for simplicity.

7 MEMBER SCHULTZ: But what you can do is
8 provide appropriate, a few appropriate hooks that are,
9 in fact, referenced back to whatever you would like to
10 call it, the mother document or the guidance document.

11 MR. TALBOT: I have taken that as my
12 second comment, that C.3 seems to me to be a desirable
13 place to put an item to say provide, the COL
14 applicants provide the procedures prior to intended
15 use 60 days, well, make available 60 days prior to
16 intended use, which they are supposed to make
17 available to NRC and staff.

18 CHAIRMAN SKILLMAN: Well, I think that
19 that set of words is already in the Design
20 Certification for at least one design, the U.S. ABWR,
21 but I suspect it is elsewhere.

22 MR. TALBOT: It is.

23 CHAIRMAN SKILLMAN: I think what Dr. Shack
24 is saying is --

25 MR. TALBOT: Well, 14.2, Section 14.2, of

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1 the initial test programs has that same requirement in
2 it, that the inspection procedures will be made
3 available to NRC inspectors 60 days --

4 CHAIRMAN SKILLMAN: Six months --

5 MR. TALBOT: -- prior to intended use.

6 There is also in DG-1259 a Section b,
7 which talks about the NRC inspection program for the
8 initial test program. And that same information is in
9 that part of DG-1259. Now my question to you, sir,
10 is, are you looking at Reg. Guide 1.68, Rev. 3, on the
11 publicly-available --

12 MEMBER SHACK: I am looking at Rev. 3.

13 MR. TALBOT: Okay. Because the new update
14 for DG-1259 includes these two Reg. Guide. Like, for
15 instance, in Reg. Guide 1.68, Rev 3., there is no
16 reference to Reg. Guide 1.79.1 because it is brand-
17 new. But you will find in DG-1259, Reg. Guide 1.68,
18 Rev. 4, I think the newer Reg. Guides are all in
19 there, including Reg. Guide 1.82 and the other Reg.
20 Guides that I am trying to get through the slides on.
21 But we can just continue right now.

22 I am on slide 6 right now. Do you want --

23 CHAIRMAN SKILLMAN: Let me check with my
24 colleagues here. Joy or Bill?

25 CONSULTANT WALLIS: I just want to follow

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1 up very --

2 CHAIRMAN SKILLMAN: Graham?

3 CONSULTANT WALLIS: -- briefly what the
4 Chairman said about specificity. I have about half a
5 dozen points of specificity, but I don't want to raise
6 them now -- I will just raise them later on -- where
7 you say verify something, and I want to be clear about
8 what you mean.

9 MR. TALBOT: Okay.

10 CHAIRMAN SKILLMAN: Good. Thank you.

11 MR. TALBOT: These I think I am going to
12 have to take back with me and address individually
13 because I may not have the right answer to you off of
14 the top of my head, obviously.

15 CHAIRMAN SKILLMAN: We understand that.

16 MR. TALBOT: But I will try my best.

17 CHAIRMAN SKILLMAN: Okay.

18 MR. TALBOT: Okay. The other Reg. Guide
19 is 1.205, Risk-Informed Performance Evaluation Fire
20 Protection for Existing Light Water Reactors. We
21 added guidance for testing of protective breakers to
22 prevent thermal overload of electrical motors.

23 And then, other prerequisite guidance that
24 was added, it was Lessons Learned from Air Entrainment
25 into ECCS. In the beginning of both Reg. Guides, we

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1 added, under C, a paragraph both for the PWRs and for
2 the BWRs minimizing the effects of non-condensable
3 gases in ECCS systems. And you will find that on page
4 3 of Reg. Guide 1.79. And for the other Reg. Guide,
5 you find the same kind of guidance also on page 3.

6 CONSULTANT WALLIS: I have a question
7 about that.

8 MR. TALBOT: Yes.

9 CONSULTANT WALLIS: Non-condensable gases,
10 you are talking about void volume, void transport,
11 pump coordinates. You seem to be thinking about air
12 or something like that.

13 MR. TALBOT: Yes.

14 CONSULTANT WALLIS: Now there have been
15 incidents actually of damage where combustible non-
16 condensable gases produce radiolytic conversion of
17 water to hydrogen and oxygen, have actually led to
18 combustion and damage. And yet, you say something at
19 all about those kinds of non-condensable gases. I
20 would think you would have to say something about
21 check the combustibility of these gases.

22 MR. TALBOT: In this particular example,
23 it was primarily for air.

24 CONSULTANT WALLIS: I know, but they are
25 non-condensable gases which combust.

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1 MR. TALBOT: In accident sequences,
2 obviously, you would have that situation with hydrogen
3 is generated during core melt. We are in initial test
4 programs --

5 CONSULTANT WALLIS: No, actually, for your
6 regular operation, there was the Swedish incident with
7 the BWR, regular operation, no core melt, no accident,
8 and it was just running, and then, pop, goes a pipe
9 that causes accumulated some combustible gases, which
10 were generated in the system itself. There is some
11 radiolytic --

12 MR. TALBOT: I will have to look at that.
13 You say that was a Swedish reactor?

14 CONSULTANT WALLIS: I think you should.
15 You should say something about it in this guide, I
16 would think. They should check for combustible non-
17 condensables.

18 MEMBER SHACK: Well, I had the question
19 here whether this whole evaluation was just for the
20 test or it was an evaluation of the way that the
21 system was set up to handle non-condensable gases. To
22 me, there is a distinction. I mean, if it is just for
23 the test, it is one thing. If it really an evaluation
24 of whether this system meets all the generic letter
25 requirements for avoiding collection of non-

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1 condensable and combustible gases in the system, it is
2 another.

3 MR. TALBOT: During the pre-op test phase,
4 I wouldn't be concerned about the hydrogen issue.
5 That is different for when you start out.

6 MEMBER SHACK: But when it says, "This
7 evaluation, "The evaluation should document the
8 rationale and determination that gas intrusion into
9 the ECCS system would not adversely affect the ability
10 of the system to perform its function." I look at
11 that as a general engineering statement. That should
12 include everything, non-condensable gases.

13 So, this evaluation is really meant to be
14 an evaluation of the whole ability of the system to
15 avoid gases in the system, I mean not just for the
16 test, because that is not quite so clear to me.

17 CONSULTANT WALLIS: That is what they say
18 on page 3, too, "Verify non-condensable gases are kept
19 to an acceptable level." It is a very general
20 statement.

21 MEMBER REMPE: Yes, what is "acceptable
22 level"?

23 CONSULTANT WALLIS: Yes.

24 MEMBER SHACK: Well, I can understand that
25 they don't want to deal with that within this Reg.

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1 Guide. I mean, that is a detailed discussion
2 somewhere else, but, again --

3 MR. TALBOT: That I would hope you would
4 find information in the DCD relative to what would be
5 an acceptable amount of gas permitted in DCD. And
6 also, this is for testing purposes. You want vent
7 valves. If you have them in the system to get the air
8 out, those are the kinds of things that we thought of
9 when we created that prerequisite.

10 MEMBER REMPE: Is there someplace that
11 guarantees --

12 MR. TALBOT: And also, this is a
13 prerequisite before testing. All right? Before you
14 begin the testing, you evaluate for air.

15 Now, as far as hydrogen, that is something
16 I didn't think of, because that seems to me to be an
17 engineering evaluation after you have had an accident
18 scenario of some sort.

19 MEMBER SHACK: Well, no, no, no,
20 operational.

21 MR. TALBOT: Yes, operational accident
22 scenario when you load fuel. I think this
23 prerequisite we were thinking was more along the lines
24 of when you do the pre-op testing.

25 MEMBER SHACK: Okay. This is just to make

1 sure that you are running a good pre-op test?

2 MR. TALBOT: Yes, that is what our
3 thinking was.

4 MEMBER SHACK: That is all it is for?
5 Okay.

6 MEMBER REMPE: And is there someplace that
7 "acceptable" is consistent from plant to plant? I
8 mean, there is an engineering evaluation they do that
9 you review, and somewhere is there a rule of thumb
10 that someone says, "Yes, that meets my acceptable
11 criteria."? And is that document in another Reg.
12 Guide somewhere or someplace?

13 MR. TALBOT: Well, you mean the licensee's
14 response to the evaluation?

15 MEMBER REMPE: Okay.

16 MR. TALBOT: I mean, you would look at an
17 evaluation that the licensee does.

18 MEMBER SHACK: Submits.

19 MR. TALBOT: And then make a determination
20 of if it meets NRC requirements where the gas would
21 not be a big problem when you conduct these ECCS
22 tests.

23 MEMBER REMPE: Right. And what I am
24 asking -- and again, maybe this is my ignorance in the
25 process -- but, okay, you review one evaluation, and

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1 then, two years from now, another plant comes in with
2 their evaluation. Is there general guidance that this
3 is acceptable? And where is that documented? I mean,
4 you have got a different staff member reviewing it
5 possibly. And how do you ensure consistency, that
6 what is acceptable today was acceptable two years ago,
7 is what I am asking you. Is that somewhere that is
8 documented?

9 MR. TALBOT: Kerri, do you want to feed
10 in?

11 MS. KAVANAGH: Again, this is Kerri
12 Kavanagh.

13 I would have to check, but I would imagine
14 that kind of acceptance criteria would be in the
15 Standard Review Plan for that section for the reviewer
16 to look at.

17 MEMBER REMPE: Okay.

18 MS. KAVANAGH: But I would have to verify
19 that for you.

20 MR. TALBOT: I would, too, yes.

21 MEMBER REMPE: There is a bunch of these
22 things where I see very vague terms, and what I am
23 asking for is consistency on all the "acceptables" and
24 different things I see throughout these documents.

25 MS. KAVANAGH: Right.

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1 MEMBER REMPE: And it could be my
2 ignorance.

3 MS. KAVANAGH: Well, no, that is not
4 generally our area of review.

5 MR. TALBOT: Yes.

6 MS. KAVANAGH: But we could check the SRP
7 for you to make sure that is covered.

8 MEMBER REMPE: I would be interested.
9 Thanks.

10 CONSULTANT WALLIS: Also, on this subject,
11 it seems to be all about gas intrusion, but gas gets
12 there by being created, hydrogen, oxygen, and others.
13 And it gets there by coming out of the solution.
14 Nitrogen can get dissolved. You pressurize things
15 with nitrogen if there is circulation and all that.
16 It can be left behind by maintenance, and so on. Does
17 intrusion cover all those possibilities or do you need
18 a different word?

19 MR. TALBOT: Our thinking was intrusion
20 from IRWST suction lines, it could get in that way.

21 CONSULTANT WALLIS: Yes, but --

22 MR. TALBOT: When vent valves are used,
23 you are just reminding the licensee that they need to
24 close them before they start the pump.

25 CONSULTANT WALLIS: I would be happy to

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1 have a statement which said that the licensee should
2 consider all sources of non-condensable gases, such as
3 blah, blah, blah, blah, blah, blah, and evaluation, or
4 something like that, rather than this emphasis on
5 intrusion.

6 MR. TALBOT: Okay. We will definitely
7 take a note of that.

8 MEMBER SHACK: But, again, I think it is
9 very different if you are looking at this as
10 describing only the pre-op test versus the way that
11 you deal with gases --

12 CONSULTANT WALLIS: Right. That is right.

13 MEMBER SHACK: -- in the whole operating
14 history of the plant.

15 CONSULTANT WALLIS: Yes. That is right.

16 CHAIRMAN SKILLMAN: Well, clearly, the
17 Reg. Guides are for pre-operational testing. We
18 understand that.

19 MR. TALBOT: Yes. This Reg. Guide is for
20 pre-operational tests only. So, the hydrogen issue,
21 I don't think it is a concern --

22 CONSULTANT WALLIS: They have to operate
23 for a while.

24 MR. TALBOT: -- for this Reg. Guide.

25 However, the other Reg. Guide, 1.79.1, some of those

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1 tests are done at power. Then, I think you have more
2 of an issue.

3 CONSULTANT WALLIS: So, you have got it
4 there. It is just pre-op. And do they ever use this
5 Reg. Guide if they have shut down for a while and then
6 they start up again or something?

7 MR. TALBOT: No, it is used only once in
8 the beginning of plant life.

9 CONSULTANT WALLIS: Only once?

10 MR. TALBOT: That is it.

11 CONSULTANT WALLIS: That clarifies a lot,
12 then. Thank you.

13 MR. TALBOT: I think when they do power
14 uprates, they do revisit some of the tests during the
15 initial assessment --

16 CHAIRMAN SKILLMAN: Some portions.

17 MR. TALBOT: Some portions, that is right.

18 MEMBER SHACK: Depending on what you have
19 changed in the plant.

20 CHAIRMAN SKILLMAN: Frank, please proceed.

21 MR. TALBOT: Okay. Where were we? Okay,
22 we got to the part --

23 CHAIRMAN SKILLMAN: Slide 7, I think you
24 were coming to the end.

25 MR. TALBOT: Okay. We did the

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1 prerequisites on air entrainment.

2 Reg. Guide C.2.c(2), on Lessons Learned
3 from ECCS Suction Standard Debris Issues.

4 CONSULTANT WALLIS: What is that? Can we
5 look at that?

6 MR. TALBOT: And pump failures.

7 CONSULTANT WALLIS: C.2.c(2), where is
8 that? It is difficult to know where you are with all
9 the subheadings.

10 MR. TALBOT: Yes, yes.

11 CONSULTANT WALLIS: How do I know when I
12 am on C? Because you have to go all the way back and
13 find out where C starts.

14 So, couldn't you repeat that it is Section
15 C or something, so we know where we are?

16 MR. TALBOT: Okay. Yes. This goes back
17 the component testing information.

18 CONSULTANT WALLIS: Oh, this is C. Now we
19 need C.2. We need to know when we are on 2.

20 MR. TALBOT: Yes. Every time you go to
21 C.2, you are in component testing.

22 CONSULTANT WALLIS: Well, where is C.2?
23 Where does it start? There are all these subheadings.

24 MS. KAVANAGH: Page 8.

25 CONSULTANT WALLIS: Eight?

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1 MR. TALBOT: Piping and Support, C.2.

2 CONSULTANT WALLIS: I don't have a "2" on
3 page 8.

4 MR. TALBOT: C.2, here it is. It is on
5 page 9. It starts with "Verify design acceptance
6 criteria met for NPSH performance under maximum system
7 flow pressure and temperature conditions." And then,
8 it goes on for about three or four more sentences.

9 CONSULTANT WALLIS: Wait a minute. We
10 have got C.2.c(2). Which are you talking about?

11 MR. TALBOT: Yes, on Reg. Guide 1.79, it
12 is on page 9.

13 CONSULTANT WALLIS: Okay.

14 MEMBER SHACK: It is near the bottom of
15 the page, the lower third.

16 MR. TALBOT: Yes, the lower third, C.2,
17 and then "(2)" in parentheses, c(2) in parentheses.
18 And that gets into some more specific guidance about
19 design and test acceptance criteria met for startup
20 test conditions.

21 CONSULTANT WALLIS: Talking on pump
22 failures? Where is it talking on pump failures? I
23 still haven't found it.

24 CHAIRMAN SKILLMAN: It is on page 9, about
25 three-quarters of the way from the top --

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1 MR. TALBOT: Yes, page 9. Yes.

2 CHAIRMAN SKILLMAN: -- on Reg. Guide 1.79.

3 MR. TALBOT: Yes, here let me help you.

4 CONSULTANT WALLIS: Where are we?

5 MR. TALBOT: I am going to pull it up for
6 you. I do have all the Reg. Guides. That is why I am
7 glad I gave you hard copies, too.

8 CONSULTANT WALLIS: Well, I still don't
9 find the -- I am still lost.

10 MR. TALBOT: I am going to find it for
11 you.

12 CONSULTANT WALLIS: I am still lost.
13 Well, I am on the wrong one. Okay. So, I am on the
14 wrong on.

15 MEMBER SHACK: That will solve the
16 problem.

17 CONSULTANT WALLIS: Not clogged with
18 debris? Oh, that is what we talked about already.

19 MR. TALBOT: Yes.

20 CONSULTANT WALLIS: Okay. I thought that
21 was not a helpful statement. I have said my bit on
22 that already. That is all right. We have covered
23 that.

24 CHAIRMAN SKILLMAN: Okay, Graham, are you
25 comfortable?

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1 MR. TALBOT: Can you see it?

2 CHAIRMAN SKILLMAN: That is it right
3 there. There you go.

4 CONSULTANT WALLIS: It doesn't say
5 anything about guidance on lessons learned from debris
6 issues. It doesn't contain guidance on lessons
7 learned. It simply says you have got to check that
8 the strainer isn't clogged, which doesn't say anything
9 to me. So, let's leave that one.

10 MR. TALBOT: So, the comment is C.2 should
11 add more information about lessons learned?

12 CONSULTANT WALLIS: What do you mean by
13 "Check it is not clogged with debris?" We have been
14 over that, though. We don't need to do it again.

15 Can we look at the third item on slide 7?
16 It talked about piping system and supports. Let's
17 look at something specific.

18 CHAIRMAN SKILLMAN: And what is your
19 question there, Graham?

20 CONSULTANT WALLIS: Well, I am just trying
21 to get a specific thing from a document, make sure we
22 are on the same page --

23 CHAIRMAN SKILLMAN: Because on page 10 --

24 CONSULTANT WALLIS: -- on the right
25 document. Okay.

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1 CHAIRMAN SKILLMAN: This is the middle of
2 page 10.

3 CONSULTANT WALLIS: Oh, I am on, let's
4 see, so if I go to 1.79.1, simply because I have got
5 that --

6 MR. TALBOT: Yes, system piping and
7 supports is C.2.f.

8 CONSULTANT WALLIS: But several times in
9 these documents it says, "Verify" -- I am now on page
10 5 of 1.79.1 at the very top -- "Verify acceptable
11 system piping movement." This occurs several times in
12 these guides. What do you want? Do you want them to
13 have sensors on every pipe in the plant to see how
14 much it moved? Is this a walkdown afterwards to see
15 if there is some gross movement? What do you mean by
16 "Verify system piping movement."? There is piping
17 movement very often during transients and during
18 tests.

19 MR. TALBOT: Yes.

20 CONSULTANT WALLIS: What do you mean by
21 "Verify acceptable"? Is that supposed to be a
22 measurement of how much it moved? Is it supposed to
23 be a walkdown afterwards to see if something broke?
24 What is it? How do you verify --

25 MR. TALBOT: You are referring to Reg.

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1 Guide 1.79.1, page --

2 CONSULTANT WALLIS: Well, both of them.

3 Both of them have the same thing.

4 CHAIRMAN SKILLMAN: He is on page 5 at the
5 top of the page on Reg. Guide 1.79.

6 CONSULTANT WALLIS: That is just one place
7 where it says "verify".

8 MR. TALBOT: "Verify acceptable pump and
9 motor vibration levels and system piping during
10 steady-state and transient operation."

11 CONSULTANT WALLIS: What do you want them
12 to do?

13 MR. TALBOT: "The test may also be
14 performed with the expansion vibration and dynamics
15 effects pre-operational test."

16 CONSULTANT WALLIS: What do you want them
17 to do.

18 MR. TALBOT: Now, with respect to that
19 one, one of the other Reg. Guides, 1.20, handles
20 vibration testing. We have been striving to provide
21 fairly high-level guidance where a lot of times other
22 Reg. Guides have --

23 CONSULTANT WALLIS: Can you cite something
24 there?

25 MEMBER SHACK: Well, in 1.79 you cite the

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1 ASME section.

2 MR. TALBOT: Yes.

3 MEMBER SHACK: And so, to me, it is very
4 specific in 1.79.

5 CONSULTANT WALLIS: Oh, it is. What page
6 is that on?

7 MEMBER SHACK: It is on page -- what page
8 is that? Page 10.

9 MR. TALBOT: For 1.79, page 10, System
10 Piping and Supports". It does say, "Verify the design
11 acceptance criteria met persistent piping movements
12 under system startup conditions and during steady-
13 state operations. The ASME Boiling and Pressure
14 Vessel Code, Section 3, Design Considerations," and it
15 cites --

16 CONSULTANT WALLIS: Well, that is good.

17 MR. TALBOT: It cites NB, NC, ND 3622.3
18 for vibration.

19 CONSULTANT WALLIS: That is vibration.

20 MR. TALBOT: And that is Reference 8. It
21 "provides a robust methodology for testing,
22 monitoring, evaluating, and controlling piping system
23 vibration."

24 CONSULTANT WALLIS: That is vibration.

25 That is not actual motion. That is not actual

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1 displacement of the pipe, is it?

2 MR. TALBOT: Yes, this is, again, a case
3 where we tried, and this is, I think, where the ACRS
4 is probably having difficult a little bit, is the
5 system-level are higher-level and the component-level
6 descriptions get into more specificity.

7 CONSULTANT WALLIS: Well, let's go to
8 another thing now on 1.79.1. It is the same issue
9 really.

10 CHAIRMAN SKILLMAN: Graham, let me just
11 stop for a second.

12 Let the record show that Michael Ryan has
13 joined us, please. Thank you.

14 Go ahead, Graham.

15 CONSULTANT WALLIS: Okay. 1.79.1, page 4,
16 it is f(4), says, "Verify that water hammer does not
17 occur." How are you going to do that? Is it just
18 that someone in the control room heard a bang and
19 said, "Gee whiz, there must be water hammer."? How do
20 you know that water hammer occurred or didn't?

21 MR. TALBOT: We will take that one
22 under --

23 CONSULTANT WALLIS: If you damage a pipe,
24 then you may know it if you actually find the damaged
25 pipe.

1 MR. TALBOT: Uh-huh.

2 CONSULTANT WALLIS: But how do you know?

3 It is not an easy thing.

4 CHAIRMAN SKILLMAN: Frank, I am wondering
5 if maybe there isn't an issue here that is worthy of
6 staff's attention. And that is, for every pointer to
7 wording that is "verify criteria" or "verify
8 acceptance," whatever it might be, if there shouldn't
9 be a pointer either to the appropriate subsequent
10 paragraph that has the higher-level specificity or a
11 pointer to the appropriate portion of Reg. Guide 1800,
12 the Standard Review Plan, that provides the answer to
13 the question that Dr. Wallis is pointing to.

14 It is the vagueness that is driving these
15 questions. I don't think that there is a sense around
16 the table that this document doesn't attempt to focus
17 on the right things. What is absent is, once focusing
18 on the right things, how do you know that the outcome
19 is what you want the outcome to be? And that is the
20 answer that isn't being pointed to.

21 So, might there be a way to weave the
22 right hooks into these two Reg. Guides, so that when
23 one says, "Verify" thus and so, it is really verifying
24 in accordance with either ASME or Reg. Guide 1800, or
25 whatever the standard might be?

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1 MR. TALBOT: Are you referring to, when
2 you say Reg. Guide, you are talking about NUREG-1800,
3 Standard Review Plan, correct?

4 CHAIRMAN SKILLMAN: Yes. Yes.

5 MR. TALBOT: That is what I think you
6 want.

7 CHAIRMAN SKILLMAN: Yes.

8 MR. TALBOT: And that is what we can
9 provide. I think that is absolutely necessary to
10 improve the quality of what kind of guidance this
11 document needs to be --

12 CHAIRMAN SKILLMAN: Well, it would have
13 answered every question that Dr. Wallis --

14 MR. TALBOT: Yes

15 CONSULTANT WALLIS: I think this is a very
16 difficult one.

17 MR. TALBOT: And we do have, I think, in
18 the motherhood Reg. Guide, DG-1259 I think does refer
19 to the Standard Review Plan, but it is obviously quite
20 necessary for this Reg. Guide to have the specific
21 NUREG-0800 Standard Review Plan sections for ECCS.
22 That will help you get there.

23 CONSULTANT WALLIS: No, but, look, when
24 you inject cold water into a hot system with steam in
25 it, you are going to get condensation, rapid

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1 condensation. You will get some bangs. Is that water
2 hammer? How do you verify water hammer didn't occur?
3 I don't see how you can do it. It is like trying to
4 verify zero. I don't see how -- you are asking them
5 to do the impossible.

6 MR. TALBOT: I will have to go through the
7 NUREG-0800 Standard Review Plan and look for specific
8 items that are related to the water hammer issue and
9 how licensees are required to address it. Would that
10 be acceptable?

11 CONSULTANT WALLIS: Yes. Maybe. Maybe,
12 if you find the right thing.

13 MR. TALBOT: Right, right. I may have to
14 actually pull the words out of there and stick it in
15 this Reg. Guide. But we can provide that.

16 CHAIRMAN SKILLMAN: I can understand the
17 reluctance to grow these documents into encyclopedias.

18 MR. TALBOT: Yes.

19 CHAIRMAN SKILLMAN: But, at the same time,
20 the issue that we are dealing with is so important
21 that these types of questions that linger simply
22 detract from the usefulness of the Reg. Guide and what
23 it is you are really to accomplish.

24 MR. TALBOT: Right. Agreed. Agreed.

25 MEMBER SHACK: Well, I think we are asking

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1 perhaps a bit too much here. I mean, you know,
2 "Verify proper operation of system software-based I&C.
3 Check system functional performance." You can't get
4 much more specific than that without having a huge
5 plan. I mean, you know, it is verified what was sort
6 of set up in the design works, but you can't
7 incorporate all that into this document. That is why
8 it is important, I think, clearly to understand the
9 guy is going to have to come up detailed plans. The
10 NRC should have a chance to review them, but I think
11 you are just not going to find all that in this
12 document.

13 CHAIRMAN SKILLMAN: But I think what could
14 be provided is wording that says, "Verify that the
15 functional performance requirements" for that portion
16 of the control system or the power system, or whatever
17 it might be, meet the design requirements.

18 MR. TALBOT: That is one thing we always
19 struggle with 14.2, initial --

20 CHAIRMAN SKILLMAN: And those words are
21 absent. That is really the set of words that we are
22 looking for. "Verify that the functional performance
23 requirements are met."

24 MEMBER SHACK: Well, you know, is "proper
25 operation" a code word for that? Sometimes they do.

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1 In the particular one for the software, you know, as
2 specified in design specifications. Other times, they
3 do just draw back to the proper operation of system
4 valves.

5 CHAIRMAN SKILLMAN: Well, you know, it
6 could be as simple as saying, "Push the button and
7 make sure it runs." There needs to be a whole lot
8 more than that, at least in my view. The functional
9 performance requirements for the particular operating
10 mode need to be proven. And that is what you are
11 trying to do here.

12 So, I think that there is some word
13 engineering that is very important that is not overly
14 specific, but that is also not overly general. And
15 that balance I think is absent right now, Frank.

16 MR. TALBOT: Uh-hum. In some cases, I
17 have the specificity, but in others I do not.

18 CHAIRMAN SKILLMAN: That is accurate.

19 MR. TALBOT: Okay.

20 CONSULTANT WALLIS: Can we go back to page
21 2? Sort of a high-level comment that surprised me --

22 MEMBER REMPE: Which document?

23 CONSULTANT WALLIS: Well, I am on 1.79.1.
24 I think it is also in 1.79 in a similar place.

25 MR. TALBOT: Page 2?

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1 CONSULTANT WALLIS: Yes. It says, "The
2 NRC issues RGs to describe to the public methods that
3 the staff considered acceptable for use in
4 implementing parts of the agency's regulations," blah,
5 blah, blah, blah. And then, later on, you find,
6 "and to provide guidance to applicants and licensees".
7 The public is the first. It is the licensees and
8 applicants sort of come later, almost as a sort of
9 subsidiary or subordinate or something. I am
10 surprised that the purpose of the RGs is for the
11 public. Is it really?

12 MR. TALBOT: Could you repeat that
13 question one more time?

14 MS. KAVANAGH: Frank, I have got this one.
15 I am sorry. There is standard language
16 that --

17 CONSULTANT WALLIS: I know it is standard
18 language. It is very surprising to me.

19 MS. KAVANAGH: And Frank and I are not in
20 the position to answer the standard language.

21 CONSULTANT WALLIS: Oh, okay.

22 MS. KAVANAGH: That is dictated by the
23 Office of Research.

24 MR. TALBOT: That is true.

25 CONSULTANT WALLIS: If you really want to

1 describe something to the public, would you do it this
2 way? Anyway, I am surprised, but I guess it is not
3 for this meeting.

4 MS. KAVANAGH: Right. There is standard
5 language that is used in all Regulatory Guides, and we
6 are not the proper people to address that kind of
7 thing.

8 CONSULTANT WALLIS: Okay.

9 MR. TALBOT: Yes, the generic guidance,
10 Tom Boyce is the Branch Chief over in Research.

11 CONSULTANT WALLIS: Okay.

12 MR. TALBOT: And for standard language
13 that is in like the last paragraph, it is the same
14 thing.

15 CONSULTANT WALLIS: Well, do you think it
16 is for the public?

17 MR. TALBOT: Huh?

18 CONSULTANT WALLIS: Do you think this
19 document is for the public?

20 CONSULTANT BONACA: Well, it says,
21 "Provide guidance for applicants and licensees."

22 CONSULTANT WALLIS: That is later on.
23 That is later on.

24 Maybe it is an unfair question, but do you
25 think the prime purpose of this is for the public?

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1 MEMBER SHACK: It depends on how general
2 your definition of the public is.

3 CONSULTANT WALLIS: Well, I will stop.

4 MEMBER SHACK: We are part of the public.

5 CONSULTANT WALLIS: That is right.

6 MR. TALBOT: Stakeholders are part of the
7 public.

8 CONSULTANT WALLIS: Is it addressed to me,
9 this document?

10 MEMBER SHACK: Yes, well --

11 CONSULTANT WALLIS: Okay. Good. So, I
12 will pay more attention.

13 MEMBER SHACK: It is useful for me to
14 understand how the NRC regulates.

15 CONSULTANT WALLIS: Okay. Let's drop
16 that.

17 CHAIRMAN SKILLMAN: Frank, let's proceed.

18 MR. TALBOT: Okay. Slide 8, the summary
19 of public comments on DG-1253, we did provide those to
20 you. We got six public comments, and they actually
21 turned out to the NRC staff. They didn't come until
22 later on, because initially I got no public comments,
23 which I was surprised, on DG-1253.

24 When we issued DG-1277, we got 44 public
25 comments. Six of them were generic public comments

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1 related to DG-1253, which is Reg. Guide 1.79, Revision
2 2. Most of the comments related to testing of valves,
3 which we discussed earlier. And you have those. I
4 gave you the public comments.

5 And the public comments, basically, were
6 related to testing of valves and got into quite a bit
7 of specificity on how the valves should be tested. I
8 think, as a matter of fact, all of it was related to
9 valves, even got into specificity on how you test
10 squib valves, which is in the AP1000 slide.

11 And then, the other comment was related to
12 valve testing, component testing for valves, and there
13 were some revisions to documentation that were made.

14 And again, this gets into the specificity
15 of public comments on DG-1277. Again, there were 44
16 public comments. Most of the comments came from
17 General Electric Hitachi on Reg. Guide 1.79.1. And
18 those comments from GEH were reviewed. A majority of
19 their comments were accepted.

20 The big-picture items were we did have a
21 lot of guidance related to testing all BWRs, but GEH
22 had informed us, "We are not going to build any more
23 BWR 2's through 6's. We are just going to concentrate
24 on the design certifications and the licensing of the
25 ABWR and the ESBWR."

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1 So, they had recommended maybe you should
2 pull out the stuff on plants that have already gone
3 through the BWR 2 through 6 testing. Initial test
4 programs are already over.

5 So, I revised the Reg. Guide to delete all
6 the generic information related to the older BWRs and
7 just concentrated on the ABWR and the ESBWR, and made
8 sure the design information was correct. So, that was
9 the major change that we did for Reg. Guide 1.79.1.

10 And then, slide 10, we have got new
11 passive and active ECCS systems in existence and new
12 PWR and BWR plants licensed under Part 52. So, we
13 have the ECCS test described now at the system level,
14 and we do address ECCS air entrainment, ECCS debris
15 sources, vibration testing to meet the Section 3 code,
16 and ECCS components testing has been upgraded.

17 CONSULTANT WALLIS: Yes, and you have got
18 ECCS debris sources. I didn't see any particular
19 reference in here to --

20 MR. TALBOT: The specificity is lacking.

21 CONSULTANT WALLIS: -- sources of debris.

22 MR. TALBOT: Yes, but that was one of your
23 comments earlier.

24 CONSULTANT WALLIS: Yes. That was, was
25 there any on the strainer, but there was nothing about

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1 is there dirt in the suppression pool --

2 MR. TALBOT: Right.

3 CONSULTANT WALLIS: -- or something like
4 that.

5 MR. TALBOT: Or containment wall paint
6 that is falling off and getting into the sumps.

7 CONSULTANT WALLIS: So, you haven't really
8 addressed the question of debris sources.

9 MR. TALBOT: And on the debris source
10 issue, we could look into -- I believe there are other
11 guidance out there also.

12 CONSULTANT WALLIS: Yes.

13 MR. TALBOT: It is like you said,
14 NUREG-0800, the Standard Review Plan, we can check
15 that, too.

16 MEMBER SHACK: But, again, you are going
17 to have debris sources. You can talk about latent
18 debris, but you are not going to have any accident-
19 generated debris in this test.

20 CONSULTANT WALLIS: That is right. That
21 is right.

22 MEMBER SHACK: That is for sure.

23 MR. TALBOT: And we are talking about a
24 new plant, too. So, you shouldn't have --

25 CONSULTANT WALLIS: There shouldn't be

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1 much --

2 MEMBER SHACK: I just look at this as sort
3 of a garbage cleanup kind of thing. This is not
4 really related to GSI-191 kind of concerns.

5 CONSULTANT WALLIS: You are in real
6 trouble if you have got clogged strainers with a --

7 MEMBER SHACK: With a brand-new plant and
8 then no accident --

9 CONSULTANT BONACA: Can I ask a question
10 on the section of recirculating test cold conditions?

11 You have page 5(b). "Testing should
12 verify that the available NPSH is greater than that
13 required for the pumps to achieve the design
14 function."

15 MR. TALBOT: Page 5 of which Reg. Guide?

16 CONSULTANT BONACA: Of 1.91. Or 1.79.

17 I'm sorry. Page 5.

18 CHAIRMAN SKILLMAN: And, Mario, where are
19 you on that page 5, please?

20 CONSULTANT BONACA: Right in the middle
21 that says Section C.2.b.

22 CHAIRMAN SKILLMAN: Thank you. C.2.b.
23 Okay.

24 CONSULTANT BONACA: "Testing should verify
25 that the available Net Positive Suction Head is

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1 greater than that required for the pumps to achieve
2 their design function."

3 Now, you know, we had a long history of
4 this. I was curious to note that we mean -- well, we
5 have wrestled with the issue of capitation.

6 MR. TALBOT: I am sorry, I couldn't hear
7 you.

8 CONSULTANT WALLIS: This is all about the
9 RCIC system, isn't it?

10 CONSULTANT BONACA: Yes, right.

11 CHAIRMAN SKILLMAN: Well, no, he is on
12 1.79 --

13 MR. TALBOT: Yes, 1.79 is for PWRs.

14 CHAIRMAN SKILLMAN: -- page 5. So, he is
15 on PWR suction on this particular question.

16 CONSULTANT WALLIS: Oh, yes, okay, the
17 same thing with that, yes.

18 MR. TALBOT: If you want to refer to the
19 RCIC guidance, I would think you would have something
20 similar for RCIC under --

21 CONSULTANT WALLIS: Yes, we do have
22 something similar for RCIC.

23 MEMBER SHACK: You do.

24 CONSULTANT WALLIS: Right. It is very
25 similar I think.

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1 MEMBER SHACK: Well, it is high-pressure
2 core flooder.

3 MR. TALBOT: Yes, low-pressure flow tests.
4 RCIC is C.1.c --

5 CONSULTANT WALLIS: It is also on P.1.c,
6 yes.

7 MR. TALBOT: -- on page 6.

8 There is roughly over two pages for RCIC.
9 However, there is no reference like there is to the
10 other regulatory position, C.2.c(2), which talks about
11 the debris issue in more specificity, at least for
12 Reg. Guide 1.79.1.

13 CHAIRMAN SKILLMAN: So, Mario, did you --

14 CONSULTANT BONACA: What I was asking
15 these guys, I wanted to know if, for these new plants,
16 clearly, I am going to expect that there should be
17 granting by pressure.

18 MR. TALBOT: I am having a hard time
19 hearing.

20 MEMBER SHACK: Beyond the vapor pressure
21 that they are allowed, so it doesn't flash.

22 CONSULTANT BONACA: Right. The question
23 I have is, is that the possibility of venting created
24 by pressure going to be denied for these plants or is
25 it a possibility?

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1 MS. KAVANAGH: No, all that calculation
2 work would be done during the licensing review. This
3 is just to make sure that the pump is getting adequate
4 head as designed. This is not relying pressure in the
5 containment. That would be done during licensing, and
6 new calculations submitted to support the licensing
7 action. This is to make sure that the testing of the
8 pump as designed and as licensed meets those licensing
9 requirements.

10 CONSULTANT BONACA: Okay.

11 MS. KAVANAGH: So, you would not be
12 granting any containment overpressure of that nature
13 during a pre-op test.

14 CONSULTANT BONACA: So, you are not taking
15 any credit for capitation, for example?

16 MS. KAVANAGH: You shouldn't. You should
17 be testing the pump facility as designed in your
18 licensing basis.

19 CONSULTANT BONACA: Okay. Because when I
20 look at the words "designing function," I don't see
21 that pumping capitation would be part of a design
22 criteria.

23 MS. KAVANAGH: Well, we would have to go
24 back to how it was licensed. I mean, this is just the
25 actual testing of the pump once it is built.

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1 CONSULTANT BONACA: Okay.

2 MS. KAVANAGH: We would have to go back
3 and see how the facility was licensed.

4 CONSULTANT BONACA: All right. Thank you.

5 CONSULTANT WALLIS: Well, it is important
6 for this RCIC system because the pump is above the
7 suppression pool in figure A-5. I guess we can get to
8 these appendices later because I have some points on
9 these appendices here.

10 CHAIRMAN SKILLMAN: What I would like to
11 suggest is that we continue here for another 20 or 30
12 minutes before a break and allow Graham, Mario, and
13 myself, and Steve and Bill and Joy, if they have any
14 specific comments.

15 What I am hearing is there are comments on
16 the changes. Members have comments on the changes,
17 but members also have comments on the document
18 portions that were not changed. And I would like to
19 allow the team --

20 MR. TALBOT: Just go one-by-one through
21 them in the next meeting --

22 CHAIRMAN SKILLMAN: -- to express their
23 concern and see where that leads us.

24 MR. TALBOT: I would like to get a sheet
25 of paper and write down every single one or a

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1 notebook.

2 MEMBER RYAN: We will have the transcript.

3 MR. TALBOT: Huh?

4 MEMBER RYAN: We will have the transcript.

5 MR. TALBOT: Okay.

6 CHAIRMAN SKILLMAN: So, let's continue
7 until you are ready to say, "I have completed the
8 presentation I intended to complete."

9 (Laughter.)

10 MR. TALBOT: Well, I was going to complete
11 right here for questions. There were some background
12 slides just on development of the Reg. Guides. You
13 can read those. They are later slides 11 through 16.

14 CHAIRMAN SKILLMAN: Okay.

15 MR. TALBOT: They don't provide any
16 information other than the historical --

17 CHAIRMAN SKILLMAN: Background of this.

18 MR. TALBOT: -- background for creating
19 these Reg. Guides. And that was one of Kerri's staff
20 that informed me that I should put that in the
21 background, because I wanted to get right to the heart
22 of the matter. Because the purpose of this meeting is
23 to get ACRS's comments and make sure we address your
24 issues.

25 CHAIRMAN SKILLMAN: Okay. Then, let's --

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1 MR. TALBOT: I would say I am done right
2 now. The rest is just for additional reading
3 material.

4 CHAIRMAN SKILLMAN: Okay.

5 MR. TALBOT: And then, we can go comment-
6 by-comment and make sure that we address all of the
7 ACRS concerns with these Reg. Guides to make them
8 usable for the new plants.

9 CHAIRMAN SKILLMAN: Okay. Zena?

10 MS. ABDULLAHI: Yes, there was a point
11 that people commended, and it may be helpful that he
12 said he could go -- "he" meaning Frank -- he could go
13 through the Reg. Guide and then go to sections and
14 just say, "Any comments here?" And then, we will take
15 notes.

16 MR. TALBOT: Yes.

17 MS. ABDULLAHI: So, that would be a much
18 more direct way instead of jumping around.

19 MR. TALBOT: It is a direct way for me to
20 document, make sure I capture every single one of your
21 questions. Then, I can go back and make the changes.

22 And then, the only other thing I would
23 want to ask is I think we did link GEH through
24 conference call, if you desire to talk to them. That
25 is up to you.

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1 MS. ABDULLAHI: I have to update you, in
2 that nobody joined.

3 MR. TALBOT: Okay.

4 MS. ABDULLAHI: And we don't understand
5 why.

6 MR. TALBOT: Okay. That is fine. We gave
7 them the number; they could have called in.

8 CHAIRMAN SKILLMAN: Okay. Then, let's do
9 this.

10 MR. TALBOT: Because they did give me 38
11 comments.

12 CHAIRMAN SKILLMAN: Let's get Reg. Guide
13 1.79 up there and let's start through.

14 Members, if members have comments, fire
15 away as we go through the pages. There are six or
16 eight pages per. There is a lot of boilerplate on
17 each of these Reg. Guides. But let's just go through
18 one at a time and give the members a chance to ask
19 questions that they may have. Okay?

20 MR. TALBOT: That sounds good to me.

21 CHAIRMAN SKILLMAN: And that way, you can
22 catch them in the order that the document is presently
23 structured.

24 Okay, let's just take a look at this page.
25 We are on page 1 of Rev. 2 of this Reg. Guide.

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1 MR. TALBOT: Okay.

2 CHAIRMAN SKILLMAN: Members, any comments
3 on that page?

4 (No response.)

5 No?

6 Okay. Next page, please.

7 MEMBER REMPE: I guess --

8 CHAIRMAN SKILLMAN: Joy, go ahead.

9 MEMBER REMPE: -- this is a little off-
10 the-wall, but, again, I am trying to understand the
11 process. But these are new plant designs. If
12 something occurs where a vendor says, you know, "This
13 isn't going to work with this design," what is the
14 process? This is just a Reg. Guide.

15 MR. TALBOT: Right.

16 MEMBER REMPE: So, maybe you would say,
17 "Well, we deem this test unnecessary because...."

18 MR. TALBOT: Because it is not in our
19 plant design. Right. Is that what you are thinking?

20 MEMBER REMPE: Or something they thought
21 maybe when they did the design certification they
22 could do, but, for some reason, they have learned
23 since then this is not going to happen. And the staff
24 agrees. What is the process to change what was agreed
25 upon in the design certification, is what I am asking.

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1 And has that occurred?

2 MR. TALBOT: Can I read a sentence to you?
3 On page 2 -- and this is not on page 1 -- there is one
4 sentence that addresses your issue. "Where an SSC is
5 not part of the specific nuclear plant design, the
6 associated testing would not apply."

7 MEMBER REMPE: Which?

8 MR. TALBOT: Page 2, the first paragraph.

9 MEMBER REMPE: I am on page 2.

10 MR. TALBOT: The first paragraph, the last
11 sentence.

12 "Where an SSC is not part of the specific
13 nuclear plant design, the associated testing would not
14 apply."

15 MEMBER REMPE: But, okay, that is if it is
16 not part of the plant design, but say it is part of
17 the plant design, but when people envisioned that the
18 test would occur for a particular component, they were
19 incorrect in their thoughts. And now, the vendor and
20 the utility, and even the staff, says, "Yes, we can't
21 do that." And maybe they will come up with a
22 different test or something, or whatever. But what
23 happens? Do you actually change the design
24 certification --

25 MS. KAVANAGH: No.

1 MEMBER REMPE: -- or does it come back to
2 the staff? Or what is the process?

3 MS. KAVANAGH: It is a license amendment.

4 MEMBER REMPE: It is a license amendment
5 request?

6 MS. KAVANAGH: Uh-hum.

7 MEMBER REMPE: Okay.

8 MEMBER SHACK: Unless you want to actually
9 change the design.

10 MEMBER REMPE: No, it is just that maybe
11 they think something is possible to --

12 MR. TALBOT: Do you believe that we should
13 add something related to license amendments?

14 MEMBER REMPE: No, I am not that wise. I
15 am just trying to understand what the process is.
16 Someone has raised this issue with a particular design
17 that they just were talking to me one day about it,
18 and they don't think it is possible to do the design.
19 And I was reading this; I was just wondering what the
20 process would be.

21 CHAIRMAN SKILLMAN: Yes, I think if it is
22 an RCOL, it is probably a license change. If it is an
23 SCOL, a Substantive COL, it becomes a departure.

24 MEMBER REMPE: Right.

25 CHAIRMAN SKILLMAN: And so, there is a

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1 process --

2 MS. KAVANAGH: Well, it depends on when
3 the question is raised.

4 CHAIRMAN SKILLMAN: Exactly. Exactly.

5 MEMBER REMPE: Yes, but if you have
6 already built the plant, you are getting ready to do
7 your pre-op, and they say, "Oh, well, I don't think we
8 could do that." Okay.

9 CHAIRMAN SKILLMAN: That is processed
10 through a negotiated discussion --

11 MEMBER REMPE: Right.

12 CHAIRMAN SKILLMAN: -- with the NRC and
13 with will be the licensee of that unit that has that
14 change.

15 MEMBER REMPE: Okay.

16 CHAIRMAN SKILLMAN: Okay. We are on page
17 2, folks. Any comments? Graham? Mario? Steve?
18 Bill? Joy? I have none on page 2.

19 MR. TALBOT: I am trying to set up this
20 document, so I can add your comments as I go.

21 MEMBER SHACK: Don't try to be too fancy.

22 MR. TALBOT: What I am going to do is,
23 each time you have a comment, hey, I am just going to
24 start typing. I just ask that you speak loudly, so
25 that I can hear the comment accurately and then

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1 provide it in the Reg. Guide.

2 CHAIRMAN SKILLMAN: Okay.

3 MR. TALBOT: Is that helpful?

4 MEMBER SHACK: Well, listen first, and
5 then you might not want to write it.

6 (Laughter.)

7 CHAIRMAN SKILLMAN: Yes, don't write until
8 we agree that something needs to be written.

9 MR. TALBOT: Okay.

10 CHAIRMAN SKILLMAN: Okay? Okay. I hear
11 no comments on page 2. Let's go to page 3.

12 CONSULTANT WALLIS: Well, here we have the
13 question about Reg. Guide 1.82. I think it would be
14 useful if you said something about specific items
15 where you did rely on that for acceptance criteria, or
16 something like that. Are you going to do that when
17 you talk about clogging later on or something?

18 Can you be more specific about how this
19 supports this guide, this other guide supports this
20 guide, and give an example or something?

21 Later on, we will try to talk about
22 clogging.

23 MR. TALBOT: More specific to the guidance
24 in Reg. Guide 1.82 test acceptance criteria?

25 CONSULTANT WALLIS: What have you used it

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1 for? It says it supports it, but I don't see anywhere
2 in the guide where it did support it.

3 CHAIRMAN SKILLMAN: Please confirm how it
4 is supported.

5 CONSULTANT WALLIS: Did it support your
6 evaluation of the strainer clogging or something?
7 What does it do?

8 CHAIRMAN SKILLMAN: Or please describe how
9 this is supported.

10 CONSULTANT WALLIS: Yes. You can work
11 that out when you look at the rest of the guides. If
12 it is not supporting it at all, maybe you just need to
13 say something else, say it differently.

14 What specific test acceptance criteria are
15 supported for the regulatory positions in this guide?

16 MR. TALBOT: Please describe how Reg.
17 Guide 1.82 --

18 CONSULTANT WALLIS: Supports test
19 acceptance criteria for the regulatory positions in
20 this guide, which is what you said here.

21 MR. TALBOT: Okay.

22 CHAIRMAN SKILLMAN: Graham, thank you.

23 Any other comments on page 3?

24 CONSULTANT WALLIS: Well, we talked about
25 non-condensable gases.

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1 MEMBER REMPE: And what is an acceptable
2 level? A couple of paragraphs down.

3 I am sorry to interrupt, but yes.

4 Where do you go to to see what an
5 acceptable level is?

6 CHAIRMAN SKILLMAN: So, what is the
7 acceptable level? What is acceptable level?

8 MEMBER REMPE: Which document --

9 CHAIRMAN SKILLMAN: Yes.

10 MEMBER REMPE: -- do you point to?

11 CHAIRMAN SKILLMAN: Yes. What is, quote,
12 acceptable level"?

13 MEMBER SHACK: See, I would argue that
14 that a design-specific thing. I mean, that depends on
15 your pump, your pump acceptance of error.

16 CONSULTANT WALLIS: Analyze it.

17 MEMBER SHACK: I think it is very
18 difficult. That really comes back --

19 CHAIRMAN SKILLMAN: There is probably a
20 paragraph in NUREG-0800 that describes that.

21 MEMBER REMPE: And I bet that is what they
22 told me, that it was in the Standard Review Plan.

23 CHAIRMAN SKILLMAN: What is acceptable?
24 They can tell you many things.

25 (Laughter.)

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1 MEMBER REMPE: Where do you find those?

2 CHAIRMAN SKILLMAN: Good, Frank, I think
3 you got it.

4 MR. TALBOT: Okay. Does that look good?

5 CHAIRMAN SKILLMAN: That is fine, yes. It
6 is probably making you spell "condensable" with an
7 "i".

8 MR. TALBOT: Yes, I need a hyphen in
9 there.

10 CHAIRMAN SKILLMAN: Yes.

11 MR. TALBOT: But that is not a big deal.

12 CHAIRMAN SKILLMAN: Okay.

13 MR. TALBOT: It reflects the right
14 message.

15 CHAIRMAN SKILLMAN: Yes.

16 Colleagues, any other comments on page 3?

17 CONSULTANT WALLIS: Later down, later in
18 that paragraph, it says, "Evaluation to document the
19 rationale in determining the gas intrusion into the
20 ECCS system would not reverse the effect."

21 MR. TALBOT: Oh, yes, I remember that.
22 That is the one of gases or --

23 CONSULTANT WALLIS: I think we need to
24 talk about all sources of gases or something. Now you
25 can figure out how to do that.

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1 But you should evaluate the sources of gas
2 from all processes, and then document that they don't
3 affect the ECCS system.

4 CHAIRMAN SKILLMAN: Okay, Graham, thank
5 you.

6 All right. Any other comments on page --

7 CONSULTANT WALLIS: I think the
8 flammability issue is not an issue. If I wrote it, I
9 would say that flammability is not an issue because
10 the plant hasn't run yet, or something.

11 MR. TALBOT: Yes, yes.

12 CONSULTANT WALLIS: Explain why it is not
13 an issue.

14 MR. TALBOT: Right. I am going to put
15 that.

16 CONSULTANT WALLIS: Yes, because people
17 might think it would be an issue.

18 CHAIRMAN SKILLMAN: Flammability is not an
19 issue.

20 MR. TALBOT: Flammable gases like
21 hydrogen --

22 CONSULTANT WALLIS: And oxygen. Without
23 the oxygen, it doesn't do much.

24 MR. TALBOT: -- or oxygen are not an issue
25 during pre-op tests.

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1 CHAIRMAN SKILLMAN: New plant pre-op.

2 MR. TALBOT: But something should be in
3 there to note, "Hey, you don't have to worry about
4 this because...."

5 CONSULTANT WALLIS: "Because," that is
6 right. Explain it. That is fine.

7 CHAIRMAN SKILLMAN: Okay. Teammates,
8 anything else on page 3, please?

9 (No response.)

10 On to page 4.

11 CONSULTANT WALLIS: Yes. Under 2.a, it
12 says, "The temperature of the RCS will be much higher
13 than that of the injection water and there will be a
14 thermal shock to piping in the reactor vessel." That
15 is just left there. It doesn't say --

16 MR. TALBOT: What page?

17 CONSULTANT WALLIS: What is the effect?
18 Are they supposed to measure it?

19 CHAIRMAN SKILLMAN: Page 4, 2.alpha, at
20 the middle.

21 CONSULTANT WALLIS: 2.a.

22 MR. TALBOT: Okay.

23 CHAIRMAN SKILLMAN: Right, 2.alpha.

24 CONSULTANT WALLIS: It is about 80 percent
25 of the way down.

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1 CHAIRMAN SKILLMAN: Right there. Up a
2 little bit. Up a little bit.

3 CONSULTANT WALLIS: It is under the last
4 sentence in 2.a.

5 CHAIRMAN SKILLMAN: 2.alpha, the last
6 sentence, temperature. Right there.

7 MR. TALBOT: Thermal shock.

8 CHAIRMAN SKILLMAN: Yes.

9 CONSULTANT WALLIS: Why do you say that?
10 Does that mean they are supposed to do something about
11 it? Are they supposed to measure how much the thermal
12 shock was or something? Why do you put it there?

13 MR. TALBOT: May I check with the
14 technical staff on that one?

15 CONSULTANT WALLIS: It is interesting
16 that --

17 MR. TALBOT: And I am also thinking, when
18 I reviewed the DCDs -- and this particular test is for
19 high-pressure safety injection -- I got some input
20 from the technical staff on the thermal shock.

21 CONSULTANT WALLIS: But if you say, you
22 must say what are they supposed to do about it.

23 CHAIRMAN SKILLMAN: Let me just offer a
24 comment from many years working for an NSSS vendor.

25 MR. TALBOT: Uh-hum.

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1 CHAIRMAN SKILLMAN: This is built into the
2 RCS functional specification and for the reactor
3 vessel functional specification. Thermal models are
4 designed for "X" number of transients.

5 And it seems to me that this sentence
6 either needs further explanation or it needs to be
7 eliminated.

8 MR. TALBOT: Right.

9 CHAIRMAN SKILLMAN: We know, the industry
10 knows that this phenomena will occur and it is part of
11 the ASME Section 3, Class 1, code analysis for that
12 vessel. It may be as simple as saying just confirm
13 that the startup transient or the startup cycles are
14 included.

15 MEMBER SHACK: Well, actually, it is up
16 there in the last sentence of the previous paragraph.

17 CHAIRMAN SKILLMAN: Okay.

18 MEMBER SHACK: Where you put the cold
19 fluid into the hot, and you have to document that,
20 that it has been done, because you have used up a
21 cycle, basically.

22 CHAIRMAN SKILLMAN: A cycle. Okay. So,
23 I am thinking that perhaps this sentence is a red
24 herring. It probably doesn't give you much traction,
25 and it provides an opportunity for a question that is

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1 just probably a waste of good time and energy. An
2 interesting sentence, but it doesn't do much for you.

3 MR. TALBOT: Okay. Could you give me your
4 comments, how I should address the thermal shock?
5 Please confirm if this is necessary guidance?

6 CONSULTANT WALLIS: Well, there is no
7 guidance here. It just says there will be a thermal
8 shock. There is no guidance about what to do about
9 it.

10 CHAIRMAN SKILLMAN: I would grab the whole
11 sentence and question whether the sentence adds value.

12 MEMBER SCHULTZ: What value is added by
13 this sentence?

14 CHAIRMAN SKILLMAN: Yes, what value is
15 added by the whole sentence?

16 MR. TALBOT: Okay.

17 MEMBER SHACK: You could put that sentence
18 before the "any planned or unplanned actuation"
19 sentence in the previous paragraph, just so that you
20 could sort of tell people why you ought to document
21 this sort of thing.

22 MR. TALBOT: What value is added by this
23 guidance, by the guidance in this sentence?

24 CHAIRMAN SKILLMAN: Yes, by the guidance
25 in the sentence.

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1 CONSULTANT WALLIS: Take it out.

2 (Laughter.)

3 CHAIRMAN SKILLMAN: Move it. Move it.

4 MR. TALBOT: Either take it out or move
5 it.

6 CHAIRMAN SKILLMAN: Yes, I don't think the
7 ACRS's role is to write your document for you.

8 (Laughter.)

9 But I think we have got some --

10 MEMBER SHACK: But we will do it, anyway.

11 (Laughter.)

12 CHAIRMAN SKILLMAN: We have got some sage
13 advice that may be valuable, and we will leave you to
14 determine what you might wish to do with it.

15 MR. TALBOT: Okay.

16 CHAIRMAN SKILLMAN: How is that, Frank?

17 MR. TALBOT: That works for me.

18 CHAIRMAN SKILLMAN: Okay. Team, anything
19 else on page 4 of 1.79?

20 (No response.)

21 Hearing none, we are on page 5.

22 CONSULTANT BONACA: Yes, I had a comment
23 regarding C.2.b.

24 MR. TALBOT: C.2.b?

25 CONSULTANT BONACA: Yes. And it had to do

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1 with NPSH. The way I read it -- maybe I am wrong --
2 is that, it says, "Containment pressure and pump fluid
3 temperature do not have to be controlled, but the NPSH
4 available should be adjusted to the maximum design
5 pump fluid, temperature," et cetera. And it means
6 these are the conditions for granting that pressure.

7 MEMBER SHACK: No, what he is saying is
8 you can't run the tests with the containment as hot as
9 it is going to be during an accident. So, you will
10 run, but, then, you will have to do analysis to
11 account for the changes in temperature and find out
12 whether you really would have had enough NPSH if
13 everything had been as hot as it should have been.

14 It is because you can't run a prototypical
15 test. You have to run what you can, and then make the
16 adjustments.

17 CONSULTANT WALLIS: That is not what I
18 learned. I thought it meant should be adjusted during
19 the test, not after the test. It is not explicit
20 enough.

21 CHAIRMAN SKILLMAN: Well, I think the way
22 to respond to this is to add the word "calculated"
23 before "NPSH" in the third line at bravo. But the
24 calculated NPSH should be adjusted.

25 Because the way that sentence reads, that

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1 presumes that you are able to do some online
2 adjustment during testing. And you know what? You
3 can't.

4 CONSULTANT WALLIS: That is what I thought
5 it meant.

6 CHAIRMAN SKILLMAN: Yes, that is what it
7 seems to point to. You are talking about the
8 calculated NPSH.

9 MEMBER SHACK: No, it is sort of like what
10 the measured NPSH available should be adjusted,
11 because you are going to measure some value and then
12 you are going to adjust that value to the accident
13 conditions and make sure that you are going to be --

14 CONSULTANT WALLIS: Well, maybe you need
15 another sentence or something.

16 MEMBER SHACK: Well, I just think if you
17 made it "But the measured NPSH available should
18 be...," that would sort of get rid of that confusion,
19 I think.

20 CONSULTANT WALLIS: No, it doesn't really.
21 If you said, "When calculating the real available
22 NPSH, you should adjust the measured one" so-and-so.
23 I mean, make it clear.

24 MEMBER SHACK: We don't want to write it
25 for them.

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1 CONSULTANT WALLIS: Make it explicit.

2 CHAIRMAN SKILLMAN: Yes, "Measure the
3 calculated?", question mark. The way that bravo is
4 provided there, Frank --

5 MR. TALBOT: "Measure or calculated NPSH".

6 CHAIRMAN SKILLMAN: That would suggest
7 that you actually fill your containment to some level,
8 adjust pressure, and confirm your RHR pumps or your
9 decay heat pumps are able to function for what you
10 believe the exiting conditions will be. I don't think
11 anybody is going to do that. I don't think anybody is
12 going to put 6 feet of water in their sump and see how
13 it works.

14 And so, I think you need to fix that
15 wording so it is precise and accurate for what you
16 really intend. And part of this is going to be
17 analytical adjustment in order to confirm operability
18 in a pre-op.

19 MEMBER SHACK: And then, you are going to
20 postulate some effect of the debris.

21 CHAIRMAN SKILLMAN: Correct. Yes. So,
22 words matter, and in this particular case I think
23 the --

24 MR. TALBOT: Does that reflect the
25 comment?

1 CHAIRMAN SKILLMAN: That is correct. Yes,
2 that is sufficient --

3 MR. TALBOT: "The word does not seem
4 correct."

5 CHAIRMAN SKILLMAN: It is either "this
6 choice" or "these choices".

7 We have launched the thought.

8 MR. TALBOT: Yes.

9 CHAIRMAN SKILLMAN: Okay. Thank you.
10 Zena, thank you.

11 MR. TALBOT: Okay, next comment?

12 CHAIRMAN SKILLMAN: Okay. Team, anything
13 else on page 5, please? Graham, anything else?

14 CONSULTANT WALLIS: No.

15 MEMBER SCHULTZ: Well, here below, in that
16 same paragraph --

17 MR. TALBOT: Oh, I have got to go back up?

18 MEMBER SCHULTZ: Yes. You have, it is
19 just a note to you that you are talking about the
20 effect of debris here. You refer it to the regulatory
21 position C.2.c(2).

22 MR. TALBOT: Uh-hum.

23 MEMBER SCHULTZ: But, as we noted there,
24 to me, this is just not that clear. In one place, you
25 say, "The effect of debris should be considered when

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1 evaluating the test results," and in C.2.c(2) you say,
2 "Make sure you don't have any debris when you perform
3 the test."

4 MR. TALBOT: More specificity?

5 MEMBER SCHULTZ: Well, yes, you say two
6 different -- one thing here and another under
7 C.2.c(2).

8 MR. TALBOT: More and consistent?

9 MEMBER SCHULTZ: Yes, consistent.

10 MR. TALBOT: "And consistent specificity
11 should be used in this paragraph. There is confusion
12 between this sentence and what is in regulatory
13 position C.2.c(2)." Does that reflect the kind of
14 comment you would like on this?

15 MEMBER SCHULTZ: Yes.

16 MR. TALBOT: Okay.

17 CHAIRMAN SKILLMAN: Steve, thank you.

18 MR. TALBOT: That helps.

19 Okay, team, anybody else, comments on page
20 5?

21 (No response.)

22 Okay. Page 6. I would offer that the
23 word at 3.alpha, the next-to-the-last sentence,
24 "cycling," when you see "cycling" down there --
25 3.alpha, the last sentence.

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1 MR. TALBOT: "To minimize the thermal
2 cycling" --

3 CHAIRMAN SKILLMAN: Yes.

4 MR. TALBOT: -- "the isolation should be
5 closed as soon as the check valve operation is
6 verified."

7 CHAIRMAN SKILLMAN: I would just challenge
8 whether the word "cycling" is the accurate word or
9 "shock" is the accurate word. They are probably both
10 accurate, but I think "shock" is the more accurate of
11 the two. "Cycling" kind of conveys the notion that
12 you have an oscillation; whereas, shock is the bulk
13 temperature difference against the metal sections.
14 That is the thought. That is good. Thanks.

15 MEMBER SHACK: Why don't you just make it
16 "transient"? That way, you cover both.

17 CHAIRMAN SKILLMAN: Yes. Yes, it could be
18 just "thermal transient" would resolve my issue. We
19 will leave it up to you, Frank.

20 That is all I had on page. Anybody else,
21 page 6?

22 (No response.)

23 Page 7.

24 CONSULTANT WALLIS: Page 7, F.1.b, "Verify
25 design acceptance criteria are meant for operation of

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1 the vacuum breakers in ADS discharge lines." How do
2 you think they are going to do that?

3 MR. TALBOT: Page 7, where are you?

4 CONSULTANT WALLIS: F.1.b. It is about a
5 quarter of the way down.

6 MR. TALBOT: "Verify design acceptance
7 criteria are met for operation of the vacuum breaks in
8 the ADS discharge lines."

9 CONSULTANT WALLIS: So, they have to set
10 up a transient that makes them open and shut, or what?
11 What are they supposed to do? They are supposed to
12 actually set up a transient that makes them open and
13 shut?

14 MEMBER SHACK: Well, actually, set up some
15 conditions to make them open and shut.

16 CONSULTANT WALLIS: How do they --

17 MEMBER SHACK: I don't think they will
18 want a transient in the plant.

19 CONSULTANT WALLIS: So, you expect them
20 set up --

21 MR. TALBOT: Yes, you don't want to
22 deliberately have a transient.

23 CONSULTANT WALLIS: -- some conditions in
24 the plant that makes them operate? Or do you expect
25 them to design some test that they put into the plant?

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1 I am not quite sure how you do this.

2 CHAIRMAN SKILLMAN: It seems to me that in
3 this section there is a new phrase that is used that
4 is unique for the Part 52 licenses, and that is "DAC".
5 You have zeroed in on D-A-C.

6 MR. TALBOT: Yes, design acceptance
7 criteria.

8 CHAIRMAN SKILLMAN: And design acceptance
9 criteria carries with it requirements for
10 acceptability. So, when you say "Verify DAC," there
11 is a companion document for how to do DAC. I believe
12 that that is the answer to Dr. Wallis' question. If
13 you do what DAC requires you to do, you have fulfilled
14 this. But that is not obvious to people who haven't
15 worked on the Part 52 side. If you are over on the
16 Part 20 side, "DAC" is not a term that you would use.

17 CONSULTANT WALLIS: But does it have to be
18 done once the plant is built? Could it have been done
19 before?

20 CHAIRMAN SKILLMAN: Well, under AP1000,
21 see, it will be DAC; it will design acceptance
22 criteria.

23 CONSULTANT WALLIS: Yes, so you don't have
24 to build the plant and then do the tests.

25 MR. TALBOT: And remember, that is on the

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1 laundry list of DAC items, that vacuum breakers have
2 that, right? I think I saw that. It is like I&C,
3 too. They have that big DAC on them --

4 CHAIRMAN SKILLMAN: Correct.

5 MR. TALBOT: -- for digital I&C. I think
6 this is also on that laundry list.

7 CHAIRMAN SKILLMAN: So, I think the answer
8 to Dr. Wallis' question is, how do you verify, DAC has
9 its own evaluation --

10 CONSULTANT WALLIS: But you don't have to
11 wait to build the whole plant before you do this, do
12 you? Are you going to do this in situ or are you
13 going to do it in a separate test?

14 CHAIRMAN SKILLMAN: In some cases, you
15 have cases you have to do it in separate tests.

16 CONSULTANT WALLIS: Okay, because the
17 impression I got was you have got to do all this after
18 you have built the plant, which I don't think is
19 always true, is it?

20 CHAIRMAN SKILLMAN: I think that is all
21 incremental.

22 MEMBER SHACK: To the extent possible, I
23 think it is true. I mean, you are supposed to test
24 what you can in the plant.

25 CHAIRMAN SKILLMAN: Yes, I think it is all

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1 incremental as the plant is being built up.

2 MEMBER SHACK: Obviously, you are not
3 going to test the ADS Stage 4 in the plant.

4 CONSULTANT WALLIS: Well, they don't say
5 you should in here, no.

6 (Laughter.)

7 MR. TALBOT: The way I wrote this one,
8 "How do you verify these tests on the vacuum breakers?
9 There is design acceptance criteria. The DAC has
10 information related to meeting acceptance criteria for
11 the vacuum breakers." Does that satisfy what you --

12 CONSULTANT WALLIS: It probably applies to
13 several of these things here, yes.

14 MEMBER REMPE: Isn't the comment really to
15 point to the DAC? This is all AP1000-specific.

16 CHAIRMAN SKILLMAN: Yes, right.

17 MEMBER REMPE: To follow the processes
18 specified in the DAC, if that is true that it is
19 specified in the DAC?

20 CHAIRMAN SKILLMAN: That is what I believe
21 the answer is to Graham's question.

22 MEMBER SHACK: And I believe the answer is
23 to take acceptance out of this.

24 CHAIRMAN SKILLMAN: Oh, take the DAC out
25 of this?

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1 MEMBER SHACK: I think what they really
2 want you to do is to verify design criteria for these
3 things. That is why you are going to simulate the
4 flood, containment flood --

5 MR. TALBOT: You are doing a test to
6 verify the design criteria.

7 MEMBER SHACK: You are doing a test to --
8 this is not really DAC in the big-picture sense of the
9 DAC.

10 MR. TALBOT: But it does give you what the
11 acceptance criteria is.

12 MEMBER SHACK: Right. The DAC will, in
13 fact, include these design criteria.

14 MR. TALBOT: And the test should have
15 something related to how you are going to meet that --

16 MEMBER SHACK: This is a very small subset
17 of the DAC process. This is the final step of the DAC
18 process when you are finally in the plant making sure
19 the as-built component does what it is supposed to do.

20 CHAIRMAN SKILLMAN: Do what they are
21 supposed to do.

22 MEMBER SHACK: And whether acceptance is
23 helpful here or not, to me is kind of moot.

24 CHAIRMAN SKILLMAN: I am not sure if we
25 have muddied the water or clarified the water.

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1 MEMBER SHACK: Well, they can think about
2 it.

3 MR. TALBOT: We will research.

4 CONSULTANT WALLIS: Don't muddy the water.
5 Then, you catch the mud on the strainer.

6 (Laughter.)

7 CHAIRMAN SKILLMAN: Okay, Graham, are you
8 good with this?

9 CONSULTANT WALLIS: Yes.

10 CHAIRMAN SKILLMAN: Okay, let's --

11 MEMBER REMPE: I have a question on Item
12 2, where it says that "Any planned or unplanned
13 actuation of the PCCS that results in the injection of
14 cold fluid into the hot RCS should be documented in
15 the records."

16 MR. TALBOT: Uh-hum.

17 MEMBER REMPE: What if it is unplanned and
18 it is a big deal? Do you just document and go on? I
19 didn't quite understand that statement.

20 MR. TALBOT: The regulatory position C.3
21 is for documentation. I think the intent was that
22 they should document both planned or unplanned.

23 CONSULTANT WALLIS: Because of thermal
24 shock, isn't it? Why don't you say that?

25 MEMBER REMPE: But if it unplanned, does

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1 something need to be done so that that doesn't happen?

2 MR. TALBOT: That is interesting. I am
3 wondering if "unplanned" is necessary, because usually
4 under ITP we are talking about planned tests.

5 MEMBER SHACK: Well, no, no. I mean, you
6 could be setting this thing up and accidentally --

7 CHAIRMAN SKILLMAN: And you will want to
8 log the one that you didn't anticipate.

9 MEMBER SHACK: Yes. No, you want planned
10 and unplanned.

11 MR. TALBOT: Okay.

12 MEMBER SHACK: I mean, Joy's question is,
13 okay, what do you do when you have an unplanned one?
14 And I think that is sort of --

15 CHAIRMAN SKILLMAN: That is a different
16 issue.

17 MEMBER SHACK: That is a different issue.

18 CHAIRMAN SKILLMAN: But it is an important
19 issue.

20 MEMBER RYAN: Is there a reference to some
21 other place where you would say, "Go to Section" so-
22 and-so to see what to do about an unplanned event?

23 MEMBER REMPE: I think if someone messed
24 up accidentally, that is one thing. But if it is
25 something that is an issue, it seems like it is a big

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1 deal.

2 CHAIRMAN SKILLMAN: Yes. Well, the real
3 issue is, if your system logic does something that you
4 didn't anticipate, that is good and bad. First of
5 all, it is good that you found it. But, second of
6 all, you will say, "Gee whiz, what do I do now? What
7 are the other effects of what I have just learned, and
8 what is the extent of condition?" So, it is a good
9 question.

10 MEMBER SHACK: Yes, but it makes a big
11 difference whether it was a screwup or something more.

12 (Laughter.)

13 CHAIRMAN SKILLMAN: Right. Right.

14 MR. TALBOT: It reminds me of reportable
15 events under 5072 and 5073. Yes, you want to do the
16 lessons learned from the reportable events. So, you
17 have to document those.

18 CHAIRMAN SKILLMAN: Okay. Let's keep
19 moving. Any other comments?

20 CONSULTANT WALLIS: It is 7, yes, near the
21 bottom.

22 MEMBER REMPE: There are some cases that
23 should be addressed. I think it should acknowledge
24 that, and take appropriate actions as required by
25 whatever the other document is that it requires what

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1 to do.

2 MR. TALBOT: Okay,

3 CONSULTANT WALLIS: G(1), it says,

4 "Determine the resistance of the CMT cold leg balance
5 lines," blah, blah, blah. What are you supposed to do
6 with that? Is it supposed to meet a criterion?
7 Suppose it is too big. What do you do? Just
8 determining it is the first step in some process,
9 presumably. Shouldn't you say, "Determine the
10 resistance and check that it meets acceptance
11 criteria," or something?

12 MEMBER SHACK: Well, that is part of the
13 system actuation and flow rates.

14 CONSULTANT WALLIS: Yes, but why do you
15 determine it? I mean, what are you supposed to do
16 once you have determined it?

17 MEMBER SCHULTZ: Well, you put in an
18 equation.

19 MR. TALBOT: "Determine the resistance and
20 check it against its acceptance criteria."?

21 CONSULTANT WALLIS: Something like that,
22 yes.

23 MR. TALBOT: Does that make sense, about
24 additional information that necessary possibly?

25 CONSULTANT WALLIS: Well, you should know

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1 what you are supposed to do with it once you have
2 measured it.

3 MR. TALBOT: Okay. I understand. Okay.

4 CHAIRMAN SKILLMAN: Page 7, any more
5 comments?

6 (No response.)

7 Team, page 8, please. Comments?

8 CONSULTANT WALLIS: Yes. All this
9 criticism doesn't really bring out the point that most
10 of this is written very well.

11 MR. TALBOT: Thank you. I tried hard. It
12 was quite, actually, a difficult document to put
13 together because I had to go through a lot of staff
14 comments internally as well as interoffice review
15 comments from OGC, Research, NRR, and now ACRS.

16 CHAIRMAN SKILLMAN: I do have a comment on
17 this page.

18 MR. TALBOT: Uh-hum.

19 CHAIRMAN SKILLMAN: It is at H.2.b., the
20 second sentence. "The heat transfer rate measured in
21 a test should be adjusted to account for differences
22 in hot leg and IRWST temperatures as well as the
23 number of tubes plugged." How do you really do that?
24 Think about that. "Number of tubes plugged"? That is
25 a variable that is very difficult to predict, unless

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1 you were to say, "I have got 10-percent plugging and
2 I am going to presume that my UA has been adjusted
3 because my "A" is 10 percent less." Then I can
4 understand that sentence.

5 But if the number of tubes plugged is a
6 variable, I believe that you have an equation you
7 can't solve. If you were to say, "The maximum number
8 of tubes plugged," then I now have the minimum area,
9 then I could understand what you mean. If you say
10 "the minimum number of tubes plugged," in the worst
11 cases I have a very high differential temperature, and
12 I remove more heat than I want to.

13 But the way that is written, my sense is
14 it is very difficult to interpret.

15 MEMBER SCHULTZ: Well, again, this is a
16 question of whether we are performing the test and
17 evaluating performance of the test. There is a
18 possibility that there are going to be tubes plugged
19 when the test is performed, even pre-op, but it is
20 unlikely.

21 MEMBER SHACK: Yes, if you are going
22 through, you know, there may have been a defect or
23 two. You plugged it up.

24 MEMBER SCHULTZ: What you are talking
25 about, Dick, is are we trying to validate something

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1 that is a calculation that was done with assumption
2 that tubes are plugged.

3 MR. TALBOT: We just don't want another
4 San Onofre.

5 CHAIRMAN SKILLMAN: Well, no. Steve has
6 pointed to something that I was not thinking about.
7 He is right, exactly.

8 MEMBER SCHULTZ: And that is why it needs
9 to be examined more carefully to determine what the
10 intention is here. Then, the sentence should be
11 something along the lines, "as well as the number of
12 actual tubes plugged for the" --

13 CHAIRMAN SKILLMAN: At the time of the
14 test.

15 MEMBER SCHULTZ: -- "at the time of the
16 test."

17 MEMBER SHACK: Yes, that would remove the
18 ambiguity.

19 CHAIRMAN SKILLMAN: Right. Yes. That is
20 a good point, Steve.

21 MEMBER SCHULTZ: I just read it
22 differently, and it is the same words, so it needs to
23 be clarified.

24 CONSULTANT WALLIS: When you say
25 "differences in hot leg and some of the temperatures,"

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1 you mean differences between those in the tests and
2 those expected during some other event or something?
3 What is the difference you are talking about?

4 MR. TALBOT: I think that was just
5 differences in the hot leg temperature versus what the
6 temperature in the IRWST is.

7 CONSULTANT WALLIS: What do you mean?
8 What differences are these? The differences between
9 what and what?

10 MR. TALBOT: You have two different
11 temperature locations, the temperature of the hot leg
12 and the temperature in the IRWST.

13 CONSULTANT WALLIS: What, differences
14 between?

15 MR. TALBOT: Yes. There may be a better
16 word.

17 CONSULTANT WALLIS: Is it really
18 "between"? Why would you adjust it for that? I think
19 it you are trying to adjust it for differences between
20 the tests and something else that you are trying to
21 validate. So, you have some sort of equation you put
22 this into. I don't understand it.

23 You say you are trying to evaluate core
24 decay heat removal.

25 MR. TALBOT: Yes.

1 CONSULTANT WALLIS: You don't have any
2 core decay heat yet. So, you can't do that test. You
3 do some sort of a test, and then you adjust it to what
4 you think the emergency core decay heat removal might
5 be, don't you?

6 MR. TALBOT: Uh-hum.

7 CONSULTANT WALLIS: But that is not at all
8 clear from the language here.

9 MEMBER SHACK: That is how I interpreted
10 it.

11 CONSULTANT WALLIS: You might guess that
12 that is what you are trying to say.

13 MR. TALBOT: Gordon, does that added
14 information reflect his comment?

15 CHAIRMAN SKILLMAN: Yes. Yes.

16 MR. TALBOT: Heat transfer equation.
17 Okay. Let me read this back to you, make sure this
18 captures what you are looking for.

19 "What percentage of tubes plugged? This
20 is too general to interpret. Should it be a minimum
21 or maximum number of tubes plugged? What percentage
22 of tubes plugged at the time of the test? Is this the
23 difference in temperature between the hot leg and the
24 IRWST? Please verify, probably from a heat transfer
25 equation."

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1 CONSULTANT WALLIS: Say that last bit
2 again.

3 MR. TALBOT: "Please verify, probably from
4 a heat transfer equation." I have seen them for steam
5 generators and such. So, there is probably something
6 that I can find related to that.

7 CHAIRMAN SKILLMAN: That is a very general
8 comment. I think it covers the thought, but I --

9 CONSULTANT WALLIS: The bottom line of
10 this test is to verify that emergency core decay heat
11 can be removed.

12 MR. TALBOT: Yes.

13 CONSULTANT WALLIS: And it is not clear to
14 me what you have to do to the data you get in the test
15 in order to verify that. Could you be more explicit
16 about how you take the data from the test and do
17 something with it?

18 MR. TALBOT: I think with the acceptance
19 criteria for heat transfer, that it is meeting its
20 capability. I remember doing it for the nuclear
21 engineering PE exam on other type of heat exchangers,
22 like the RWCU heat exchangers used on the ESBWR
23 design. I wrote one for the heat transfer capacity of
24 that heat exchanger for removing decay heat after
25 shutdown.

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1 CONSULTANT WALLIS: So, it is using kind
2 of a thermal dynamic model of the heat exchanger?

3 MR. TALBOT: Yes, yes.

4 CONSULTANT WALLIS: Well, maybe you need
5 to say more.

6 CHAIRMAN SKILLMAN: So, I think what Dr.
7 Wallis is saying is add to that sentence the phrase --

8 MR. TALBOT: I think it is, for these
9 passive cooling systems, they are supposed to do their
10 function for 72 hours.

11 CHAIRMAN SKILLMAN: Well, why don't you
12 add a phrase that challenges, confirms that this test
13 verifies the design decay heat removal rate? Confirm
14 that this test --

15 MR. TALBOT: "This test" --

16 CHAIRMAN SKILLMAN: -- verifies --

17 MR. TALBOT: -- "verifies" --

18 CONSULTANT WALLIS: What it is really
19 verifying of some correlation for heat transfer
20 coefficient in this exchanger, is what it is really
21 verifying.

22 MR. TALBOT: "Heat removal capability is
23 consistent with" I think the information in probably
24 design certification documentation.

25 CHAIRMAN SKILLMAN: With that required.

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1 With that required.

2 MR. TALBOT: "Required."

3 CHAIRMAN SKILLMAN: Yes, that will do it.

4 MR. TALBOT: Okay.

5 CHAIRMAN SKILLMAN: Thank you.

6 MR. TALBOT: Okay. Now we are into
7 component --

8 CHAIRMAN SKILLMAN: Okay. Team, comments
9 on page 9?

10 CONSULTANT WALLIS: Well, there is the
11 clogged-with-debris comment, you know, C.2, three-
12 quarters of the way down. We have talked about that
13 a lot, and I think you know what to do.

14 What is it you are looking for? Do you
15 just look at it? Do you measure something? What do
16 you expect them to do?

17 MR. TALBOT: This is C.2, "Verify
18 design" --

19 CONSULTANT WALLIS: "Verify the pump
20 suction strainer is not clogged with debris," so the
21 pump failure situation does not occur.

22 Are you expecting them to measure pressure
23 drop across the strainer or look at it or what
24 specifically do you mean by "clogged with debris"?

25 I think you need a couple of sentences

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1 which say sort of -- first of all, you want an
2 observation, is the debris on it? And then, you want
3 a measurement of how much pressure drop does it cause.

4 MEMBER SHACK: No, I think this is to get
5 the rags and the stuff out of the system. You know,
6 we are not going to do GSI-191 with this test.

7 CONSULTANT WALLIS: Well, it isn't going
8 to be clogged by a rag.

9 MEMBER SHACK: Well, it is going to be --
10 "clogged" might not be the right word, but you want to
11 make sure that there is no debris around. You want to
12 clean up any debris that might be in it.

13 CONSULTANT WALLIS: Well, then, say that.
14 But "clogged with debris," to me means it is
15 absolutely solid with debris.

16 MS. KAVANAGH: Yes, but if you remember
17 right, back in the early nineties, with the
18 rubberband, the old plastic bag got caught on the
19 strainer, and that was considered clogged. So, I
20 mean, the terminology goes back, you know, way to the
21 beginning, before GSI-191, back to Generic Letter
22 96-03.

23 CONSULTANT WALLIS: I think you want some
24 evaluation of any debris that happens to be deposited
25 on the strainer.

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1 MEMBER SHACK: You mostly want to get rid
2 of any debris in the system. Do you want plastic
3 bags.

4 CHAIRMAN SKILLMAN: This is pre-
5 operational testing, and this is really intended to
6 get the plastic bags, the cans, the diapers that are
7 used --

8 (Laughter.)

9 Actually, they are used. No, diapers are
10 used for cleaning stainless steel piping. They are
11 very effective. They are low cotton and they are low
12 fiber. It is a very effective cleaning agent, and
13 they get left and they get stuck on pump impellers.
14 They get stuck in debris strainers.

15 So, that is what this is going at. This
16 is a pre-op test. This is not five years after the
17 plant has been started up. And there is stuff that
18 gets left in piping. They put Masslinn cloth in there
19 to wipe before the radiographers go in and look at
20 stuff. So, this is good stuff.

21 MS. KAVANAGH: But we are more than
22 willing to make it clear as to what we are looking
23 for.

24 CONSULTANT WALLIS: But, you see, the
25 design criteria could be met perfectly well, even with

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1 the typos. So, what are you supposed to do?

2 MEMBER RYAN: It may just be me, but --

3 MEMBER SHACK: Get rid of the debris.

4 MEMBER RYAN: -- capturing Dick's comment
5 in a footnote, that this is pre-operational and post-
6 construction, in that context of what you are doing,
7 to differentiate it from blocked strainers during
8 operations, probably would be very helpful.

9 MS. KAVANAGH: Thank you.

10 MS. ABDULLAHI: Isn't it called foreign
11 material, right?

12 MS. KAVANAGH: Yes, people take offense to
13 foreign material. So, we have to be very careful.

14 CHAIRMAN SKILLMAN: Yes, FME is a whole
15 different deal.

16 MS. KAVANAGH: It is, yes.

17 CHAIRMAN SKILLMAN: This is construction
18 debris --

19 MS. KAVANAGH: Yes.

20 CHAIRMAN SKILLMAN: -- is what we are
21 really talking about here.

22 MR. TALBOT: That is the word I was
23 looking for.

24 CHAIRMAN SKILLMAN: It is the 2x4 in your
25 circ water piping.

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1 MR. TALBOT: Yes.

2 CHAIRMAN SKILLMAN: I have seen it; there
3 it is. I am glad it wasn't a 4x4.

4 (Laughter.)

5 CONSULTANT WALLIS: "Verify that it is not
6 clogged and does not do that." It could be covered
7 with --

8 MR. TALBOT: Let me read this back to you,
9 see if this reflects your comment properly.

10 "How do you verify this during testing?
11 You need to verify by inspection that no foreign
12 material is in the sump. Rags, construction debris,
13 tools, et cetera." Does that reflect your comment?

14 CHAIRMAN SKILLMAN: That satisfies --

15 CONSULTANT WALLIS: That is better. That
16 is better.

17 CHAIRMAN SKILLMAN: Good. Okay.

18 I would like to go up to B.1, right at the
19 top of the page. You use the term "limiting design
20 condition". It is in the third line. "Its limit
21 design condition." I would like that to be described
22 somehow. What in the world is that? Where does that
23 come from? What is the basis? Just what is the
24 basis? Describe.

25 Okay, let's go down to C, Pumps and

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1 Motors. I would have expected pump testing and motor
2 testing or pump data and motor data to be split from
3 one another.

4 MR. TALBOT: That is a good comment. You
5 know, I struggled with that one because in the past
6 the Reg. Guide had pumps and motors together from the
7 previous Reg. Guide 1.79, Rev. I guess 1.

8 CHAIRMAN SKILLMAN: Uh-hum.

9 MR. TALBOT: And I guess I was reluctant
10 to separate motors out. But, I mean, like that whole
11 issue with No. 5, it is a motor issue, not a pump
12 issue.

13 CHAIRMAN SKILLMAN: Yes, here is what I
14 was going to say. Pump is QNPSH, head revocation,
15 conformance with head capacity curve, vibration, NPSH,
16 NPSH requirement; motors, rotation, direction,
17 temperature, vibration, and amps. And so, they are
18 fundamentally different parameters.

19 When you are actually in the test program,
20 you do end up confirming both, but you actually use
21 different diagnostic tools for each. And so, I think
22 that there is a case to be made for checking your
23 motors and checking your pumps. And they use
24 different standards, and they use different equipment.

25 CONSULTANT WALLIS: Some of the pumps are

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1 run by turbines.

2 CHAIRMAN SKILLMAN: Yes, that is true.
3 Yes. Good old Worthington emergency fuel water pumps.

4 I would offer, Frank, that I think there
5 is value in --

6 MR. TALBOT: Oh, yes, I can see doing
7 that.

8 CHAIRMAN SKILLMAN: -- splitting the two.

9 MR. TALBOT: It is easy.

10 CHAIRMAN SKILLMAN: And you could keep 1
11 through 6 and do one for motors and one for pumps, and
12 the diagnostic equipment that you would use and the
13 standards that you would use would be different.

14 One of the most important things is the
15 motor turning in the correct direction. It gets
16 overlooked every time.

17 MR. TALBOT: Okay. Let me read this back
18 to you.

19 "Why don't you separate pumps and motors
20 into its own C.2 sections? You should split this out
21 into one section for pumps and one for motors."

22 CHAIRMAN SKILLMAN: And use appropriate
23 standards for each.

24 MR. TALBOT: Okay. "And use appropriate
25 standards". Industry standards?

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1 CHAIRMAN SKILLMAN: Yes. Section 11 of
2 the Code leads you right into that. It is all set up
3 for you.

4 Good.

5 CONSULTANT WALLIS: Turbines have start
6 sequences and response times, too. Turbines that
7 drive pumps, are you going to say anything about them
8 at all?

9 MS. KAVANAGH: I am not sure any of the
10 new designs actually have turbines that run the pumps.
11 I would have to verify them for you.

12 MR. TALBOT: Speaking of the RCIC Terry?

13 CONSULTANT WALLIS: Is it the BWRs that
14 have turbines?

15 CHAIRMAN SKILLMAN: Yes.

16 CONSULTANT WALLIS: Okay. That is what it
17 is.

18 CHAIRMAN SKILLMAN: So, let's pick that up
19 on 1.79.1, Graham.

20 CONSULTANT WALLIS: We will pick that up
21 on that one.

22 MR. TALBOT: Okay. So, RCIC Terry
23 turbines is what he is thinking, right?

24 CHAIRMAN SKILLMAN: Yes, but that will be
25 in 1.79.1.

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1 MR. TALBOT: Yes. Well, aux feedwater
2 still has them, too.

3 MS. KAVANAGH: That is not --

4 MR. TALBOT: Oh, that is not ECCS.

5 CHAIRMAN SKILLMAN: That is not ECCS.

6 MR. TALBOT: That is under Reg. Guide
7 1.68.1.

8 CHAIRMAN SKILLMAN: That is not ECCS.

9 MR. TALBOT: That is not ECCS. That is
10 under Reg Guide 1.68.1. Okay. We will move on.

11 CHAIRMAN SKILLMAN: Page 10. I have one
12 question on page 10 at E, Power Supplies. You might
13 think it is vague question, but it is a challenge
14 question. How does the test account for degraded
15 voltage and frequency?

16 Okay. Thank you.

17 MR. TALBOT: Got it.

18 CHAIRMAN SKILLMAN: That is all I had on
19 that, page 10.

20 Anybody else, page 10?

21 CONSULTANT WALLIS: On piping systems, I
22 don't know this ASME code, but does it look at
23 displacement of pipes as well as vibrations? When you
24 have a starting transient that jerks things, does
25 that --

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1 MEMBER SHACK: You would see that in
2 there?

3 CONSULTANT WALLIS: That would be in the
4 ASME?

5 MR. TALBOT: Valves, pumps, motors,
6 piping, controls, currents. Okay. Yes, in this case
7 we do have ASME Section 3.

8 Is there any comment for C.2.f?

9 CHAIRMAN SKILLMAN: Graham, did you want
10 to offer comment there?

11 CONSULTANT WALLIS: Well, I guess if you
12 got a water hammer, you would have piping movements
13 which might not be covered by this guide.

14 CHAIRMAN SKILLMAN: It might not be.

15 CONSULTANT WALLIS: And is this the one
16 where they have to verify there is no water hammer?
17 Or that is in the other guide, isn't it?

18 CHAIRMAN SKILLMAN: I think that is in
19 1.79.1.

20 MR. TALBOT: As I remember, water hammer
21 was specifically discussed --

22 CONSULTANT WALLIS: For BWRs.

23 MR. TALBOT: -- under the system tests,
24 things like how do you do that. This has more
25 guidance at least from the ASME code. I can see what

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1 I can find under the ASME code for dealing with water
2 hammer, see if it is specific enough to point to that.

3 CHAIRMAN SKILLMAN: Okay. I want to defer
4 to Dr. Wallis. Would you like to see that as a
5 comment here? Water hammer? Curiosity? You know,
6 should water hammer be here?

7 CONSULTANT WALLIS: Well, I just know that
8 the only time I have been worried about piping
9 movement is when they broke hangers and things, and
10 this was usually because of water hammer.

11 CHAIRMAN SKILLMAN: Water hammer? Leave
12 it in there.

13 Okay. Any other -- excuse me.

14 MEMBER REMPE: Since we are making all
15 these notes here on the documentation, is this where
16 you wanted to include the statement about --

17 MR. TALBOT: The 60 days?

18 MEMBER REMPE: Yes.

19 MR. TALBOT: Yes. I got you.

20 MEMBER REMPE: I know it has already been
21 discussed, but just for your notekeeping.

22 MR. TALBOT: Yes, but that is where we
23 want to capture it.

24 MEMBER REMPE: Okay. So, maybe you ought
25 to add a comment there.

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1 MR. TALBOT: Okay. I think that captured
2 both of your comments. Sixty days before intended
3 use, that is the guidance of Reg. Guide 1.68, roughly.

4 CHAIRMAN SKILLMAN: Thank you.

5 Okay. Team, any more comments on page 10,
6 please?

7 (No response.)

8 If not, we are on page 11. If there are
9 no comments on the top several words of page 11, then
10 I would suggest that everything that follows is
11 essentially boilerplate, unless you have comments on
12 the acronyms or on the appendices.

13 MR. TALBOT: Please note, on the document
14 implementation section, that guidance comes from OGC.

15 CHAIRMAN SKILLMAN: Uh-hum, that is what
16 I was saying; it is boilerplate.

17 MR. TALBOT: Yes, OGC boilerplate.

18 (Laughter.)

19 CHAIRMAN SKILLMAN: I am not being
20 pejorative. I am just saying we don't need to mess
21 with that in this meeting.

22 MR. TALBOT: Great.

23 CHAIRMAN SKILLMAN: So, Team, if there are
24 no more comments, I would suggest we take a 15-minute
25 break and return and come back to 1.79.1. Going once,

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1 twice, 15 minutes. We will see you at 20 after on
2 that clock.

3 (Whereupon, the foregoing matter went off
4 the record at 3:05 p.m. and went back on the record at
5 3:21 p.m.)

6 CHAIRMAN SKILLMAN: Ladies and gentlemen,
7 back in session, please.

8 Reg. Guide 1.79.1, page 1, comments,
9 please.

10 (No response.)

11 None. Page 2, Reg. Guide 1.79.1.

12 (No response.)

13 Hearing none, Reg. Guide 1.79.1, page 3.

14 CONSULTANT WALLIS: The same as on the
15 other Reg. Guide.

16 CHAIRMAN SKILLMAN: Yes. Frank, that will
17 be a common comment where we have commented on 1.79
18 and the wording is the same in 1.79.1. Then, the
19 comments from 1.79 would carry over also onto 1.79.1.

20 MR. TALBOT: Okay. Specifically, where in
21 this one --

22 CHAIRMAN SKILLMAN: Well, we would have to
23 go back to the previous document.

24 MEMBER SCHULTZ: Can you just check it
25 from your other one?

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1 CHAIRMAN SKILLMAN: It would be in your
2 other document.

3 MR. TALBOT: Okay.

4 CHAIRMAN SKILLMAN: See what I am saying.

5 MR. TALBOT: Let me minimize this and open
6 up the other one.

7 CHAIRMAN SKILLMAN: Zena, go ahead.

8 MS. ABDULLAHI: I was thinking that, in
9 that case, you would just write in the statement,
10 which is the same as the comment in the other Reg.
11 Guide, instead of going back and filling in the gap
12 now, to save time.

13 MEMBER SCHULTZ: You don't have to type it
14 a second time.

15 MS. ABDULLAHI: Yes.

16 MR. TALBOT: Yes, I understand.

17 CHAIRMAN SKILLMAN: What we are saying is,
18 would you please compare the two and bring over into
19 1.79.1 those comments at the same paragraphs of 1.79.

20 MR. TALBOT: In two places, A.2 and A.3,
21 which is actually A.1 and A.2.

22 CHAIRMAN SKILLMAN: Yes, but I would just
23 make that as a general comment.

24 MR. TALBOT: Okay.

25 CHAIRMAN SKILLMAN: I think in almost all

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1 cases, the comments will be applicable to both
2 documents. We may find some more as we go more deeply
3 into 1.79.1.

4 MR. TALBOT: Yes.

5 MEMBER SCHULTZ: The reverse is true,
6 also; if we make comments here that are applicable to
7 the other document, we are asking you to fix those,
8 too.

9 CHAIRMAN SKILLMAN: Okay. We are on page
10 3 of 1.79.1.

11 MR. TALBOT: Okay.

12 CHAIRMAN SKILLMAN: Yes, let's don't try
13 to do real-time for 1.79.1.

14 MR. TALBOT: Okay.

15 CHAIRMAN SKILLMAN: Let's just ask you to
16 compare the two and ensure that the comments made on
17 one are applied also to the other.

18 MR. TALBOT: Applied to the other. I will
19 just make that as a separate comment.

20 CHAIRMAN SKILLMAN: Okay. We are on page
21 3. Any comments, please, on 1.79.1, page 3?

22 MEMBER SHACK: Well, there is that
23 peculiar sentence on page 3, right?

24 CHAIRMAN SKILLMAN: And vice versa.

25 MR. TALBOT: Okay.

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1 CHAIRMAN SKILLMAN: Good. Thank you,
2 Frank.

3 MR. TALBOT: Okay. We are on page?

4 CHAIRMAN SKILLMAN: On page 3. Comments,
5 please?

6 MEMBER SHACK: Yes, there is a sentence
7 just before the system testing header.

8 MR. TALBOT: Okay. I think I am where you
9 want me to be.

10 MEMBER SHACK: Right. I am just not sure
11 what it means that "This testing should be performed
12 under the most limiting design basis conditions and
13 may be verified by either testing or analyses." I
14 would have just stopped at "conditions". So, it is a
15 little unclear exactly what it means.

16 MR. TALBOT: Got it.

17 CHAIRMAN SKILLMAN: Other comments on page
18 3, please?

19 (No response.)

20 Page 4?

21 CONSULTANT WALLIS: Well, there is the
22 matter of verifying that water hammer does not occur.
23 I don't know how you would do that.

24 MR. TALBOT: I am trying to remember --

25 CONSULTANT WALLIS: Did that come from

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1 some other member of the staff or something?

2 MS. KAVANAGH: Where exactly are you on
3 page 3?

4 CHAIRMAN SKILLMAN: Page 4. He is at No.
5 4.

6 CONSULTANT WALLIS: F(4).

7 MR. TALBOT: Again, let me focus here.

8 CHAIRMAN SKILLMAN: I think Dr. Wallis'
9 question is, how do you do that? Did you hear a bang
10 in the control room or do you have acoustical
11 monitors? How do you do that?

12 MEMBER REMPE: Well, hopefully, there is
13 a document somewhere that explicitly discusses this.

14 CHAIRMAN SKILLMAN: Well, the real problem
15 is water hammer can be as subtle as a little thud --

16 MEMBER REMPE: But he was saying --

17 CHAIRMAN SKILLMAN: -- or it can rip a
18 pipe in a heat exchanger off of a wall. I mean, it
19 can really be violent.

20 MEMBER REMPE: So, has no one ever tried
21 to document the exact test and what is acceptable and
22 not acceptable on this?

23 MEMBER SHACK: Well, I think if you have
24 the keep-filling venting components working, you won't
25 get a water hammer.

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1 CONSULTANT WALLIS: Well, maybe you should
2 take that out, that water hammer doesn't occur. Then,
3 in the next sentence, "Verify proper" --

4 MR. TALBOT: Yes.

5 CONSULTANT WALLIS: "To prevent water
6 damage," or something, and then say something about
7 inspection. What do you do if there is damage or
8 something?

9 MR. TALBOT: "Verify proper operation of
10 key venting components to prevent" --

11 MEMBER SHACK: Well, if there is damage,
12 that is a different problem. You are out of the pre-
13 operational testing business.

14 (Laughter.)

15 CHAIRMAN SKILLMAN: You are in repair.

16 CONSULTANT WALLIS: What do you do if
17 there is a water hammer?

18 MR. TALBOT: What do you do? You are not
19 going to be operating that system.

20 CONSULTANT WALLIS: No, it might be a very
21 mild water hammer.

22 MR. TALBOT: Huh?

23 CONSULTANT WALLIS: It might be nothing at
24 all.

25 CHAIRMAN SKILLMAN: I guess the reason

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1 that I am agreeing with Dr. Wallis here is because
2 water hammer can be as subtle as just a rumble,
3 "blump, blump" rumble. And it kind of sounds like
4 maybe the pump hiccuped or there was a hunk of gas
5 going through the pump. Or it can be an actual
6 mechanical shock --

7 MR. TALBOT: Oh, yes.

8 CHAIRMAN SKILLMAN: -- where you actually
9 see the pipe hangers move. And there can be a lot in
10 between. So, when the Regulatory Guide says, "Verify
11 water hammer didn't happen" or "Communicate that water
12 hammer did occur," then that either requires there to
13 be acoustical monitoring or displacement monitoring on
14 piping, or something like that. If that is what you
15 intend, you need to write that. If that is not what
16 you intend, you need to write something different.
17 But if you are going to tell the industry, "Hey,
18 verify water hammer didn't happen," then industry is
19 going to say, "Okay, how am I going to do that?"

20 MR. TALBOT: Okay. This is what I have
21 placed in here. "How do you do that? Do you use
22 acoustic monitors to check water hammers during the
23 test? Do you use displacement monitoring devices on
24 a PCF?"

25 CONSULTANT WALLIS: You want them to do

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1 that?

2 MR. TALBOT: Pardon?

3 CONSULTANT WALLIS: You really want them
4 to do that?

5 CHAIRMAN SKILLMAN: You are just raising
6 the question?

7 MR. TALBOT: Just raising the question.
8 I have got to do some research to find out if this is
9 appropriate information to add to the Reg. I might
10 find it in the ASME code.

11 MEMBER SCHULTZ: Frank, could you just do
12 me a favor and yellow-in the phrase in the sentence
13 before there where it says, "And that water hammer
14 does not occur."? I would really expect that to be
15 removed, that phrase, and that water hammer does not
16 occur. Do you see? It is right above where your
17 cursor is.

18 Oh, that is what we are saying; you can't
19 expect that to be done. Maybe ASME has a way to do
20 it, but to definitely demonstrate that, I don't see
21 how it is possible.

22 CHAIRMAN SKILLMAN: Yes, the real
23 challenge here is that water hammer can occur under
24 cold conditions. It doesn't necessarily have to be
25 high temperature. It can be just vapor pressure with

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1 enough of a void in order to get a slug that causes
2 the impact.

3 MR. TALBOT: I put, "You should consider
4 deleting this," highlighted, for the yellow portion.

5 MEMBER SCHULTZ: That is fine. Thank you.

6 CHAIRMAN SKILLMAN: That is fine.

7 Okay, Team, any other comments, please, on
8 this?

9 (No response.)

10 I want to bring your attention, please, to
11 E, "echo", "Verify system NPSH requirements." Do you
12 mean system or pump?

13 I'm sorry, I am still on page 4. You have
14 gone to page 7. Let's go back to page 4. Page 4 at
15 Item "Echo".

16 MR. TALBOT: "Verify system or pump."

17 CHAIRMAN SKILLMAN: Yes, what are you
18 talking about?

19 MEMBER SCHULTZ: I think it is pump.

20 CHAIRMAN SKILLMAN: Yes, I think you are
21 talking about pump and PSH requirements, not system.

22 MR. TALBOT: Not system; I agree.

23 CHAIRMAN SKILLMAN: I believe you mean
24 pump.

25 Thank you.

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1 MEMBER SCHULTZ: But, just following that
2 through to the end of the sentence, "through the
3 following tests," and what tests are those?

4 CONSULTANT WALLIS: Yes, what are those
5 tests? Right?

6 CHAIRMAN SKILLMAN: Did you read the whole
7 sentence there under --

8 MR. TALBOT: Yes, I see it. I see it.

9 CHAIRMAN SKILLMAN: Yes. Which tests? I
10 am guessing that sentence comes from another document.

11 MR. TALBOT: I will have to go back. I am
12 going to take a look at the DCD to see if something
13 was missed.

14 CHAIRMAN SKILLMAN: Yes. What tests?

15 MEMBER SCHULTZ: Maybe we just put a
16 couple of question marks.

17 CHAIRMAN SKILLMAN: Thank you.

18 MR. TALBOT: Got it. Okay.

19 CHAIRMAN SKILLMAN: Okay. Now we are on
20 page 5. Comments?

21 CONSULTANT WALLIS: Well, the first line,
22 in the other Reg. Guide, when you were looking at
23 vibration levels and piping movement, you cited an
24 ASME procedure of some sort?

25 MR. TALBOT: Yes, ASME Section --

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1 CONSULTANT WALLIS: And you have got it in
2 this place, too?

3 MR. TALBOT: It is in component testing at
4 the end.

5 CONSULTANT WALLIS: Oh, it is in this
6 guide, too?

7 MR. TALBOT: Yes, sir.

8 CONSULTANT WALLIS: Well, can you give a
9 pointer or something? Do you have to wait until they
10 get there to find out?

11 MR. TALBOT: Which item? And I could say,
12 "See C.2." -- let me get the number.

13 CONSULTANT WALLIS: It is in here again
14 somewhere?

15 MR. TALBOT: Yes, sir.

16 CONSULTANT WALLIS: What page is it?

17 MR. TALBOT: I am going to get there.
18 Just give me one sec. It is at the end, C.2.f, System
19 Piping and Supports.

20 CONSULTANT WALLIS: Give me a page number.

21 MR. TALBOT: It is page 14, I believe.

22 CONSULTANT WALLIS: Fourteen?

23 MR. TALBOT: This one shows it on 15, but
24 since we have been adding comments, it has pushed
25 things down.

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1 CHAIRMAN SKILLMAN: Fourteen on your copy,
2 Graham.

3 MR. TALBOT: Yes, on the hard copy.

4 CONSULTANT WALLIS: It is on page 14?

5 MR. TALBOT: Yes, sir.

6 CONSULTANT WALLIS: So, why do you put it
7 there and not on page 5?

8 MR. TALBOT: Okay. And which item is it
9 that you seek the reference to?

10 MEMBER REMPE: It is "i" or --

11 CONSULTANT WALLIS: Well, in "f" you have
12 exactly the same sentence. "Verify in terms of full
13 motor vibration levels," and so on and so on, and then
14 you say how to do it on page 14. On page 5, you have
15 exactly the same sentence, and you don't say how to do
16 it.

17 MEMBER REMPE: So, you need to find the
18 system testing section, which started on page 3 and,
19 then, it ends on page 5 on my version, which is
20 different than yours now. And there is an Item i that
21 talks about acceptable pump and motor vibration levels
22 and system piping movement.

23 I think you are on page 8, which is
24 probably too far down. You need to go back up to like
25 around page 5.

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1 MEMBER SHACK: Yes, it is just before the
2 automatic depressurization system.

3 MEMBER REMPE: Yes. There, you got it.

4 MEMBER SHACK: Yes, Item i.

5 MEMBER REMPE: Item i.

6 CONSULTANT WALLIS: Item i at the very
7 top.

8 MR. TALBOT: Got it.

9 CONSULTANT WALLIS: Okay.

10 MEMBER SCHULTZ: Is that where we wanted
11 to go, 1.79, or did we want to go to the AMC
12 pressurized test reference? Just in piping movements,
13 vibrations?

14 CONSULTANT WALLIS: Well, I don't
15 understand this reference system. It is on page 14
16 and it has got a little "f" there.

17 MEMBER SCHULTZ: Yes, that is where I
18 thought we were going, Frank.

19 MR. TALBOT: Like that?

20 MEMBER SCHULTZ: Yes.

21 MEMBER SHACK: Well, it is probably
22 shorter to reference the C.2, too.

23 MEMBER SCHULTZ: Frank can figure that one
24 out, I guess.

25 MR. TALBOT: Yes, I will figure it out.

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1 MEMBER SCHULTZ: It is four places in two
2 documents.

3 MR. TALBOT: Okay.

4 CHAIRMAN SKILLMAN: Thank you.

5 Any other comments, please, on page 5?

6 (No response.)

7 Page 6?

8 CONSULTANT WALLIS: Well, here you have
9 got this "Verify system pipe movements" again. It is
10 a recurring theme here.

11 MR. TALBOT: The same comment, right?

12 CONSULTANT WALLIS: Yes, I guess so.
13 Figure out how to handle it.

14 MR. TALBOT: Where do you see it again,
15 sir?

16 CONSULTANT WALLIS: It is little "e", page
17 6.

18 CHAIRMAN SKILLMAN: Page 6, "echo," right
19 in the middle of the page. There you go, "e".

20 CONSULTANT WALLIS: And on "d".

21 MR. TALBOT: Got it.

22 CONSULTANT WALLIS: On "d", the one above
23 that --

24 MR. TALBOT: Uh-hum.

25 CONSULTANT WALLIS: -- you say, "Verify

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1 pump NPSH under limited design flow conditions." Does
2 that mean that they have to set up the limited design
3 flow conditions in a test?

4 MEMBER SHACK: No, it means, because they
5 are running with a temporary steam supply, they just
6 can't get the RCIC up very --

7 CONSULTANT WALLIS: Well, explain it.

8 MEMBER SHACK: Well, it is sort of up
9 there in Item 1.

10 MEMBER SCHULTZ: Yes, there is a long
11 description of it there.

12 MEMBER SHACK: That is sort of why tells
13 you you may have to do some more in the power
14 extension test.

15 CONSULTANT WALLIS: Does 1 say that?

16 MR. TALBOT: And that is true. You have
17 an aux boiler on the ABWR plant that would do -- we
18 have to verify, is this pre-op?

19 MEMBER SHACK: Yes, I assume this is all
20 pre-op.

21 CHAIRMAN SKILLMAN: Yes, this is all pre-
22 op.

23 MR. TALBOT: Yes. See, there is another
24 low-power ascension test below for RCIC, but during
25 the pre-op test phase, it would be run under aux

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1 boiler conditions.

2 And I think it does say it in the first
3 paragraph. "This test should be performed using
4 temporary steam supply, e.g., aux boiler.

5 CONSULTANT WALLIS: Does that mean that
6 they have to run it under limited design flow
7 conditions?

8 MEMBER SCHULTZ: Anyway, it says in line
9 7 that the pump flow may be limited.

10 MR. TALBOT: I would think that -- yes,
11 the aux boiler usually only gets you up to like --
12 what? -- maybe 150 psig steam; whereas, when you are
13 under normal power operation for an ABWR, you are at
14 1,000 psig. So, it makes a big difference.

15 CONSULTANT WALLIS: So, how do you do
16 this? Then, you could have verified by analysis, by
17 extrapolation, or something? How do you verify NPSH
18 under limited design flow conditions?

19 MEMBER SHACK: Why don't you take the
20 design out of the limited design flow and just make it
21 under limited flow conditions, which is what you have?

22 CONSULTANT WALLIS: What does that mean?
23 What does that mean?

24 MEMBER SHACK: Well, it is just that the
25 flow isn't up to the design level.

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1 CONSULTANT WALLIS: So? What are they
2 supposed to do? Are they supposed to extrapolate by
3 analysis?

4 MEMBER SHACK: Well, that is why he does
5 additional testing.

6 MR. TALBOT: Pump curves have that, don't
7 they?

8 CONSULTANT WALLIS: Well, but it is just
9 the wording doesn't tell me I have to go and do
10 analysis to extrapolate the NPSH in some way. The
11 impression I got is that you have to do the tests
12 under the limiting conditions, but that is not what
13 you mean? Because you can't do the tests under
14 limiting conditions because pump flow is limited,
15 right?

16 What do you mean by "limited" here? You
17 use "limited" to imply that you can't do it up to the
18 realistic condition.

19 MR. TALBOT: True.

20 CONSULTANT WALLIS: So, now you want it to
21 be verified under the realistic condition?

22 MR. TALBOT: My feeling is, based on
23 comments that I have heard so far, that I think this
24 should probably reflect limiting conditions under pre-
25 op testing where you are using an aux boiler to run

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1 the RCIC.

2 CONSULTANT WALLIS: But how does that
3 verify that it will work under the real flow
4 conditions?

5 MR. TALBOT: I would say that I would look
6 at my pump curves, and those pump curves start out at
7 the lower pressure, then go all the way up to the full
8 pressure. And I think the pump curves could
9 extrapolate up to the full pressure.

10 CONSULTANT WALLIS: But that doesn't come
11 from the wording that you have got here.

12 MR. TALBOT: No, it doesn't.

13 CONSULTANT WALLIS: Maybe you need to say
14 that in some way.

15 MR. TALBOT: Yes.

16 I wrote this in here: "Please explain
17 what the limiting design conditions, what is meant by
18 limiting design flow conditions."

19 CONSULTANT WALLIS: I don't know what that
20 means. You see --

21 MR. TALBOT: It could be done by analysis,
22 by the limiting conditions related to the use of an
23 aux boiler.

24 CONSULTANT WALLIS: Well, in the real
25 conditions, you have screen debris losses as well,

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1 which you don't have in the pre-operational tests.

2 MR. TALBOT: Do you extrapolate from hump
3 curves?

4 CONSULTANT WALLIS: I don't know what you
5 are supposed to do. Is your objective to show that
6 RCIC will work during an accident?

7 MR. TALBOT: Yes.

8 CONSULTANT WALLIS: Well, then, you have
9 to somehow get to accident conditions, either
10 analytical or experimentally?

11 MR. TALBOT: Yes, and there is another
12 test under low-power test conditions, which would be
13 the full-pressure conditions of the plant, which would
14 get you the other part of the answer that I think you
15 are seeking.

16 CONSULTANT WALLIS: Well, how about the
17 screen losses in the real plant?

18 MR. TALBOT: The suction screens in the
19 suppression pool?

20 CONSULTANT WALLIS: Yes. If you look at
21 figure A-5, you have got a suppression pool which is
22 below the pump. The pump is up in the air, and you
23 have got a screen. So, in the real condition you have
24 got hotter water than you probably did in your cold
25 test and you have got a screen. You have got things

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1 which are going to make NPSH worse. Are they supposed
2 to do that analysis?

3 MR. TALBOT: "Do you take into account
4 head loss from the suction strainers, from the suction
5 strainer screens in the suppression pool?"

6 CONSULTANT WALLIS: The maximum
7 suppression pool temperature.

8 I don't really care about all the words
9 you use, but your intent here is that they do a cold
10 test.

11 MR. TALBOT: Uh-hum.

12 CONSULTANT WALLIS: And then, somehow they
13 use the results to predict what would happen under the
14 most severe accident conditions. Isn't that what you
15 want them to do?

16 MR. TALBOT: I am not sure if they heat up
17 the pool.

18 CONSULTANT WALLIS: Do you want them to
19 heat up the pool?

20 MS. KAVANAGH: Frank, let's take that
21 back.

22 CONSULTANT WALLIS: Maybe you need to
23 think about it.

24 MR. TALBOT: Yes.

25 CONSULTANT WALLIS: Yes.

1 CHAIRMAN SKILLMAN: Okay. Let's keep on
2 going.

3 CONSULTANT BONACA: One thing that
4 concerns me is such a long list of clarification, that
5 I am wondering if I am missing something. I can't
6 tell if it is a complete set.

7 CHAIRMAN SKILLMAN: Okay. And where are
8 you, Mario, please?

9 CONSULTANT BONACA: Oh, the reactor core
10 and selection cooling.

11 MEMBER SCHULTZ: A through i.

12 CONSULTANT BONACA: It is something that
13 you mentioned.

14 MR. TALBOT: I am missing Mario's
15 question. What is he --

16 CONSULTANT BONACA: Yes, my concern is
17 that, when you have such a long list of verify,
18 verify, verify, verify, okay, the guy who is reading
19 it looks at it, you know --

20 MEMBER SCHULTZ: It is repetitive.

21 CONSULTANT BONACA: Yes, I mean, a
22 complete set is going to be --

23 MEMBER SCHULTZ: Is this the complete
24 listing?

25 CONSULTANT BONACA: Yes.

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1 CHAIRMAN SKILLMAN: How do you know it is
2 complete, of all the things that need to be done? For
3 the ABWR for RCIC, how do you know this is a
4 complete --

5 MEMBER SCHULTZ: It is guidance. It is
6 Reg. guidance.

7 CHAIRMAN SKILLMAN: -- for comprehensive
8 treatment of this topic? Is it all there?

9 MR. TALBOT: For this one, I can double-
10 check again against the ABWR RCIC DCD 14.2 test to
11 confirm that I have captured everything.

12 CHAIRMAN SKILLMAN: All of it. Okay.

13 MEMBER SHACK: That is certainly the
14 intent.

15 CHAIRMAN SKILLMAN: So, that was Dr.
16 Bonaca's question: how do you know it is all here?

17 MR. TALBOT: "Please confirm that" --

18 CHAIRMAN SKILLMAN: Confirm it is all
19 here.

20 MR. TALBOT: -- "you have captured all
21 required RCIC testing in DCD 14."

22 Does that capture the essence?

23 CHAIRMAN SKILLMAN: Yes.

24 Mario, are you done?

25 CONSULTANT BONACA: Yes.

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1 MR. TALBOT: "Please confirm that you have
2 captured all the RCIC testing" -- huh?

3 MEMBER SHACK: You might take a look at
4 1.79 under the low-pressure safety injection, Item b,
5 where they talk about the postulated effect of debris
6 has to be considered when evaluating test results,
7 because test results can differ. So, you addressed it
8 back in the PWR case. It somehow didn't get
9 addressed --

10 MR. TALBOT: In the BWR case?

11 MEMBER SHACK: In the BWR case.

12 MR. TALBOT: And say this one more time?

13 MEMBER SHACK: It is low-pressure
14 safety -- well, let me just give you the page number.

15 MR. TALBOT: Okay.

16 MEMBER SHACK: Page 5.

17 MR. TALBOT: Okay.

18 MEMBER SHACK: And you can sort of see
19 there is a discussion there about how to correct for
20 the changes in conditions and add the postulated
21 thing, which sort of needs to --

22 MR. TALBOT: Is this for high-pressure
23 core flutter?

24 MEMBER SHACK: Well, it is low-pressure
25 safety injection in this, but it is the same

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1 problem --

2 MR. TALBOT: Right.

3 MEMBER SHACK: -- you are running back
4 into in the BWR case where you have to --

5 MEMBER SCHULTZ: Bill is looking at
6 1.79 --

7 MR. TALBOT: Oh.

8 MEMBER SCHULTZ: -- and saying there are
9 words in there that you might find helpful.

10 MEMBER SHACK: Well, there are words in
11 1.79 that you might find helpful to what you are doing
12 in 1.79.1, where you --

13 MR. TALBOT: For RCIC?

14 MEMBER SHACK: Well, for all these systems
15 where you have to talk about the debris generation and
16 the effect on NPSH.

17 MR. TALBOT: Okay. I am wondering where
18 I should put this. I am going to go look at 1.79
19 related to NPSH and debris.

20 MEMBER SHACK: Yes, look at page 5 of
21 1.79.

22 MR. TALBOT: And is your comment there
23 already? Let me search for the word "debris". Okay,
24 here is one place.

25 CHAIRMAN SKILLMAN: Is that the first

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1 instance? On page 14 of 37, is that what you are
2 coming up with here?

3 MR. TALBOT: Yes. Well, that is under
4 pumps and motors. So, that is not the first instance.

5 MEMBER SHACK: No, it should be back on
6 page 5. I am not sure why it is not showing up.

7 MR. TALBOT: And it is showing up near the
8 end, and I know it is on page 5, too. Probably
9 because I didn't search from the top of the document.

10 MEMBER SHACK: Yes. It is easier in PDFs,
11 where they don't really like that sort of thing.

12 MS. KAVANAGH: You guys are on two
13 different documents.

14 MEMBER SHACK: Oh, he is in 1.79.1?

15 MR. TALBOT: I am in 1.79.1, and the
16 comment is "Incorporate the debris issue related
17 to" --

18 MEMBER SHACK: Well, not "incorporate".
19 At least look at what you wrote about debris.

20 CHAIRMAN SKILLMAN: "Address," yes.

21 MEMBER SHACK: "Address."

22 CHAIRMAN SKILLMAN: Address it for 1.79.

23 MEMBER SHACK: You addressed it in 1.79;
24 you want to sort of use --

25 MR. TALBOT: But not in 1.79.1.

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1 MEMBER SHACK: -- the same thing in
2 1.79.1.

3 MR. TALBOT: And the water hammer debris.

4 MS. KAVANAGH: Frank, you are not there.

5 MEMBER SHACK: You are in the wrong
6 document.

7 MR. TALBOT: I am in 1.79.1.

8 MEMBER SHACK: Right.

9 MS. KAVANAGH: And he is referring to
10 1.79, page 5.

11 MR. TALBOT: Okay, because it is not in
12 here at all.

13 MEMBER SHACK: Right. Exactly.

14 MR. TALBOT: Okay. Let me do this. I am
15 going to put it up at the top.

16 CHAIRMAN SKILLMAN: Just make a comment
17 anywhere --

18 MEMBER SHACK: Right.

19 CHAIRMAN SKILLMAN: -- and say, "Refer to
20 1.79 comment regarding debris."

21 MR. TALBOT: I am going to do it for the
22 entire section.

23 MEMBER SHACK: An adjustment of tests
24 between test conditions and real-world or design
25 conditions.

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1 CHAIRMAN SKILLMAN: Yes.

2 MR. TALBOT: Okay.

3 CHAIRMAN SKILLMAN: Good.

4 MR. TALBOT: "Review Reg. Guide 1.79 to
5 incorporate guidance on testing for the debris issue
6 and add to Reg. Guide 1.79.1." Okay.

7 CONSULTANT WALLIS: Can we go back to page
8 6 now?

9 MR. TALBOT: Page 6?

10 CONSULTANT WALLIS: I am puzzled by page
11 6. It looks as if something got mixed up in what you
12 are trying to say. Go right back to 1, and these a,
13 b, c, d's are sub-bullets referring to 1 at the top of
14 the page.

15 "The purpose of the pre-operative list is
16 to test the signals to automatically start the reactor
17 core isolation system and the signal for automatic
18 isolation of the RCIC system at low steam pressure."

19 If the purpose of the test is only to test
20 signals, and yet you have got this "d" on NPSH and "e"
21 on vibration levels, and all this other stuff, it
22 doesn't have anything to do with testing signals. And
23 I don't see a sub-bullet which says how you test the
24 signal for automatic isolation at low steam pressure.
25 It looks as though the sub-bullets refer to some other

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1 more comprehensive tests.

2 MR. TALBOT: I am not sure where he is.

3 MEMBER SHACK: Well, he is looking at the
4 first sentence up in paragraph 1.

5 MS. KAVANAGH: Under RCIC.

6 MEMBER SHACK: Under RCIC.

7 MR. TALBOT: Okay.

8 MEMBER SHACK: The other direction.

9 MS. KAVANAGH: The first sentence.

10 MR. TALBOT: This first sentence?

11 CONSULTANT WALLIS: It only refers to
12 signals. This is a whole new section, isn't it, in
13 the guide, this time? So, it may be best to spend
14 time on it.

15 MR. TALBOT: This is a pre-op test. So,
16 are we thinking simulated signals?

17 MEMBER RYAN: Could you show all the
18 sentence? I have got a confusion point. Maybe it
19 will help to say it. "The purpose of this test is to
20 test the signals to automatically start the reactor."

21 CONSULTANT WALLIS: Core isolation
22 cooling.

23 MEMBER RYAN: What does that actually
24 mean? It is a pre-operational test to see if signals,
25 when applied to something, automatically start the

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1 reactor, right?

2 MR. TALBOT: Start the RCIC pump.

3 MEMBER RYAN: Well, you know, you are
4 testing to see if a signal is actuated and starts a
5 piece of machinery.

6 MEMBER SHACK: Yes.

7 MEMBER RYAN: So, you can't test the
8 signal to automatically start the reactor. You either
9 automatically start it or you don't. And you are not
10 starting the reactor in what you just said; it is the
11 RCIC pump.

12 MR. TALBOT: You are not starting the RCIC
13 pump, yes. You are talking about simulated signals.

14 MEMBER SHACK: Well, no, it is to test the
15 automatic start of the RCIC at low water level or high
16 drywell pressure.

17 MEMBER RYAN: And forget about the reactor
18 words.

19 MR. TALBOT: Right. I understand.

20 MEMBER RYAN: Okay. I mean, just it is
21 very confusing the way it is written, and I don't know
22 what you are trying to start.

23 MEMBER SHACK: To test the signals is the
24 one that is sort of confusing.

25 CONSULTANT WALLIS: But, then, within the

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1 sub-bullets, they don't say much about signals. So,
2 it is all mixed up somehow.

3 MEMBER SHACK: Well, they do test the
4 automatic start.

5 MEMBER RYAN: I wonder if that paragraph
6 is complete.

7 MEMBER SHACK: It is the automatic start
8 that you are really worried about.

9 MEMBER REMPE: The paragraph is a bit
10 confusing because you talk about a single test, and
11 then, later on, you start talking about multiple
12 tests.

13 MEMBER SCHULTZ: Yes, all of that.

14 CONSULTANT WALLIS: All kinds of stuff.

15 MEMBER REMPE: Maybe there is something
16 missing in the logic.

17 CONSULTANT WALLIS: There is something
18 missing.

19 MEMBER REMPE: Something got changed.

20 MEMBER RYAN: I get the impression this
21 was cut and pasted from something else.

22 MEMBER SHACK: No, it isn't.

23 MEMBER RYAN: No?

24 MEMBER REMPE: But there is a pre-
25 operational test in the first sentence, but, then, the

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1 second-from-the-last sentence talks about a bunch of
2 tests.

3 MEMBER SHACK: This is a brand-new
4 creation, right?

5 MEMBER SCHULTZ: It is a new creation.

6 MR. TALBOT: Excuse me?

7 MEMBER REMPE: The first sentence talks
8 about a pre-operational test. But if I go to the
9 second-from-the-last -- in fact, the last two
10 sentences, they are talking about pre-operational
11 tests. When did we go from one test to multiple
12 tests?

13 MS. KAVANAGH: I understand your comment.
14 We will address it.

15 MEMBER REMPE: And the last sentence is
16 particularly confusing because these tests should be
17 performed to demonstrate the following tests --

18 MR. TALBOT: Okay. You are talking about
19 the singular-versus-plural issue?

20 MEMBER REMPE: That is one issue.

21 MR. TALBOT: It starts out with the long
22 logic. It says, "This test," "the purpose of this
23 pre-op test." It is really "The purpose of these pre-
24 operational tests," and these tests should be
25 performed.

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1 MEMBER RYAN: I think it is a little
2 different.

3 CONSULTANT WALLIS: For many more
4 purposes.

5 MEMBER RYAN: If you read it out loud,
6 "These tests should be performed using RCIC system
7 design specifications to demonstrate the tests." A
8 test is used to demonstrate tests; that doesn't make
9 sense.

10 MS. KAVANAGH: We will address it.

11 MR. TALBOT: Yes. Understand.

12 MEMBER SCHULTZ: I think there is a
13 sentence missing in the paragraph that connects the
14 two together to the number of tests that are described
15 down below.

16 MEMBER RYAN: Yes. I mean, it would be
17 helpful if there was kind of some more. There are
18 five tests, one through five, 1X, 2Y, 3Z, and so on.
19 Just lay it out, you know, real mechanically and it
20 will be clearer.

21 MS. KAVANAGH: Frank, I would recommend
22 just take the comment. Don't try to fix it now.

23 MR. TALBOT: Okay. Got it.

24 MEMBER REMPE: And be sure to fix the last
25 sentence because you are introducing verifying the

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1 operation of certain things, not demonstrate the
2 following tests.

3 MR. TALBOT: Uh-hum.

4 CONSULTANT WALLIS: Well, I think you have
5 got to be clear on what the purpose of all these tests
6 is, and it is not captured at all in paragraph 1.

7 MS. KAVANAGH: I understand your comment.

8 MR. TALBOT: Yes.

9 CONSULTANT WALLIS: And then, when you get
10 on the next page, you have got two where the purpose,
11 again, is to --

12 MS. KAVANAGH: Right.

13 CONSULTANT WALLIS: -- verify preparation
14 of the RCIC system. Now what is the difference
15 between one and two, except one is cold and one is
16 hot? I don't see how they fit together. Why are you
17 testing NPSH to the cold system and not testing it
18 with the hot system? It doesn't make sense. So, I
19 think the whole RCIC thing needs to be rethought in
20 the way you lay out.

21 MR. TALBOT: Okay.

22 CONSULTANT WALLIS: Are you going to come
23 back to us with a rewritten RCIC section?

24 MS. KAVANAGH: I'm sorry?

25 CONSULTANT WALLIS: This whole RCIC

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1 section looks as if it needs to be reorganized in a
2 more logical way and explaining why the subtests
3 relate to the overall purpose, and so on. Are you
4 going to come back to us with something?

5 MS. KAVANAGH: We can do that.

6 MEMBER SHACK: Yes, that is our decision.

7 CONSULTANT WALLIS: It is, yes, but --

8 MS. KAVANAGH: I would think at this point
9 you would like to see how we address all your
10 comments.

11 CHAIRMAN SKILLMAN: Correct.

12 Okay, we are on page 6. We are at four
13 o'clock, 1600. We need to move along. You are on 7
14 now.

15 Somehow we have added a page in this. I
16 am not quite sure. What you have as 8, we have as 7.

17 MR. TALBOT: Because of the comments, it
18 did push down stuff a page.

19 CHAIRMAN SKILLMAN: Yes. Okay.

20 MR. TALBOT: I have got this here, so I
21 can get to where you want to go.

22 CHAIRMAN SKILLMAN: So, any comments under
23 low-power flow test hot conditions? That was our old
24 page 7, now page 8. Graham or Mario?

25 CONSULTANT WALLIS: Yes, I don't see how

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1 that is different from the -- I think some of the
2 things you are trying to do in the cold tests would
3 fit better in the hot tests, like NPSH, for instance.
4 So, I think you need to rethink that.

5 MR. TALBOT: Uh-hum.

6 MEMBER SHACK: Although, remember, you
7 have a lot more access to the system in the cold test
8 than you do the hot test.

9 CHAIRMAN SKILLMAN: So, what we want to
10 say here, I think, is, "For the low-power flow test
11 hot conditions, refer to the comments in the cold
12 conditions and carry over as appropriate," because
13 some of the comments apply to both.

14 MEMBER RYAN: Okay. I think, to me, the
15 hot and the cold sections, there are going to be
16 places where things seem to align and are the same,
17 and there are things that are different and should be
18 differentiated. And that is really the comment I am
19 taking away from what we have gone through, is that
20 there are things that need to be recognized as being
21 the same. So, that is maybe section, you know, hot A
22 and B. Just kind of organize it and tell people you
23 are laying it out in this way, so you can see what is
24 happening in one sort of test versus the other, and
25 laying it out that way. Because it is not clear, when

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1 you just read it, that there is any sense of
2 alignment, at least to me.

3 Does that make any sense?

4 CHAIRMAN SKILLMAN: Yes.

5 So, Frank, I think you are really hearing
6 us offer the comment there is some organization effort
7 that needs to be invested here to get these two pieces
8 aligned, hot and cold, RCIC.

9 MR. TALBOT: RCIC is what, C? Okay.

10 CHAIRMAN SKILLMAN: Okay. Any other
11 comments on our old page 7, the new page 8?

12 (No response.)

13 Hearing none, our old page 8 that is the
14 new page 9, Gravity-Driven ESPWR.

15 CONSULTANT WALLIS: Yes.

16 CHAIRMAN SKILLMAN: Graham, go ahead.

17 CONSULTANT WALLIS: On the D.1.d --

18 CHAIRMAN SKILLMAN: D.1.della, okay.

19 CONSULTANT WALLIS: -- they have got a
20 gravity-driven cooling system, is the "d", and then it
21 goes to (1) and then there is a subsection "d" right
22 there.

23 MR. TALBOT: Uh-hum.

24 CONSULTANT WALLIS: "Verify the flow from
25 the suppression pool through the reactor vessel is not

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1 obstructed." What do you mean by that?

2 MR. TALBOT: In this particular case, I am
3 thinking of debris that somehow got into the pool.

4 CONSULTANT WALLIS: Well, suppose you have
5 some diapers in there.

6 MR. TALBOT: Yes.

7 CONSULTANT WALLIS: Yes? How do you know
8 that it is obstructed? Do you measure flow rate and
9 pressure drop? And if the diapers don't have any
10 effect, can you leave them in there? Do you actually
11 send something down there to see if there is an
12 obstruction in the way?

13 MEMBER RYAN: The simple way to say that,
14 just say the flow is unobstructed and at the
15 appropriate flow rate.

16 CONSULTANT WALLIS: By measuring the flow
17 rate. What you want to do is make sure the flow rate
18 is achieved.

19 MEMBER RYAN: Yes.

20 CONSULTANT WALLIS: Obstruction is --

21 MEMBER RYAN: Well, the flow rate will
22 tell you whether there is an obstruction or not, based
23 on how much flow gets through.

24 CONSULTANT WALLIS: Well, it won't tell
25 you whether it is sufficiently obstructed to affect

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1 the flow.

2 MEMBER RYAN: Well, right.

3 CONSULTANT WALLIS: It won't tell you if
4 there is an obstruction in there, such as a diaper
5 laying on the floor --

6 MEMBER RYAN: Fair enough.

7 CONSULTANT WALLIS: -- that doesn't do
8 anything.

9 MEMBER RYAN: So, really, the criteria is
10 an obstruction.

11 CONSULTANT WALLIS: So, are you looking
12 for flow rate or are you looking for some gizmo that
13 goes in there and looks for obstruction?

14 MEMBER REMPE: This is for the ESBWR. So,
15 again, isn't there some sort of design acceptance
16 criteria that they should have for that flow rate --

17 CONSULTANT WALLIS: There are, yes.

18 MEMBER REMPE: -- along with a lot of
19 other vague terms in this section, like what is
20 significant steam leakage --

21 CONSULTANT WALLIS: Right.

22 MEMBER REMPE: -- to the atmosphere, and
23 there was, again, sufficient data. And again, maybe
24 the answer is, could we have a pointer to say what
25 these vague terms mean?

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1 MEMBER SCHULTZ: Well, I mean, I am
2 guessing that in the design criteria documentation
3 they may have used the word, you know, test the flow
4 to make sure that there is no obstruction.

5 MEMBER REMPE: But they don't say what is
6 an appropriate --

7 MEMBER SCHULTZ: Now we summarize it here,
8 and it comes out it a little differently.

9 MEMBER REMPE: Yes.

10 MEMBER SCHULTZ: And it looks like they
11 are trying to validate there is no obstruction. And
12 the next "e" is the same. This is within the pre-
13 operational flow test. You are testing flow rate, and
14 that is demonstrating -- you don't have
15 instructions -- but you are not assuring that every
16 passage is unobstructed.

17 MEMBER REMPE: Isn't there some place
18 where they say a value needs to be greater than or
19 equal to "X"??

20 MEMBER SCHULTZ: I am sure that is what it
21 is.

22 MEMBER REMPE: And that is in the design
23 certification?

24 MEMBER SCHULTZ: Uh-hum.

25 MEMBER REMPE: The DAC?

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1 MEMBER SCHULTZ: That is what I am saying;
2 they may have said, "We are doing this test to make
3 sure that we don't have obstructions that we don't
4 want to have." If we summarize it that way, it looks
5 like we are expecting the test is going to validate
6 that there are no obstructions. That is a different
7 thing.

8 MEMBER REMPE: So, what you are saying is
9 they should --

10 MEMBER SCHULTZ: Go back and make sure
11 that we have got the language right.

12 CONSULTANT WALLIS: Are you testing flow
13 rate or obstruction?

14 MEMBER SCHULTZ: I think we are testing
15 flow.

16 MEMBER REMPE: Well, flow rate --

17 MEMBER SCHULTZ: Yes, flow rate.

18 MEMBER REMPE: -- and be consistent within
19 the --

20 MS. KAVANAGH: We will verify the rate.

21 MEMBER REMPE: Yes.

22 MR. TALBOT: I have several comments that
23 I think capture what you are looking for.

24 CHAIRMAN SKILLMAN: Okay.

25 MR. TALBOT: "Please add information to

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1 test flow rate to verify that there is no debris in
2 the system."

3 CONSULTANT WALLIS: No, verify there is no
4 debris, that means take a snake and look in there.

5 MEMBER RYAN: It is not just that there is
6 no debris; it is how you determine that.

7 MR. TALBOT: Yes. Yes, I have a comment,
8 "Please check the DCD to confirm the correct
9 language."

10 MEMBER RYAN: But it is more than that.
11 It is how do you determine the flow rate isn't
12 obstructed in any way?

13 MR. TALBOT: Okay, to determine --

14 MEMBER RYAN: You can do it by a flow
15 measurement, which tells you something, or you can
16 look with a camera to see if there are any
17 obstructions. What exactly are you trying to prove by
18 what you evaluate?

19 MR. TALBOT: "Use inspection techniques to
20 confirm no debris" --

21 MEMBER SHACK: Again, GE or somebody is
22 going to have to write detailed procedures for these
23 things.

24 MEMBER SCHULTZ: I presume they have.

25 MEMBER SHACK: Yes. Well, I don't know if

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1 they have yet.

2 MEMBER SCHULTZ: Well, they will.

3 CHAIRMAN SKILLMAN: They will.

4 MEMBER SHACK: They will, yes.

5 CHAIRMAN SKILLMAN: The pre-operational
6 test program I guarantee you will have procedures that
7 confirm flow, flow rate, absence of obstruction, and
8 this is pointing to hose.

9 CONSULTANT WALLIS: Well, maybe you should
10 say the tests should do the following, using
11 procedures as specified in blah, blah, blah, or
12 something.

13 MEMBER SHACK: Well, they haven't been
14 written yet.

15 MS. KAVANAGH: Yes. DCD still haven't
16 been approved.

17 MEMBER SHACK: Right.

18 CONSULTANT WALLIS: Okay.

19 CHAIRMAN SKILLMAN: Okay. Any more
20 comments?

21 CONSULTANT WALLIS: Yes, I have another
22 one.

23 CHAIRMAN SKILLMAN: Okay, Graham.

24 CONSULTANT WALLIS: "F", "Verify the DDS
25 design flow rate under the lowest-possible suction

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1 pressure provided by the DDCS pool level." Doesn't
2 the pool level push instead of sucking?

3 MEMBER SHACK: Lowest-possible head.

4 MR. TALBOT: Okay. What was the last
5 comment again?

6 MEMBER SCHULTZ: Frank, right where your
7 cursor is under "f", "suction pressure". Find the
8 word "suction" on the end of the line.

9 CONSULTANT WALLIS: Take away the word
10 "suction" and put "driving pressure".

11 MR. TALBOT: This here?

12 CHAIRMAN SKILLMAN: Yes, "driving head" or
13 "driving pressure".

14 CONSULTANT WALLIS: "Driving head" or
15 something. "Driving pressure" would be better.

16 MEMBER RYAN: Just type in "driving"; you
17 have got it.

18 CONSULTANT WALLIS: Yes.

19 MEMBER SCHULTZ: Okay, that is enough.

20 CHAIRMAN SKILLMAN: That is enough.

21 MR. TALBOT: Got it.

22 CHAIRMAN SKILLMAN: Okay. Any other
23 comments on what was our old page 8?

24 (No response.)

25 Okay. On our old page 9, and that will be

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1 Frank's page 10.

2 CONSULTANT WALLIS: There is "flow
3 pressure". There is another "obstructed" again in
4 a/b. That "b" at the top of page 9, "b", the second
5 paragraph.

6 CHAIRMAN SKILLMAN: "Bravo," Non-
7 obstructed --

8 CONSULTANT WALLIS: "Verify that" --

9 CHAIRMAN SKILLMAN: Yes, the same comment
10 as --

11 CONSULTANT WALLIS: -- "passages are not
12 obstructed."

13 CHAIRMAN SKILLMAN: The same comment. The
14 same comment as on the prior page.

15 MR. TALBOT: Got it.

16 CHAIRMAN SKILLMAN: I find it important on
17 your 2.alpha, "At 20-percent steady-state power,
18 initiate operation of one ICS train by opening the
19 condensate return valve and condensate return bypass
20 valve." That is getting awfully specific for a
21 general ITP. Is it really your intention to be that
22 specific? It looks almost as if you have lifted this
23 out of the DCD and carried it over into your initial
24 test program.

25 CONSULTANT WALLIS: That is right.

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1 CHAIRMAN SKILLMAN: You are going a little
2 bit too far. You might find that you can't do it at
3 20 percent or you really want to at 23.5 percent
4 because of other configuration issues.

5 CONSULTANT BONACA: I wonder if there
6 should be some caveat somewhere. You know, when I am
7 looking at page 2, it says, "Regulatory Guides are not
8 substitutes for regulations, and compliance with them
9 is not required."

10 CHAIRMAN SKILLMAN: Yes.

11 CONSULTANT BONACA: That is still true.
12 But, then, somebody at a plant could read this thing,
13 and it is so specific, that --

14 CHAIRMAN SKILLMAN: They feel compelled.

15 MR. TALBOT: I wrote these two questions.
16 "Did you pull this out of ESBWR or DCD? Do you want
17 to be this specific to the 20-percent power level?"

18 CHAIRMAN SKILLMAN: You may be confining
19 yourself or harming yourself by being so specific.

20 CONSULTANT WALLIS: Maybe it is covered by
21 "b".

22 CHAIRMAN SKILLMAN: Yes.

23 MR. TALBOT: Okay.

24 CHAIRMAN SKILLMAN: Okay. Any other
25 comments?

1 CONSULTANT WALLIS: Are we going to leave
2 "a" in or just say "b" is sufficient? Or leave it up
3 to them to figure out what to test?

4 CHAIRMAN SKILLMAN: Oh, let's leave it up
5 to them.

6 CONSULTANT WALLIS: So, we just remove "a"
7 altogether? Or should we advise them to remove "a"
8 altogether?

9 CHAIRMAN SKILLMAN: Oh, I don't think we
10 should do that. I think we should let the staff
11 determine the right way to handle this.

12 CONSULTANT WALLIS: Oh, okay.

13 MR. TALBOT: Okay?

14 CONSULTANT WALLIS: But the "b" might be
15 sufficient by itself?

16 CHAIRMAN SKILLMAN: It could be.

17 MR. TALBOT: Got that.

18 CHAIRMAN SKILLMAN: Yes. Good.

19 Any other comments on our old page 9?

20 MEMBER SHACK: Well, why is it one ICS
21 train? Is it one ICS train at a time? Or are you
22 only going to do this with one ICS train?

23 MR. TALBOT: I am thinking it might have
24 been guidance pulled out, but I need to verify this,
25 that they were testing one train in the DCD.

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1 MEMBER SHACK: Well, I could see for the
2 heat capacity maybe I could look at one train, but I
3 would sort of like to make sure I got flowthrough all
4 of the trains.

5 MR. TALBOT: Sure.

6 MEMBER SHACK: You know, a check valve
7 somewhere isn't installed backwards.

8 MEMBER SCHULTZ: I guess it is a deeper
9 question. I thought what this was trying to say, but
10 doesn't, is that each train ought to be able to remove
11 heat, but that you would test both trains to show --

12 MR. TALBOT: I added, "Should all the ICS
13 trains be tested?"

14 CHAIRMAN SKILLMAN: Well, it is perform a
15 heat removal capacity test on one train at a time, but
16 confirm all trains. You want them all to be
17 successful.

18 MEMBER SHACK: You sort of like them all
19 to work, yes.

20 CHAIRMAN SKILLMAN: Yes, yes.

21 CONSULTANT WALLIS: That is what you do
22 with accumulators and other things, too, isn't it?

23 CHAIRMAN SKILLMAN: Each train is
24 confirmed operable, right.

25 MR. TALBOT: Got it.

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1 CHAIRMAN SKILLMAN: Okay. All right. Any
2 other comments on our old page 9?

3 (No response.)

4 Okay, our old page 10, that will be your
5 page 11 there, Frank.

6 MR. TALBOT: Okey-doke.

7 CHAIRMAN SKILLMAN: Hearing none, our old
8 page 11, which is Frank's page 12.

9 MR. TALBOT: Low-pressure core flooder.

10 CHAIRMAN SKILLMAN: Yes. I would offer
11 that the comments that we have made prior to this may
12 have applicability here as well. So, the writers need
13 to go back and look at the earlier comments and see
14 whether or not they might also apply in these other
15 portions.

16 MR. TALBOT: Especially on NPSH.

17 CHAIRMAN SKILLMAN: Yes. Yes.

18 CONSULTANT WALLIS: Now wait a minute.

19 So, this is the old page 10?

20 CHAIRMAN SKILLMAN: Yes.

21 CONSULTANT WALLIS: The bottom line there
22 says, "Verify proper flow-induced vibrational pre-
23 operation testing." You know, you don't want to
24 verify the testing. You want to verify the
25 performance in some way, don't you?

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1 MR. TALBOT: Yes.

2 CONSULTANT WALLIS: So, testing isn't the
3 right word, is it? What do you want to say?

4 MR. TALBOT: "Verify adequate" --

5 CONSULTANT WALLIS: We know it is pre-
6 operational.

7 MEMBER REMPE: Just delete the words "pre-
8 operational testing"?

9 MEMBER RYAN: Aren't you doing something
10 like saying that the flow-induced vibration is
11 acceptable?

12 MEMBER REMPE: So, if you got rid of the
13 words "pre-operational testing," you are just
14 verifying that you have proper --

15 CHAIRMAN SKILLMAN: Yes, we are down on
16 "delta," "d"; 1.delta is where we are, Frank.

17 MR. TALBOT: Okay. I am in the wrong
18 place.

19 MEMBER RYAN: It is the last line on the
20 page up there.

21 CHAIRMAN SKILLMAN: Right, right there.
22 Yes.

23 I think what you are really saying is,
24 "Verify acceptable vibration during pre-operation
25 testing at flow," or something to that nature.

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1 CONSULTANT WALLIS: Something like that.

2 MEMBER REMPE: Just delete the words "pre-
3 operational testing".

4 MEMBER RYAN: It is not "proper"; it is
5 "acceptable".

6 MEMBER SHACK: Well, no, I think Dick has
7 it right. It is verify acceptable flow-induced
8 operation during pre-operational testing, something
9 like that.

10 MEMBER REMPE: Okay. So, you could add
11 "during".

12 CHAIRMAN SKILLMAN: You have got to
13 believe those are going to vibrate. That is what they
14 do.

15 MEMBER REMPE: I thought that the
16 introduction was the pre-operational tests.

17 CHAIRMAN SKILLMAN: So, I think that
18 should be "acceptable".

19 CONSULTANT WALLIS: The criteria for the
20 amplitude?

21 MEMBER RYAN: I would just make it a full
22 sentence and say, "Verify flow-induced vibration
23 during pre-operational testing is acceptable." Done.

24 MEMBER REMPE: I would just put a comment
25 that says, "Fix this."

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1 CONSULTANT WALLIS: Or "Verify acceptable
2 flow-induced vibrations." That is the same thing.

3 MEMBER RYAN: But, then, add a period.
4 There are too many other words; it is confusing.

5 CONSULTANT WALLIS: I think the message
6 has gotten across, hasn't it?

7 CHAIRMAN SKILLMAN: Add "during" there.

8 MR. TALBOT: Right there?

9 CHAIRMAN SKILLMAN: Yes, "during". I
10 think that is enough of a thought. What I am thinking
11 is, if you are going to run and shake it, make sure
12 that you are not shaking it beyond its appropriate
13 design basis.

14 MR. TALBOT: "Verify acceptable flow-
15 induced vibration during testing of the LIPSI sparger
16 structure," and then break it out.

17 CHAIRMAN SKILLMAN: Yes.

18 MR. TALBOT: Okay.

19 CHAIRMAN SKILLMAN: Okay. On to what was
20 our old page 11, your new page 12.

21 MEMBER SCHULTZ: Just before we get
22 there --

23 CHAIRMAN SKILLMAN: Okay.

24 MEMBER SCHULTZ: On the previous page,
25 going up -- yes -- the parenthetical "h" --

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1 MR. TALBOT: Oh, "g/h"?

2 MEMBER SCHULTZ: Yes. No, no, no, no, up
3 above. Up above, you were right at it. Keep going
4 up. There.

5 MR. TALBOT: That one?

6 MEMBER SCHULTZ: That one.

7 Now you have just gone through a number of
8 tests where you don't require the boron system to be
9 available, and then this last one is a statement
10 saying, before the entry into a tech spec mode in
11 which strict operability is required, do all this
12 other stuff --

13 MR. TALBOT: Uh-hum,

14 MEMBER SCHULTZ: -- including V10
15 verification, and so forth. To me, that in a sense
16 seems out of place for pre-op. It seems like a
17 different --

18 MR. TALBOT: Yes, because, normally,
19 during pre-op testing you don't have the boron in
20 solution. You just have a empty tank of water there.

21 MEMBER SCHULTZ: I don't know if this is
22 a caution or what, but if you could just flag for
23 further consideration as to how it ought to be
24 handled?

25 CONSULTANT WALLIS: and it needs another

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1 "2" instead of an "h". It is not a sub --

2 MEMBER SCHULTZ: Right.

3 CONSULTANT WALLIS: It is a section.

4 MEMBER SCHULTZ: That is correct; it seems
5 to be out of place --

6 CONSULTANT WALLIS: Right.

7 MEMBER SCHULTZ: -- is probably the best
8 comment.

9 MS. KAVANAGH: I have a question for you.
10 Since initial test program -- and that is what this is
11 -- it covers both pre-operational tests and startup
12 tests per se, do we need to delineate throughout the
13 document which are pre-operational and which are
14 startup? Would that make it easier?

15 MEMBER SCHULTZ: That is one solution.
16 But, again, I just think that this brings out a place
17 in its context. It is more of a caution.

18 MEMBER SHACK: Yes, but if she flagged it
19 as like, prior to startup, verify proper --

20 MEMBER SCHULTZ: Yes, that would be okay.
21 You certainly probably would do that during pre-op.
22 So, I am not sure if that whole paragraph makes all
23 that sense.

24 MR. TALBOT: I wrote this to confirm what
25 you are looking for: "This test appears to be out of

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1 place or be in the wrong place. Should this be a
2 prerequisite for startup test of the ECCS system?"

3 MEMBER SCHULTZ: Yes, that would be good.
4 Yes. That is fine.

5 MR. TALBOT: And we do, as you know from
6 previous discussions, at the very beginning we have a
7 prerequisite supporting the pre-op test. This notes
8 in my thinking that, before the startup test section
9 begins, I should put any or all appropriate
10 prerequisites before startup testing. So, this could
11 be moved potentially to a -- you have the startup
12 tests at C.2. You have a prerequisite section before
13 beginning those startup tests. Does that make sense?

14 MEMBER SHACK: That certainly seems
15 potentially the way to do it.

16 MR. TALBOT: Okay. Okay.

17 CHAIRMAN SKILLMAN: Okay, let's keep on
18 going here. Where are we?

19 MEMBER SCHULTZ: You were already on the
20 next page, I guess. I pulled you back.

21 CHAIRMAN SKILLMAN: We are on our old page
22 11, your page 12. It starts with RHR, ABWR.

23 MR. TALBOT: Okay.

24 CONSULTANT WALLIS: Yes, 1.f; 1.f is what
25 you should have said in 1.d before, "Verify acceptable

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1 vibration levels." That is the right way to do it.

2 MS. KAVANAGH: Can I mark this down as you
3 like this statement?

4 (Laughter.)

5 CONSULTANT WALLIS: 1.f.; it should have
6 said under "d" on the previous page. We already
7 changed that. So, leave it. Leave it. I am just
8 saying it.

9 CHAIRMAN SKILLMAN: Consider adopting for
10 other portions. Consider adopting for other portions.

11 CONSULTANT WALLIS: Right.

12 CHAIRMAN SKILLMAN: A good statement.

13 Okay. Any other comments on our old page
14 11?

15 (No response.)

16 Good. Thank you, Frank.

17 MR. TALBOT: Got it.

18 CHAIRMAN SKILLMAN: Okay. On our old page
19 12, which is your page 13, any other comments?

20 (No response.)

21 Team, okay, on our old page 13, which is
22 your page 14, any other comments?

23 CONSULTANT WALLIS: Well, we have got the
24 strainer clogged with debris, which we already handled
25 in the other Reg. Guide.

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1 MR. TALBOT: I have a general comment for
2 the component testing. "Pull up all the Reg. Guide
3 1.79 comments" --

4 CHAIRMAN SKILLMAN: Incorporate, right.

5 MR. TALBOT: -- on testing into this
6 section.

7 CHAIRMAN SKILLMAN: Incorporate, yes.

8 CONSULTANT WALLIS: This is C.2 on page
9 13?

10 MR. TALBOT: Yes, sir.

11 CHAIRMAN SKILLMAN: Yes, incorporate
12 comments from this section in 1.79.

13 CONSULTANT WALLIS: I think it is very
14 interesting here. Did someone else write this?
15 Because on these last few pages, every one of these
16 paragraphs opens up with, "Verify the design
17 acceptance criteria are met." Whereas, the previous
18 paragraphs or some other paragraphs say, "Verify
19 proper operation." There is some difference in style
20 here.

21 MS. KAVANAGH: I think that was consistent
22 with both Reg. Guides. Do you remember we had that
23 DAC discussion on our last Reg. Guide?

24 CONSULTANT WALLIS: Yes.

25 CHAIRMAN SKILLMAN: Yes.

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1 CONSULTANT WALLIS: So, if you don't have
2 DACs, you say just "proper operation"?

3 MR. TALBOT: Okay, under component tests,
4 I said, "Incorporate all comments from Reg. Guide
5 1.79" -- it is going to be regulatory position C.2 --
6 "to make both Reg. Guides consistent."

7 CHAIRMAN SKILLMAN: Yes. That will carry
8 us through our old page 13, your page 14, Frank.

9 CONSULTANT WALLIS: We are getting there.

10 MR. TALBOT: Okay.

11 CHAIRMAN SKILLMAN: Okay. Our old page
12 13, your page 14, any comments?

13 MR. TALBOT: Oh, I remember one for
14 documentation.

15 MS. KAVANAGH: We are not there yet.

16 MR. TALBOT: Sixty days prior to intended
17 use.

18 CHAIRMAN SKILLMAN: Yes.

19 MEMBER REMPE: It was in the other one.
20 So, I thought you would get it.

21 MR. TALBOT: Okay.

22 CHAIRMAN SKILLMAN: Sixty-day comment.
23 Thank you.

24 Okay. We are now onto our old page 15,
25 which is Frank's 16, and this goes into the OGC

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1 boilerplate.

2 With that, any comments on glossary of
3 acronyms, our old page 17, Frank's 18?

4 MR. TALBOT: I have got a couple.

5 CHAIRMAN SKILLMAN: I have got a couple,
6 too.

7 MR. TALBOT: Yes.

8 MEMBER SCHULTZ: Those are from 1.79, I
9 think. There might be some in here.

10 MR. TALBOT: Oh, those are 1.79?

11 MEMBER SCHULTZ: Yes.

12 MR. TALBOT: Okay.

13 CHAIRMAN SKILLMAN: I will give you one
14 that is not in 1.79 because it is not used, ITP.

15 MR. TALBOT: Oh, okay.

16 CHAIRMAN SKILLMAN: Add ITP.

17 Any other comments on our old page 18 or
18 19, our old 20 references, 21 references?

19 (No response.)

20 That will bring us to the appendices. Any
21 comments on the appendices?

22 CONSULTANT WALLIS: Yes.

23 CHAIRMAN SKILLMAN: Graham?

24 CONSULTANT WALLIS: Page A-2, in the
25 middle, "This sequence satisfies response requirements

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1 for all pipe breaks when the injection valve opens
2 within seconds after receiving the signal." Well,
3 that doesn't say anything because it could be within
4 10 seconds, 100 seconds, 1,000 seconds, 10,000
5 seconds. It says, "opening within seconds". It
6 doesn't say anything.

7 MR. TALBOT: Are you in the -- which
8 paragraph?

9 CONSULTANT WALLIS: On the long paragraph
10 and about eight lines down.

11 MR. TALBOT: Yes, we get into specifics on
12 pressure.

13 CONSULTANT WALLIS: It says, "within
14 seconds". That doesn't say anything.

15 CHAIRMAN SKILLMAN: It says that, when the
16 injection valve opens within second after
17 receiving...." And Graham's comment is, is that
18 .6673521 seconds or is that 600 seconds?

19 MR. TALBOT: I am trying to find the
20 seconds.

21 MS. KAVANAGH: It is over on the lefthand
22 side.

23 CHAIRMAN SKILLMAN: It is better than to
24 say "shortly after".

25 (Laughter.)

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1 MR. TALBOT: There it is.

2 MS. KAVANAGH: There it is.

3 MEMBER RYAN: How many?

4 CHAIRMAN SKILLMAN: Good comment. That is
5 a good comment.

6 CONSULTANT WALLIS: Well, it is just
7 descriptive material in an appendix. So, it is not so
8 important.

9 CHAIRMAN SKILLMAN: Yes, it is a good
10 comment, good catch. I mean, if we are down to
11 point --

12 MR. TALBOT: Well, we are getting into
13 1.55 megapascals. What about the seconds? Okay. I
14 got you. A good comment. A good comment.

15 CHAIRMAN SKILLMAN: Okay. Anybody else on
16 Alpha-2?

17 CONSULTANT WALLIS: Well, it says it
18 satisfies the response requirements because it opens
19 within seconds. That is not a requirement at all.

20 MR. TALBOT: Okay.

21 CHAIRMAN SKILLMAN: Any other comments on
22 the appendices, please?

23 CONSULTANT WALLIS: On page A-4 --

24 MR. TALBOT: Page 4?

25 CONSULTANT WALLIS: Page A-4.

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1 CHAIRMAN SKILLMAN: Alpha-4, yes.

2 CONSULTANT WALLIS: A big deal is made of
3 "The HPCF pumps are in an elevation below the water
4 level in the suppression pool. This ensures flooded
5 pump suction conditions." That is not the criterion.
6 The criterion is --

7 CHAIRMAN SKILLMAN: NPSH.

8 CONSULTANT WALLIS: -- NPSH, which is not
9 ensured by having a pump there. It doesn't ensure
10 anything. It just says it ensures further pump
11 conditions before they start, right, before it starts?

12 CHAIRMAN SKILLMAN: Oh, it is sure is
13 flooded if you take them apart when they are wet, I
14 can tell you that.

15 CONSULTANT WALLIS: Yes. And it is very
16 interesting, because if you go figure A-5 on the RCIC
17 system, the pump is way above the suppression.

18 MR. TALBOT: This is not the correct
19 criteria. It should be NPSH.

20 CHAIRMAN SKILLMAN: Dr. Wallis is making
21 the point, just because the pump is below the water
22 level does not necessarily ensure NPSH.

23 CONSULTANT WALLIS: Now look at figure A-5
24 on page A-6.

25 CHAIRMAN SKILLMAN: If the water is warm

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1 enough, you can boil, even though the pump is below
2 the water surface.

3 MR. TALBOT: Right.

4 CONSULTANT WALLIS: Right.

5 CHAIRMAN SKILLMAN: Okay.

6 MEMBER SHACK: But if your pump pumps two-
7 phase flow --

8 CHAIRMAN SKILLMAN: You can start it up
9 and you can choke it. Start it and choke it. Bam, it
10 stops running or stops pumping.

11 MS. KAVANAGH: Frank, you might to
12 consider just deleting that sentence.

13 MR. TALBOT: Excuse me?

14 MS. KAVANAGH: You might consider
15 deleting --

16 CHAIRMAN SKILLMAN: Yes, consider
17 deleting --

18 MS. KAVANAGH: Consider deleting that
19 sentence.

20 CHAIRMAN SKILLMAN: Yes, it is not helpful.

21 CONSULTANT WALLIS: And it is not a good
22 thing because, then, when you look at page A-6, you
23 see a pump which is above the level of the suppression
24 pool for a different system.

25 MEMBER RYAN: But the sentence you have

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1 got highlighted, if you just deleted it yourself, then
2 the problem --

3 CONSULTANT WALLIS: Delete it. Right.

4 MR. TALBOT: Okay.

5 CONSULTANT WALLIS: Okay?

6 CHAIRMAN SKILLMAN: Okay, let's continue.
7 We are nearly done.

8 CONSULTANT WALLIS: I think that is it.

9 CHAIRMAN SKILLMAN: Any other comments,
10 please, on the appendices?

11 (No response.)

12 Going once --

13 CONSULTANT WALLIS: Why do you have these
14 appendices?

15 MR. TALBOT: I put those in -- we went
16 back and forth with this. Some people thought that it
17 was unnecessary to put the appendices in there.

18 CHAIRMAN SKILLMAN: Too much detail?

19 MR. TALBOT: But I thought the detail was
20 necessary to support the testing information in the
21 regulatory positions. It helped the reader and the
22 COL in this case understand why the specific tests
23 were in the regulatory positions. So, that is why I
24 put the design information in the Reg. Guide.

25 CHAIRMAN SKILLMAN: And my position --

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1 MR. TALBOT: We did the same thing for
2 1.79.

3 CHAIRMAN SKILLMAN: My position is it is
4 the author's preference; it just must be accurate.

5 MR. TALBOT: That is correct.

6 CHAIRMAN SKILLMAN: Okay.

7 MR. TALBOT: I did get comments. GEH was
8 helpful in making sure this section was accurate, and
9 you have made it even more accurate.

10 CHAIRMAN SKILLMAN: Okay. Colleagues, any
11 more comments, please, on these attachments?

12 (No response.)

13 Joy and gentlemen, thank you.

14 Are there any other comments on 1.79 or
15 1.79.1?

16 CONSULTANT WALLIS: Well, generally,
17 again, I thought that when you first read it, it
18 sounds very good. It is just when you examine
19 carefully, then we make this points. But, overall, it
20 reads well. It looks like a good job.

21 CHAIRMAN SKILLMAN: Thank you.

22 MR. TALBOT: Thank you.

23 And with your comments incorporated, then
24 I now know that I have a document that will be usable,
25 that BWRs can use when it is time to implement this

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1 initial --

2 CHAIRMAN SKILLMAN: I would like to ask
3 that we see your final product again.

4 MR. TALBOT: Okay.

5 CHAIRMAN SKILLMAN: So that we can be
6 comfortable that our toil this afternoon has achieved
7 what we wanted it to achieve.

8 MR. TALBOT: Uh-hum. It has been three
9 hours and 37 minutes.

10 CHAIRMAN SKILLMAN: But there was a lot of
11 work before people came to this meeting --

12 MR. TALBOT: Oh, sure.

13 CHAIRMAN SKILLMAN: -- in their review and
14 effort, for which I thank them.

15 MR. TALBOT: I would say thousands of
16 hours.

17 CHAIRMAN SKILLMAN: Okay. So, is there
18 any other admin that we need to take care of here?

19 (No response.)

20 Any other comments from anybody before we
21 close the meeting?

22 Okay, let's go around.

23 Dr. Ryan?

24 MEMBER RYAN: No, thank you.

25 CHAIRMAN SKILLMAN: Dr. Wallis?

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1 CONSULTANT WALLIS: No.

2 CHAIRMAN SKILLMAN: Dr. Bonaca?

3 CONSULTANT BONACA: No.

4 CHAIRMAN SKILLMAN: Dr. Schultz?

5 MEMBER SCHULTZ: I am good. Thank you.

6 CHAIRMAN SKILLMAN: Okay. Dr. Shack?

7 MEMBER SHACK: No.

8 CHAIRMAN SKILLMAN: Dr. Rempe?

9 MEMBER REMPE: I think we should thank
10 Frank for his positive attitude with the numerous
11 comments he had to take today. So, I appreciate it.

12 MR. TALBOT: I did DG-1259, and you guys
13 get a shot at that one, too. Four hundred and fifty
14 to 500 comments on that Reg. Guide alone. I had to
15 rip that one apart and put it back together again.
16 So, this is, in comparison to that, I expect more
17 comments. It makes it a better product.

18 CHAIRMAN SKILLMAN: Panel, any comments?

19 MS. KAVANAGH: No. I just thank you for
20 your comments to us.

21 CHAIRMAN SKILLMAN: Thank you.

22 Everybody, thank you.

23 This meeting is dismissed.

24 (Whereupon, at 4:38 p.m., the meeting was
25 adjourned.)



Updated to Emergency Core Cooling System (ECCS) Regulatory Guides for the Initial Test Program (ITP)

RG 1.79, Preoperational Testing of ECCS for Pressurized Water Reactors, Revision 2 (DG-1253)

RG 1.79.1 Initial Test Program of ECCS for new Boiling Water Reactors, Revision 0 (DG-1277)

Presented by: Francis X. Talbot, P.E., NRC/NRO/DCIP/CQAB

ACRS Briefing
December 3, 2012
Rockville, MD



Outline: DG-1253 (Update to RG 1.79, Revision 2) and Creation of DG-1277 (RG 1.79.1, Revision 0)

- Summary of Public Comments
- Summary of Revisions
- Conclusions
- Attachments – Background/Objectives

Summary of Revisions to RG 1.79: Regulatory Guidance for ECCS Systems in New PWRs

- Regulatory Guidance C.1.b, New Medium Pressure Safety Injection Preoperational Test (Westinghouse Four Loop PWRs, US EPR)
- Regulatory Guidance C.1.e, New Emergency Letdown System Preoperational Test (US-APWR)
- New AP1000 Passive ECCS Preoperational Tests
 - Regulatory Guidance C.1.f, Passive Core Cooling – Safety Injection
 - Regulatory Guidance C.1.g, Passive Core Cooling – Emergency Makeup and Boration
 - Regulatory Guidance C.1.h, Passive Core Cooling – Emergency Core Decay Heat Removal

Summary of Regulatory Guidance in RG 1.79.1: Testing New ECCS in the ABWR and ESBWR

- Regulatory Guidance C.1.a, High Pressure Core Flooder (HPCF):
Preoperational Test (ABWR – HPCF)
- Regulatory Guidance C.1.b, Automatic Depressurization System:
Instrumentation and Flow Test and Power Ascension Test (ABWR,
ESBWR)
- Regulatory Guidance C.1.c, Reactor Core isolation Cooling:
Preoperational Flow Test and Low Power Test (ABWR)
- Regulatory Guidance C.1.d, Gravity Driven Cooling System –
Instrumentation and Flow Test (ESBWR)

Summary of Regulatory Guidance in RG 1.79.1: Testing New ECCS in the ABWR and ESBWR

- Regulatory Guidance C.1.e, Isolation Condenser System (ESBWR)
- Regulatory Guidance C.1.f, Standby Liquid Control System (ESBWR)
- Regulatory Guidance C.1.g, Low Pressure Core Flooder Low Pressure Coolant Injection Flow Test – Cold Conditions (ABWR)
- Regulatory Guidance C.1.h, Residual Heat Removal System; Preoperational Test and Low Power Test (ABWR) Reactor Water Cleanup System, Shutdown Cooling System Low Power Test (ESBWR)

Summary of Revisions: Other Regulatory Guides in RG 1.79 and RG 1.79.1

RG 1.79 and RG 1.79.1 includes other RGs related to ECCS testing:

- RG 1.82, “Water Source for Long Term Recirculation Cooling Following a Loss-of-Coolant Accident ,” provides guidance to support water source test acceptance criteria in RG 1.79 and RG 1.79.1
- RG 1.205, “Risk-Informed, Performance Based Fire Protection for Existing Light Water Reactors,” Regulatory Guidance 3.3, “Circuit Analysis,” provides guidance for the coordination and testing of protective breakers to prevent thermal overload of electrical ECCS pump motors.



Other Regulatory Guidance in RG 1.79 and RG 1.79.1: Prerequisites Before Testing and Component Testing

- Regulatory Guidance C, Prerequisites, contains guidance on lessons learned from air entrainment into ECCS systems.
- Regulatory Guidance C.2.c.(2) contains guidance on lessons learned from ECCS suction strainer debris issues to prevent clogging and pump failures.
- Regulatory Guidance C.2.f, “System Piping and Supports,” was revised to verify design and test acceptance criteria are met during system startup test conditions.

Summary of Public Comments on DG-1253

In May 2011, the NRC issued DG-1253 (RG 1.79, Revision 2) for a 60 day public comment period.

By the end of July 2011, the NRC received no public comments.

In August 2012, the NRC staff identified 6 generic public comments that applied to both DG-1253 (RG 1.79, Revision 2) and DG-1277 (RG 1.79, Revision 2). Specifically, Regulatory Guide C.2, “Component Testing,” and Regulatory Guide C.3, “Documentation,” were revised to address these comments.

Summary of Public Comments on DG-1277

- In June 2012, the NRC issued DG-1277 (RG 1.79, Revision 0) for a 60 day public comment period.
- In August 2012, the NRC received 44 public comments. General Electric Hitachi (GEH) provided 38 public comments.
 - GEH comments resulted in several changes to RG 1.79, Regulatory Guidance and RG 1.79, Appendix A, “Design Description of ECCS for New BWRs.”
 - The NRC staff identified 6 generic public comments that resulted in changes to RG 1.79.1, Regulatory Guidance C.2, “Component Testing” and Regulatory Guidance C.3, “Documentation.”

Conclusions

- RG 1.79 and RG 1.79.1 now have testing guidance for:
 - New passive and active ECCS systems in existing and new PWR and BWR plants licensed under 10 CFR 52.
 - ECCS air entrainment, ECCS debris sources, vibration testing of piping to meet ASME Section III Code, ECCS components, and testing to ensure protection of motors from thermal overload.

QUESTIONS ?

Attachment Slide: Background Information

- The NRC staff identified the need to update RG 1.79, Revision 1. The staff identified new ECCS preoperational tests in new PWRs (US APWR, US EPR and AP1000).
- The NRC staff also identified that a new RG 1.79.1 should be created for testing ECCS in new BWRs.
- Motivation for Updating RG 1.79 and Creating RG 1.79.1

**Attachment Slide:
 Background (Continued):**

Timeline:

NRC issues RG 1.79, Revision 1	September 1975
NRO/DCIP issues Draft Guide (DG) 1253 (Draft RG 1.79, Revision 2) to Office of Research (RES)	February 2011
NRO/RES complete 1 st Round of NRC interoffice review comments on DG-1253	May 2011
RES issues DG-1253 for 60 day public comment period	June 2011
NRO/RES received No Public Comments	September 2011
NRO/RES revise RG 1.79 to include 2 nd Round of NRC Interoffice Review Comments	December 2011
NRC issued RG 1.79, Revision 2	September 2012



**Attachment Slide:
 Background (Continued):**

Timeline:

NRC/RES Staff issues DG-1277 for 60 day public comment period	June 2012
NRC/NRO staff receive 44 public comments; GEH provided 38 comments, NRC staff provided 6 comments	August 2012
NRC/NRO Staff resolved public comments on DG-1277	September 2012
NRC/RES Staff send RG 1.79.1 out NRC Interoffice Review (NRO, RES, NRR, ACRS, OGC)	October 2012
ACRS subcommittee meeting on RG 1.79.1	October 30, 2012
NRC staff anticipate Issuing RG 1.79.1	November 2012

**Attachment Slide: Objectives for
Updating RG 1.79 and Creating RG
1.79.1**

RG 1.79 and RG 1.79.1 must follow:

- 10 CFR 50, Appendix A, General Design Criteria (GDC) (GDC 4, 5, 33, 34, 35, 36, 37 and 55)
- 10 CFR 50, Appendix B, Criterion XI, “Test Control”
- 10 CFR 50.34(b)(6)(iii) and 10 CFR 52.79(a)(28)
- NUREG-0800, SRP Section 14.2, “Initial Plant Test Program – Design Certification and New License Applicants” and DG-1259 (RG 1.68, Revision 4, “Initial Test Programs for Water-Cooled Nuclear Power Plants”)

Attachment Slide: Objectives - Why is RG 1.79 being Revised?

- RG 1.79, “Preoperational Testing of Emergency Core Cooling Systems for Pressurized Water Reactors,” Revision 2, includes the following:
 - Regulatory Guide 1.79 includes preoperational tests of ECCS for PWRs licensed under 10 CFR Part 52. ECCS Preoperational Tests added for new Design Certification applications (e.g., AP1000, U.S EPR and U.S APWR).
 - New Lesson Learned Operating Experience for ECCS Testing in PWRs.

Attachment Slide: Objectives Why was RG 1.79.1 Created?

- RG 1.79.1, “Initial Test Program of Emergency Core Cooling Systems for Boiling Water Reactors,” was created to include:
 - New ECCS Tests from the ABWR/ESBWR Design Certification Applications.
 - Additional lesson learned operating experience for ECCS testing in BWRs.