

Official Transcript of Proceedings
NUCLEAR REGULATORY COMMISSION

Title: Advisory Committee on Reactor Safeguards
 567th Meeting

Docket Number: (n/a)

Location: Rockville, Maryland

Date: Thursday, November 5, 2009

Work Order No.: NRC-3181

Pages 1-250

NEAL R. GROSS AND CO., INC.
Court Reporters and Transcribers
1323 Rhode Island Avenue, N.W.
Washington, D.C. 20005
(202) 234-4433

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

+ + + + +

567TH MEETING

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

+ + + + +

OPEN SESSION

+ + + + +

THURSDAY

NOVEMBER 5, 2009

+ + + + +

ROCKVILLE, MARYLAND

+ + + + +

The Advisory Committee met at the Nuclear
Regulatory Commission, Two White Flint North, Room
T2B3, 11545 Rockville Pike, at 8:30 a.m., Dr. Mario
Bonaca, Chairman, presiding.

COMMITTEE MEMBERS PRESENT:

MARIO V. BONACA, Chairman

SAID I. ABDEL-KHALIK, Vice Chairman

GEORGE E. APOSTOLAKIS

J. SAM ARMIJO

SANJOY BANERJEE

DENNIS C. BLEY

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 COMMITTEE MEMBERS PRESENT:

2 CHARLES H. BROWN, JR.

3 MICHAEL CORRADINI

4 OTTO L. MAYNARD

5 DANA A. POWERS

6 HAROLD B. RAY

7 MICHAEL T. RYAN

8 WILLIAM J. SHACK

9 JOHN D. SIEBER

10 JOHN W. STETKAR

11
12 NRC STAFF PRESENT:

13 MICHAEL LEE, Designated Federal Official

14 EILEEN McKENNA

15 FRANK AKSTULEWICZ

16 BILLY GLEAVES

17 SCOTT MORRIS

18 KARL STURZEBECHER

19 ERIC LEE

20 MARK TONACCI

21 GEORGE WUNDER

22
23
24
25
NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 ALSO PRESENT :

2 ED CUMMINS

3 ROB SISK

4 MICHAEL SHINN

5 MARK McBURNETT

6 HIROSHI SAKAMOTO

7 COLEY CHAPPELL

8 MIKE MURRAY

9 HIROHIDE OIKAWA

10 BILL STILLWELL

11

12

13

14

15

16

17

18

19

20

21

22

23

24

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

A G E N D A

OPENING REMARKS BY THE ACRS CHAIRMAN	5
AMENDMENTS TO THE AP1000 DESIGN CONTROL	
DOCUMENT	6
BREAK	94
DRAFT FINAL REGULATORY GUIDE 5.71, "CYBER	
SECURITY PROGRAMS FOR NUCLEAR FACILITIES"	95
OVERVIEW OF THE ADVANCED BOILING WATER REACTOR	
DESIGN AS APPLIES TO THE SOUTH TEXAS PROJECT	
COMBINED LICENSE APPLICATION	162
NRC STAFF'S PLAN FOR THE STP COLA REVIEW	228
ADJOURN	

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

P R O C E E D I N G S

(8:30 a.m.)

CHAIR BONACA: Good morning. The meeting will now come to order. This is the first day of the 567th Meeting of the Advisory Committee on Reactor Safeguards. During today's meeting, the Committee will consider the following; Amendments to the AP1000 Design Control Document", Draft Final Regulatory Guide 5.71, "Cyber Security Program for Nuclear Facilities, Overview of the Advanced Boiling Water Reactor Design As Applied to the South Texas Project Combined License Application, NRC Staff's Plan for South Texas Project Combined License Application Review, and Preparation of ACRS Reports. Portions of the sessions related to Reg Guide 5.71 and the ABWR may be closed to discuss and protect safeguards information.

This meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act. Mike Lee is the Designated Federal Official for the initial portion of the meeting.

We have received no written comments, or requests for time to make oral statements from members of the public regarding today's sessions. There will be several people on the phone bridge line to listen to the discussion regarding the South Texas COL

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 application. To preclude interruption of the meeting,
2 the phone will be placed in a listening mode during
3 presentations and Committee discussions.

4 A transcript of portions of the meeting is
5 being kept, and it is requested that the speakers use
6 one of the microphones, identify themselves, and speak
7 with sufficient clarity and volume so that they can
8 readily heard.

9 With that, we'll move to the first item on
10 our agenda, and it has to do with the Amendments to
11 the AP1000 Design Control Document, and Mr. Harold Ray
12 will lead us through that presentation.

13 MEMBER RAY: Thank you, Mr. Chairman, and,
14 Eileen, I guess.

15 MS. MCKENNA: I can come up to the front.

16 MEMBER RAY: We're ready for you. Let me
17 first make a few stage-setting comments.

18 We've asked for this presentation, as I
19 think members will recall, and I'm responsible for the
20 items that Eileen is being asked to address, so don't
21 blame her if she doesn't cover the right information.

22 The Full Committee received a briefing on
23 the AP1000 review back in May. The Subcommittee has
24 since met twice, and we're mindful of the fact that
25 there is, as I think Staff described in their original

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 presentation, there are extensive changes that we're
2 reviewing, both the Staff, and our ourselves. And we
3 want that effort to be as efficient as possible, given
4 the scheduled expectations, which are not entirely
5 clear, and change, perhaps, as time goes on. But,
6 nevertheless, we are mindful of the fact that there
7 are expectations for the completion of our review.
8 And this is a somewhat new experience for all of us,
9 so we wanted to be as efficient as possible.

10 In the May presentation, it was clearly
11 indicated that we would be proceeding with this review
12 on a chapter-by-chapter basis, so it has gone forward.

13 After the first meeting, we concluded it would be
14 most efficient for the AP1000 review if we were to do
15 it not in conjunction with, but ahead of the COL for
16 the first plant, so, that's the way the second meeting
17 was conducted. And I think it did go better for us,
18 anyway, in terms of focusing our attention on anything
19 important. But, nevertheless, we were asked, and I
20 know Eileen will attempt to respond, to look at the
21 overall picture, and help us identify the things that
22 we need to focus individual member attention to, so
23 everybody's interest is in play here. And, Eileen,
24 I'm sure -- I'll turn this over to you now, but I'm
25 sure you'll agree with me that we are learning how

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 best to do something of this magnitude on this kind of
2 schedule. Therefore, that learning experience is
3 something we all need to -

4 MEMBER APOSTOLAKIS: Harold, if I may ask.

5 MEMBER RAY: Sure.

6 MEMBER APOSTOLAKIS: The magnitude, what
7 is it that determines the magnitude of the problem?
8 Is it the number of changes, or the way they're being
9 implemented, or both?

10 MEMBER RAY: Well, the magnitude, to just
11 pick on that word, George, would clearly be determined
12 by the magnitude, but I would say also the nature of
13 the changes. In terms of the second thing you
14 mentioned, which is the process by which we're going
15 through this, I think a lot of people intuitively
16 would prefer to focus on the changes, rather than as
17 modifications of individual chapter text, which is the
18 way that the work has to get done, and the Staff,
19 particularly. But from our standpoint, one of the
20 things Sanjoy, I'm sorry he's not here, asked was to -
21 - and I think Eileen will try and respond to this,
22 identify the -- what are they called, Technical
23 Reports, Eileen?

24 MS. McKENNA: Yes.

25 MEMBER RAY: Technical reports which

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 underlie and support many of the changes, which are
2 then merely reflected in the text changes in the DCD.

3 So, to get back to your question, George, part of the
4 learning process is, I think, understanding that the
5 Staff has to process this just because of the way they
6 are organized, chapter-by-chapter, is that the best
7 way for us to approach this problem? Is there another
8 strategy that will better accomplish what needs to be
9 done by the ACRS? Are we trying, somehow, to
10 replicate what the Staff does, or are we doing
11 something different? And if we're doing something
12 different, how can we do that job best?

13 So, that's what I think is going on here,
14 and I think we should all engage in this discussion
15 with that in mind, that what we're trying to find is
16 how is the best way for us to do our job, and to
17 insure that we meet, as I say, as best possible the
18 expectations.

19 CHAIR BONACA: And, by the way, I'd like
20 to point out.

21 MEMBER RAY: Sure.

22 CHAIR BONACA: That is the subject of the
23 retreat on Saturday.

24 MEMBER RAY: Yes, sir.

25 CHAIR BONACA: To discuss among ourselves

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 way in which we can better serve, I think, the review.

2 MEMBER RAY: Yes. That will be, as I
3 conceive it, anyway, a generic discussion. This is a
4 case in point. There are, and will be others coming
5 down the road, so I think we just want to be
6 deliberate about the fact that we're not merely
7 talking about well, here's a problem that we need to
8 address, but how can we go about this, both
9 specifically to this application, and, more generally,
10 as Mario said, looking to the future.

11 So, with that long introduction, and,
12 again, taking the responsibility for asking you to
13 come here and talk about these particular things at
14 this time, Eileen, please proceed.

15 MS. MCKENNA: Thank you. My name is
16 Eileen McKenna. I'm a Branch Chief in the Office of
17 New Reactors, Division of New Reactor Licensing for
18 AP1000 Projects Branch 2, NWE2. That's why you see
19 that on the slide. With me today, also, is the Deputy
20 Director for Licensing Operations, Frank Akstulewicz,
21 sitting at the side table. And some of my PMs are
22 also in the room, and I may call upon them, depending
23 on some of the questions that the Committee may have
24 on chapters that they have responsibility for.

25 (Off the record comments.)

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MS. McKENNA: As my Subcommittee Chair has
2 mentioned, the purpose is to provide the status of the
3 AP1000 Design Certification Amendment. And, in
4 response to some of the suggestions he provided, we're
5 focusing on what is in part of the application, where
6 we stand with the Staff review. And, of course, where
7 do we stand with our interactions with the ACRS. At
8 the end, we will have a short discussion on the
9 reference COL, just to round out the picture. But the
10 focus of the briefing will be on the Design
11 Certification Amendment.

12 MEMBER APOSTOLAKIS: Eileen, is this the
13 first time we are facing such an issue of a certified
14 design, also for amendments.

15 MS. McKENNA: Yes, I would say -

16 MEMBER APOSTOLAKIS: Has any other design
17 gone through this, maybe to a lesser extent?

18 MS. McKENNA: No. I think not to the same
19 extent. You will, perhaps, in the future be seeing
20 other amendments of more limited scope. For example,
21 I believe in the ABWR -- Frank, do you want to speak
22 to that?

23 MR. AKSTULEWICZ: Yes. This is Frank
24 Akstulewicz. I think the closest we would get to what
25 we're seeing on the AP1000 would be the STP ABWR

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 submittal, where there is a large number, I won't use
2 the term "substantial", but a large number of
3 deviations from the currently certified design that
4 they are proposing, but not as an amendment. They're
5 proposing it on an individual plant basis for that
6 particular site. But the technical issues would be
7 the same. Right? It's just the process we're in is a
8 little different here with the AP1000, versus the STP
9 application.

10 MEMBER APOSTOLAKIS: Good. Thank you.

11 MS. McKENNA: I'll go through these next
12 couple of slides very quickly, because I think most of
13 you have seen them before in some form, but just,
14 again, put us all on the same page with the AP1000
15 design recertified. It's Appendix D to Part 52, and
16 that became -- that was based on Revision 15 of the
17 Design Control Document, and it really became
18 effective in 2006. The Safety Evaluation that was
19 prepared by the Staff is NUREG-1793.

20 After the certification, I think while the
21 COL application development was proceeding, we got a
22 request from the NuStart organization to review
23 various technical reports, as they were characterized,
24 which was kind of early interaction on these possible
25 departures, or what ultimately became things as part

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 of the amendment, changes to the Design Control
2 Document that were being sought to address certain
3 issues, COL items or design changes that might have
4 been desired as a result of the COL participation.
5 So, we started getting these technical reports, and we
6 would review them, but, as I said, in support of what
7 would ultimately become Design Control Document
8 changes.

9 MEMBER CORRADINI: May I just ask a
10 question?

11 MS. McKENNA: Yes, of course.

12 MEMBER CORRADINI: Just to connect back to
13 what Harold said at the beginning. So, are these the
14 technical reports that Sanjoy was referring to,
15 Harold?

16 MEMBER RAY: Yes.

17 MEMBER CORRADINI: Okay. And we have a
18 list somewhere.

19 MS. McKENNA: I provided to Mike Lee a
20 list of the accession numbers.

21 MEMBER CORRADINI: That's fine. I'm sure
22 we've got them somewhere. I'm not going to worry
23 about that. But the 100 -- are they all the same
24 type; that is, they -- in terms of character? Are
25 they of various magnitudes of changes to the design?

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MS. McKENNA: They are various magnitudes
2 of changes. There are some that are very small, and
3 focused on one or two changes, just because there was
4 like a Tier 1 change that they wanted to explain, and
5 that would only be a few pages.

6 MEMBER CORRADINI: Okay.

7 MS. McKENNA: There's others that are
8 quite large, that maybe have -- and, as I listed here
9 at the bottom, in some cases, there were topics that
10 had multiple technical reports to focus on different
11 areas. Like the seismic area, we had a report on the
12 base mat, a report on the shield building, we had a
13 report -

14 MEMBER CORRADINI: Okay.

15 MS. McKENNA: It was a critical session,
16 report on different aspects. Human Factors was
17 another one, where we had multiple reports on
18 different aspects of the Human Factors engineering,
19 and I&C is another good case.

20 MEMBER APOSTOLAKIS: On Human Factors?

21 MS. McKENNA: Yes.

22 MEMBER APOSTOLAKIS: Is the number 100
23 something that should impress us, or is -

24 MS. McKENNA: Just to give you an order of
25 magnitude, basically.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MEMBER APOSTOLAKIS: Order of magnitude?

2 MEMBER RAY: It could be two -

3 MS. McKENNA: I don't want to dwell on the
4 number.

5 MEMBER APOSTOLAKIS: I didn't know what to
6 be. I'm impressed now, myself. Gee, 100.

7 MS. McKENNA: Well, as I said, they vary
8 in size and scope. But the RAL has the same purpose,
9 which was to present proposed Design Control Document
10 changes, and the reasons for those changes, so that
11 the Staff could review them, and understand.

12 MEMBER CORRADINI: I know this is process,
13 and we're only supposed to about technical, but I want
14 to understand. So, is the Applicant required to have
15 some sort of backup technical report if they're going
16 in for some sort of Tier 1 or Tier 2 change? And,
17 therefore, is the Staff required to review, and then
18 issue an SER for each one of these things?

19 MS. McKENNA: Let me come at it slightly
20 differently. If we're in the amendment process, the
21 Staff has to issue a safety evaluation that approves
22 the changes to the Design Control Document. How we
23 get there is really a matter of -

24 MEMBER CORRADINI: It's up to you guys.

25 MS. McKENNA: -- what process -- we need

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 to understand what the changes are, why they're
2 acceptable. Whether that's through correspondence,
3 technical reports, RAIs.

4 MEMBER CORRADINI: Okay.

5 MS. McKENNA: Different ways it could be
6 approached.

7 MEMBER CORRADINI: That's fine. Just one
8 more clarification. Since you used ABWR as an
9 example, where they would do it as a deviation in the
10 first reference COL versus this, does the way you have
11 to review it change, whether it be an amendment to the
12 Design Control Document, or a deviation from the -

13 MR. AKSTULEWICZ: No. The answer is the
14 technical criteria are going to stay the same for the
15 acceptability. It's just how we document it, this
16 being the design cert amendment. There'll be a
17 separate license SER for STP that will cull out why
18 these modifications are acceptable.

19 MEMBER CORRADINI: Okay. Fine. Thank
20 you.

21 MEMBER ARMIJO: Eileen just before you
22 leave that.

23 MS. McKENNA: Yes.

24 MEMBER ARMIJO: Now, these deviations, I
25 think they're called departures.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MS. McKENNA: Departures is the official
2 term.

3 MEMBER ARMIJO: Right. Now, do they --
4 you will not issue -- write up an SER for a
5 departure, is the way I understand it.

6 MS. McKENNA: Okay. Let me -- let's go
7 back, take the South Texas case, and the way Part 52
8 is structured. For departures, there is a mechanism
9 by which an applicant can determine -- they do an
10 evaluation to decide whether a particular departure is
11 of such a nature that it requires approval, or is
12 something that could be done without approval. And
13 that's part of the process. And so the Staff in the
14 case of South Texas would only be approving those
15 departures that required approval. The other ones
16 would be part of the application. They're for the
17 Staff understanding. Staff could inspect the bases on
18 which the applicant determined those departures do not
19 require approval, but we don't have to actually
20 approve them.

21 MEMBER ARMIJO: Those that you do review,
22 the ones that they can't change totally on their own.

23 MS. McKENNA: Right.

24 MEMBER ARMIJO: Do you write an SER -

25 MS. McKENNA: Yes.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MEMBER ARMIJO: -- or something equivalent
2 to that? You write an -

3 MS. MCKENNA: Well, that's what Frank was
4 referring to, the SER for the combined license would
5 explain why those departures were acceptable, along
6 with the explanation of all the other material in the
7 application that wasn't related to the Design Control
8 Document.

9 MEMBER ARMIJO: Okay. I understand.
10 Thank you.

11 MR. AKSTULEWICZ: Excuse me. This is
12 Frank, again. Eileen, I think the Committee is going
13 to get a briefing on the ABWR STP soon, either this
14 afternoon or tomorrow, so you'll have the opportunity
15 to ask more specific questions about what's happening
16 in that design later.

17 MS. MCKENNA: Well, again, speaking more
18 specifically about the amendment process, we received
19 an application in May 2007 for an amendment to the
20 Design Control Document, and that was based upon
21 Revision 16 of the DCD. And using the part of the
22 process in 52.63, that basically gives the criteria
23 for considering amendments to design certifications.
24 As part of the new process, we received Revision 17 of
25 the DCD in September 2008. Our review has continued,

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 and there's been some additional changes that have
2 occurred as a result of back and forth with the Staff.

3 And those changes will be folded up and provided in a
4 future Rev 18 of the DCD.

5 MEMBER RAY: So that will be just
6 conforming.

7 MS. McKENNA: Should be just conforming of
8 all the changes that they've -- for example, when they
9 send us an RAI response, they would say okay, based on
10 your question we're going to clarify the DCD, or make
11 this design change. And here's what the words would
12 be in the DCD. When Rev 18 comes in, we're going to
13 go look to see did all those words that we expected
14 show up in there, the way we thought they were going
15 to be, so we can confirm that it is -- everything is
16 conforming. Yes.

17 MEMBER RAY: So, the amended certification
18 will be based on Revision 18, as we envision -

19 MS. McKENNA: We hope it's Rev 18. I
20 think it's -- there's always a timing question. If
21 you bring Rev 18, and then we find some late issue, or
22 the Committee raises something at the end, we have to
23 deal with, it's possible there would be a Rev 19.

24 MEMBER RAY: Okay.

25 MS. McKENNA: But we'll cross that bridge

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 when we get there.

2 How we're proceeding, I think you
3 mentioned some of this. We're using the same kind of
4 Six Phase review schedule that is being done for other
5 design certification reviews, where we issue an SER
6 with open items, have initial discussions with the
7 Committee, prepared an advanced final, have a final
8 round of discussion with the Committee, and then have
9 a Final SER that we issue.

10 MEMBER RAY: Okay. Now, Eileen, on that
11 point, maybe this is the appropriate point to -- have
12 you compared the time for this review, Six Phase
13 review in the case of this amendment with what was --
14 the time that was taken in the original certification
15 review? What I'm trying to get at is, to what extent
16 is there comparability between the amount of material
17 being reviewed in the original certification, and the
18 time that took, and the amount of material being
19 reviewed for the amendment, and the time that is
20 currently envisioned that that will take?

21 MS. McKENNA: That's a difficult question,
22 partly, because I wasn't part of the process back
23 then. I guess my sense, and maybe I might ask
24 Westinghouse to comment on this, since they've lived
25 through both processes. I think the original

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 certification was longer, and of large scope. Part of
2 the reason it's difficult to judge time, timing, is,
3 for example, a period of time when we were reviewing
4 like the technical reports, that wasn't, necessarily,
5 full time. It was kind of a fill-in, when we were
6 part of NRR, so we weren't, necessarily focused on
7 trying to complete it in a given time frame.

8 MEMBER RAY: It's not a fair question,
9 perhaps, too big. But, nevertheless, one has to try
10 and figure out how -- we're talking about how much
11 time we have to get this job done, have to look for
12 some other references in terms of how long did it take
13 to do something similar before.

14 MS. McKENNA: Right.

15 MEMBER RAY: And, is this similar? So,
16 that's why I asked the question, so we won't pursue it
17 further. But that is, nevertheless, something we need
18 to be mindful of, is having some kind of benchmark for
19 how long it takes to do something like this.

20 MS. McKENNA: Right. I think a lot of the
21 very fundamental parts of the design were really
22 covered before, the new features, we're seeing more
23 enhancements, so maybe changes in, if you will, some
24 of the more traditional parts of the plant. So, I
25 think that the time and the scope is less, but -

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MEMBER RAY: I'm sure the expectation
2 would be that, but then that presumes that you're
3 able, somehow, to sort -- when you're looking at
4 something holistically de novo, the first time, you
5 have to look at the whole thing. And if you're only
6 changing parts of it, you assume well, it will take
7 less time. But that's just an assumption we're
8 making.

9 MS. McKENNA: Right.

10 MEMBER RAY: And it also assumes you can
11 extract what's changed from what remains the same -

12 MS. McKENNA: Yes.

13 MEMBER RAY: -- in some systematic way.
14 And I'm sort of belaboring this, because I think
15 that's what we're trying to figure out here, is how
16 can we extract from a large number of changes just
17 those that deserve our attention.

18 MS. McKENNA: Right. And I agree. I
19 think it's been complicated for all of us involved in
20 the process. I think the technical staff has had
21 challenges with trying to okay, look at this, and
22 this, but not all the words in-between, you know, kind
23 of thing. But you need to understand the words in-
24 between to see whether these changes make sense. And
25 I agree, that's probably more harder to do than just

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 reviewing the whole chapter. Even writing it up
2 sometimes is harder to just explain why did this
3 number change from this to this, versus saying the
4 number is X, and the system works in this way. And
5 that's a lesson learned that you know is maybe not as
6 easy as it looks. It's like doing 100 license
7 amendments all in one big package.

8 MEMBER RAY: Thank you.

9 CHAIR BONACA: But it seems to me, both in
10 the amendment of the process, and also the DCD review,
11 we are really more of repeating the pattern of review
12 that the staff is doing. I mean, we really are
13 looking at each one of the individual changes and
14 trying to determine what the big picture change is. I
15 mean, what is the modification, et cetera? And,
16 clearly, we are the least equipped to be able to do
17 that, because we are just a few people, and it's a
18 very inefficient process.

19 Typically, a review is supported by an
20 SER, which has concluding statements. We can make a
21 judgment on the concluding statements. Yes, I agree.

22 No, I disagree with that. So, the way I see it -- I
23 mean, I'm branching out for a way of using a different
24 process than maybe giving us much more benefit, and
25 make us able to contribute more than just simply

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 repeating what the Staff has already done. And I
2 believe at the last meeting, Westinghouse was present,
3 we had some indication they could possibly provide
4 information in a way that would be helpful to that.
5 And I wonder if -- I believe this gentleman here
6 mentioned that. Anyway, we may want to explore as we
7 go forward.

8 MEMBER RAY: Well, I think, Mario, the
9 technical reports that Eileen referred to is maybe a
10 vehicle for us to use -

11 CHAIR BONACA: Yes.

12 MEMBER RAY: -- to focus on issues that
13 are addressed by technical subject area, rather than
14 changes in the text that Eileen and I were discussing
15 in a particular chapter where some words are changed,
16 some words are the same.

17 CHAIR BONACA: Okay.

18 MS. McKENNA: Okay. I think we're -

19 MEMBER BROWN: Can I give an example? For
20 instance, there was stuff identified in the I&C world.
21 Why is it difficult for the -- wrong question. It
22 would be helpful if the Staff could identify what was
23 the initial architecture it approved, and where, not
24 all the little one line stuff that goes on in there,
25 but where are the major architectural changes in that

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 design, and how it interfaces with the rest of the
2 plant. How many of them are there? Are there ten,
3 are there fifty? If you can narrow the scope -- you
4 try to read through some of the reports, they are
5 expensive, and you find a little red highlight here,
6 and a red highlight there, and you say well, what does
7 that mean? And without a little bit of help, it's
8 very difficult to say hey, are we missing something?
9 To me, that's what I was looking for in terms of the
10 discussion would have been floating around on how do
11 we do this particular certification?

12 MS. McKENNA: I hope you got -- I had sent
13 to the Staff, the ACRS Staff, a list of some of the
14 technical reports that were specific to the I&C
15 titles, and -

16 MEMBER BROWN: If we are missing
17 something, I'll go ask for it.

18 MS. McKENNA: Okay. That was part of the
19 intent, was to help, because that's coming in our
20 meeting in two weeks.

21 MEMBER BROWN: I'm sweating that one.

22 MS. McKENNA: But I think we will be
23 discussing what Staff sees as the major changes that
24 have occurred in that area, and the Westinghouse
25 presentation, I'm sure will also address what are the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 major evolutions, if you will, in the I&C area from
2 when the Design Acceptance Criteria were approved in
3 the certification to where we are now.

4 JUDGE ANTHONY: Okay. If you can -- it
5 would be helpful if you can do that not in words, but
6 in some type of a functional diagram that shows this
7 is what it looked like before, this is what it looks
8 like now, and this is the interface that changed.

9 MS. McKENNA: Okay.

10 MEMBER BROWN: Okay? And the nature of
11 the change. That's all. Just a way to grab that
12 piece of it, and say now we're not going to look at
13 the rest. We'll look at that, and we'll hold our
14 breath.

15 MS. McKENNA: Okay. Well, Westinghouse is
16 listening, and I'm sure we'll be making sure their
17 presentation speaks to that. And I will feed back to
18 our Staff that we should be looking to do the same.

19 MEMBER BROWN: Thank you.

20 MS. McKENNA: I was at the point that
21 several of us were just discussing in terms of looking
22 at the changes to the DCD, rather than reviewing the
23 entire DCD again. And, as was indicated, we are
24 issuing individual chapters as the work comes to a
25 point of closure with open items. And the intent is

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 that the SERs on a per chapter basis will ultimately
2 become a supplement to the NUREG, so it would
3 supplement, not replace 1793, so that the material
4 that wasn't changed was reviewed in 1793. The
5 material that did change is being reviewed in this
6 supplement. And, as was indicated, we have been
7 making presentations on individual chapters at ACRS
8 Subcommittee meetings.

9 MEMBER RAY: That seems the only way
10 that's practical to do it, Eileen, but the result
11 means then later on after the supplement is issued,
12 one really needs to read both documents to get the
13 whole picture.

14 MS. McKENNA: Yes, it could be, if you're
15 interested in a particular topic area, to understand
16 kind of how did it get to where it was in 15, and then
17 how did it change as a result of the subsequent
18 interactions.

19 MEMBER RAY: You can't just read the
20 supplement and understand.

21 MS. McKENNA: Not if you want to
22 understand how the whole design works. If you want to
23 understand just what was changed, it will help you.
24 But, yes, to understand completely how does the PCS
25 system work, you would need to probably look at both

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 documents. Hopefully, if you read the DCD from front
2 to back it would be -- that's where you are. That's
3 the final situation.

4 MEMBER RAY: Well, eventually, it would
5 seem that that would result in a -- sort of like an
6 encyclopedia with annual supplements. I mean, it gets
7 too impractical to -- you have to issue a new
8 encyclopedia after some point in time, because trying
9 to read multiple supplements to the original SER in
10 order to get a complete picture is going to be
11 problematic. But that's not what we're looking at
12 right now.

13 MS. McKENNA: That's not atypical of how
14 it was done before. There would have been the NUREG
15 for the license review, and then there would be some
16 number of supplements to deal with issues that hadn't
17 been completed in the original. So, yes, that's -

18 MEMBER RAY: It may be that there's good
19 precedent for it, so, yes.

20 MS. McKENNA: So, one of the items that
21 was asked about was RAIs. And we are kind of reducing
22 our inventory of RAIs rapidly, since the chapters have
23 gone out in most cases. We're down 40, they had 47
24 here. It kind of changes on a daily basis. And I
25 indicated here that in some cases, we have RAIs that

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 are really tied to open items, that they give more
2 explanation. For example, in Chapter 18, we had - I
3 forget the exact number - let's say eight open items,
4 and we actually issued along with it, in essence, 22
5 more specific RAIs to explain in a little more detail
6 what the big open item really referred to. And we are
7 kind of working those issues off, so that's why you
8 see, for example, we have a number of -- or labeled as
9 RAIs that deal with areas where we've already issued
10 the chapter. And those will be closing out and
11 transitioning totally into open item space. And then
12 we have, obviously, RAIs pending on chapters that we
13 have not completed. For example, Chapter 3, Seismic
14 area, we have ten open items - excuse me - RAIs
15 outstanding. In Chapter 6, we have seven, and there
16 are five others in miscellaneous chapters for various
17 reasons.

18 MEMBER RAY: One of the things that I've
19 been trying to figure out as Subcommittee Chairman is
20 whether we're looking at these things with more
21 outstanding RAIs than normal, would be the case. I
22 won't ask you to comment on that, but you're certainly
23 welcome to, if you wish.

24 MR. AKSTULEWICZ: This is Frank. I think
25 the answer is, traditionally, these chapters are

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 probably of the magnitude of open items that you're
2 seeing, given my participation in previous licensing
3 activities. So this is not an unusually large
4 inventory, I should say, at this point in time in the
5 review.

6 MS. McKENNA: Right.

7 MEMBER RAY: Frank, what is your -- maybe
8 I kind of -- what point in time in the review are we
9 at?

10 MR. AKSTULEWICZ: I would say we're
11 probably about halfway through. So, I mean, we're
12 finishing what would normally have been our Draft
13 Safety Evaluation in the old lingo. Right? So, we
14 would have substantial numbers of open items in the
15 chapters that we would be closing out if we were in
16 Part 50 process at this particular point in time.

17 MEMBER RAY: That's the point in time.
18 Thank you. Because one of the issues that we've also
19 struggled with was whether the chapters that have been
20 presented to us were intended to be sufficiently
21 complete that we didn't need to look at them again, or
22 not? And it hasn't been clear to me what the
23 expectation was in that regard.

24 MR. AKSTULEWICZ: The hope would be that
25 the chapters that would have no open items would be

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 ones that we would not have to revisit. But I fully
2 expect that when we come back with the full safety
3 evaluation and the final, what is the Advanced Safety
4 Evaluation, that is the opportunity for the Committee
5 to look across the design again in its totality,
6 because we would have said this design is as complete
7 as we understand it's going to be, and there aren't
8 any open issues that are in front of us. And we would
9 have understood all the inter-relationship of some of
10 the challenges of some of the Digital I&C, or the
11 sump, or the transient analysis, whatever those issues
12 be, shield building, seismic. And this would be the
13 opportunity to ask those types of questions of the
14 Staff, as it would be ready to go through the process
15 of its final licensing work. So, we'll have that
16 opportunity, again, to visit all of these issues,
17 theoretically, again.

18 MS. McKENNA: One of the other items that
19 was specifically asked about was Design Acceptance
20 Criteria. And in AP1000, there were DAC, DAC being a
21 subset of ITAAC that includes certain elements of
22 completion of design, and these were in three areas.
23 One is the instrumentation and control. In
24 particular, I've listed here the specific parts of the
25 ITAAC which relate to what we call DAC, and they arise

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 in both the Diverse Actuation System, and the
2 Protection and Monitoring System for these parts,
3 phases, if you will, of the development of the design,
4 the design requirements, system definition, and
5 hardware and software development. And, similarly, for
6 the PMS system, these parts of the life cycle, if you
7 will, have been referred to as DAC. They are not --
8 if you look in the ITAAC table, you won't see a
9 little star next to them that says these are DAC, but
10 if you look at the words of what they cover, and what
11 the action is to resolve them, the DAC flavor becomes
12 more clear, I think. Question?

13 MEMBER RAY: Question? No.

14 MS. McKENNA: Okay.

15 MEMBER RAY: On that. I mean, the idea of
16 the DAC, as Eileen characterized it, are a flavor of
17 ITAAC, something you have to do, we're going to talk
18 about it, also.

19 MEMBER BLEY: I mean, by definition they
20 are.

21 MS. McKENNA: That's correct.

22 MEMBER BLEY: We've just been dwelling on
23 how they're eventually going to get closed.

24 MEMBER BROWN: Well, the issue is timing,
25 isn't it? I mean, if the DAC are -- comparing the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 nature of the DAC, and the timing of those close outs,
2 and who does it.

3 MEMBER BLEY: Well, most of the -- many of
4 the DAC here are being closed now.

5 MS. McKENNA: Correct.

6 MEMBER BROWN: That's good. They ought to
7 be done now, not later. And I thought that's how we
8 kind of framed the issue before, as to who does that.

9 And I'll try to provide it to -- this is not a
10 regional inspector, for instance, who is not detailed
11 involved in those designs.

12 MS. McKENNA: Yes. It's quite correct
13 that part of this amendment process is intended to
14 resolve as much as possible of these DAC. And,
15 hopefully, we'll get all the way through, but that's
16 the goal.

17 MEMBER RAY: But, by listing these here,
18 you're not meaning that all of this scope will be, to
19 the extent that they represent DAC, will be resolved
20 in this amendment, just to the extent possible.

21 MS. McKENNA: To the extent possible. I
22 think when we present them, which will be in a couple
23 of weeks to talk about Chapter 7, you will hear that
24 we aren't quite there yet with all parts of these DAC,
25 that there's still information that we need in order

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 for the Staff to agree that all of the parts could be
2 closed. But that is still the intention, is to push
3 through these sections and get there. It's just
4 timing is really going to be what the size it is, can
5 that work be done at the time the amendment wants to
6 go forward.

7 MEMBER BLEY: Now, there was an issue that
8 came up in the Subcommittee that we pursue, and that
9 is, of the DAC that are getting closed, like the Human
10 Factors Engineering ones, we have yet to, and I still
11 have yet to look at those detailed technical reports
12 that are the basis for saying that those -- many of
13 those DAC have been resolved, and we need to look at
14 that to see if we're convinced.

15 MS. McKENNA: And, again, I did provide
16 some references that, hopefully, you'll have the
17 opportunity to do that.

18 MEMBER BROWN: Another point on that.
19 Thank you for reminding me, Dennis, that -- say you go
20 through the reports, and you get it defined, and you
21 say yes, we understand what it looks like. But it's
22 still a Tier 2 document at that point, or is this a
23 Tier 1 point, where that resolution now is locked in
24 concrete so they cannot change that functional layout
25 on their own without NRC approval?

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MS. McKENNA: What will happen is if they
2 get resolved, and they're not DAC any more, then there
3 would be information in the DCD that explains this is
4 now what the design or completion of those DAC is.
5 Now, generally, that would be Tier 2 material, but I
6 know in some cases -

7 MEMBER BROWN: I understand that, but one
8 of the problems I had with the Tier 2, Tier 1, is that
9 as it was explained to me, not lack of understanding,
10 is that Tier 2 is not part of the rule or the -

11 MS. McKENNA: It's not certified as part
12 of the rule.

13 MEMBER BROWN: Exactly.

14 MS. McKENNA: Yes.

15 MEMBER BROWN: So that it's not non-
16 deviation, in other words. People can make changes to
17 it.

18 MEMBER BLEY: They can make changes, but,
19 as I understand it, maybe you guys can talk to this,
20 there would be a process, nobody is living under this
21 right now, but there will be a process, something like
22 50.59 to allow them to make changes, as long as they
23 justify it's okay.

24 MEMBER BROWN: To whom?

25 MEMBER BLEY: To themselves, but approved

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 by the NRC.

2 MEMBER MAYNARD: The criteria by which it
3 will define which ones have to be approved by the NRC
4 versus which ones could be -

5 MEMBER BROWN: That is -

6 MR. AKSTULEWICZ: This is Frank
7 Akstulewicz. Let me try to shed some light on this
8 process. I think, at the risk of getting too far into
9 this, the process that we currently use under the
10 existing licenses with the FSAR and the 50.59 process,
11 is really similar to what a Tier 2 information control
12 process would be like. So, the first part of that
13 process would be that the licensee, at that particular
14 point in time, who decided wanted to make a change, it
15 would evaluate that change against the criteria that
16 are written in the rule, itself, that identifies what
17 should be something that the staff reviews. It will
18 come to a conclusion, and it will either submit for
19 review, or it won't. Those that won't be submitted
20 are held as changes that could be examined as part of
21 our inspection process, and P&IR inspections that we
22 typically do at operating units would be the vehicle
23 that the staff would go and look at, those design
24 modifications that they didn't submit as part of a
25 routine audit of that particular process. So, the -

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 MEMBER BROWN: Is that after the fact?

2 MR. AKSTULEWICZ: Yes. It's always -

3 MEMBER BROWN: The change is made, and
4 they review it after the fact?

5 MR. AKSTULEWICZ: Well, yes, if it's not
6 one that's reviewable, then that change is made, and
7 the Staff has the opportunity to go back and look at
8 it after it's been implemented. Yes.

9 MEMBER BROWN: But, Frank, the point is,
10 some Tier 2 changes have to get prior NRC -

11 MS. McKENNA: Yes.

12 MR. AKSTULEWICZ: That's correct.

13 MEMBER BROWN: That's the important
14 question.

15 MR. AKSTULEWICZ: That's correct.

16 MEMBER BROWN: That's what I'm trying to
17 get a -

18 MS. McKENNA: Yes.

19 MEMBER BROWN: But I don't know how it
20 gets done.

21 MS. McKENNA: Well, there's a couple -

22 MEMBER RAY: It gets done like the current
23 Part 50.

24 MR. AKSTULEWICZ: 50.90.

25 MEMBER RAY: Yes.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MS. McKENNA: And, in some cases, I think
2 some of these Human Factors documents are a case in
3 point. I think you're familiar with the Tier 2*
4 concept, where there was particular pieces of
5 information, or methodologies, or reports, or criteria
6 that the Staff felt were of sufficient import that
7 they really wanted to make sure they had the prior
8 approval. And they specifically designated these
9 things as Tier 2*. And I know several of the Human
10 Factors reports kind of fell in this category, where
11 if they wanted to change them, you kind of just pass
12 right through that. Could I do it without approval,
13 because the answer has already been made for you, so
14 the Staff would see those. And it would be, depending
15 on, again, what the timing of when it happened. It
16 would be part of a COL application that would be
17 reviewed before the license is granted, or if the
18 change was occurring, it would be a license amendment.

19 MEMBER RAY: But there is Tier 2
20 information you can't change without prior approval.

21 MS. McKENNA: Correct.

22 MEMBER RAY: Yes. And how you separate
23 the stuff you can change, from what you can't change,
24 as I understand it, is very similar to 50.59.

25 MS. McKENNA: Absolutely. It's laid out

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 in each appendix.

2 MEMBER RAY: 103 plants today.

3 MS. McKENNA: Right. The criteria are the
4 same.

5 MEMBER RAY: Yes. It's a rule for what
6 you can change without NRC approval, licensing basis.
7 So, it's not Tier 1, Tier 2. That isn't the
8 distinction. Tier 1, Tier 2 is another legal -

9 MS. McKENNA: Correct. Yes.

10 MEMBER BROWN: I understand that.

11 MEMBER RAY: Talk about that off line. I'm
12 going to quit right now.

13 MEMBER BROWN: Okay. Not that I want to.

14 MS. McKENNA: Okay. The second area where
15 there was DAC is in Human Factors Engineering, and it
16 appears in this table in the ITAAC. And these are the
17 elements that are considered part of this DAC. The
18 integration of the Human Reliability Analysis with the
19 Human Factors Engineering, task analysis performed in
20 accordance with - I hope you pardon my abbreviation
21 there - the Task Analysis Implementation Plan, Human
22 System Interaction Design for the control room in
23 accordance with the Implementation Plan, and the
24 Program Validation and Verification Plan being
25 developed in accordance with the programmatic level

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 description of the Human Factors V&V. These are the
2 parts of the DAC that, again, we're engaged in an
3 effort to agree that they are complete, and,
4 therefore, can be closed.

5 MEMBER BLEY: So, after this amendment,
6 those will not be DAC.

7 MS. McKENNA: They will not be DAC. They
8 will disappear from the Tier 1 table, and, instead,
9 you would have information in Chapter 18 pointing to
10 references or other information in the body of the DCD
11 that explains how all these things occur, and you
12 don't need the ITAAC DAC any more. Correct.

13 MEMBER BLEY: Great.

14 MEMBER APOSTOLAKIS: How does one
15 integrate Human Reliability Analysis with Human
16 Factors Engineering?

17 MS. McKENNA: I am not in the best
18 position to answer that question.

19 MEMBER APOSTOLAKIS: Is anybody in the
20 best position?

21 MS. McKENNA: I don't know if we have
22 anybody in the room that can speak to that, because I
23 think we have -- Rob, do you want to have -

24 MR. SISK: I couldn't hear the question.

25 MS. McKENNA: Oh. He was asking about the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 first bullet, of how do we do that, how do you
2 integrate the Human Reliability Analysis with the
3 Human Factors Engineering. I'm not sure I want to
4 venture an answer, since it's not my area of
5 expertise.

6 MR. CUMMINS: This is Ed Cummins. The
7 Human Reliability gets analyzed by the PRA. The PRA
8 identifies human actions required to achieve certain
9 safety states, and also identifies the time that the
10 operators have in order to do those things. And that
11 becomes a factor related to human reliability, gets
12 included in the PRA to estimate the effectiveness of
13 operators.

14 MEMBER BLEY: Now, let me -- what I
15 thought I heard at the last meeting, that I expect to
16 see in some of the supporting technical reports, is
17 that whatever those human actions are that are going
18 to be analyzed in a HRA and be part of a PRA will also
19 feed into the Human Factor Engineering Design Program,
20 such that -

21 MS. McKENNA: Controls, and how -

22 MEMBER BLEY: They'll look very closely at
23 how the operator interface works. And, perhaps, make
24 -- perhaps, adjust it to improve the situation. All
25 that's going on together, and that's why they call it

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 integrated. That's my understanding.

2 MR. CUMMINS: Ed Cummins, again. That's
3 correct. If, for example, in the Human Factors
4 process, if you have 30 minutes, and it took you an
5 hour to do it, then you would have to change the
6 operator interface so that it was more efficient, and
7 could be done in the available time by automating it,
8 or by making the process easier to accomplish.

9 MEMBER APOSTOLAKIS: Is there a Technical
10 Report on this?

11 MS. McKENNA: Yes, I believe there's a
12 Technical Report on this. I would have to check which
13 one.

14 MEMBER APOSTOLAKIS: I would like to see
15 it. If there is one, I'd like to see it.

16 MEMBER CORRADINI: So, just a side note,
17 just so I'm -- there was something given to us by
18 Staff, or, actually, AP1000 applicant to you guys, and
19 we got it in April of '07, which had a list of 105
20 technical-

21 MS. McKENNA: That's correct.

22 MEMBER CORRADINI: Same list?

23 MS. McKENNA: The list I'm giving -- I
24 gave to Mike most recently had some updates to it.
25 For example, that was the initial list -

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MEMBER CORRADINI: But it's fundamentally
2 the same.

3 MS. McKENNA: Yes, it's fundamentally the
4 same list. In some cases, we got revisions in some of
5 the reports, and then we had a couple of other reports
6 of a similar nature.

7 MEMBER CORRADINI: Okay.

8 MS. McKENNA: But, more or less, the same
9 list. Yes.

10 MEMBER CORRADINI: Thank you very much.

11 MEMBER APOSTOLAKIS: What is IAW?

12 MS. McKENNA: I'm sorry. That's was in
13 accordance with. I didn't want to have too many words
14 on the -

15 MEMBER APOSTOLAKIS: In accordance with.

16 MS. McKENNA: It's not International Auto
17 Workers, or something.

18 (Laughter.)

19 MEMBER APOSTOLAKIS: How does one validate
20 the Human Factors -

21 MS. McKENNA: I'm sorry? How does one
22 find data?

23 MEMBER APOSTOLAKIS: How does one
24 validate? I don't understand those things. Anyway,
25 you -

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MS. McKENNA: Again, I -

2 MEMBER APOSTOLAKIS: I understand -

3 MEMBER BROWN: George, you go to complete
4 plant mockup with all the controls, and bring all the
5 operators in, and then you run through all the
6 evolutions.

7 MS. McKENNA: You're not far off.

8 MEMBER BROWN: That's the only way of
9 doing it.

10 MS. McKENNA: I mean, that is -- Rob, do
11 you want to speak to that?

12 MEMBER APOSTOLAKIS: Oh, you have
13 unlimited resources, I assume.

14 MEMBER BROWN: Oh, very limited resources.

15 MS. McKENNA: I think if -- the SER does
16 discuss that. Do you want to -

17 MR. SISK: This is Rob Sisk, Westinghouse,
18 again. And just to kind of elaborate on how that
19 takes place, we did -- we have a full-scale
20 engineering development center, where operators can
21 come in, and they actually perform the activities.
22 And that testing feeds into those analysis, and that
23 interaction.

24 MEMBER BROWN: That's largely a main
25 control room -

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. SISK: It is a main control room.

2 MEMBER BROWN: Okay.

3 (Simultaneous speech.)

4 MR. SISK: And we have operators come in
5 that are plant operators going through the actions
6 that they would do on a day-to-day basis. We provide
7 some bases for the assumptions that go into the
8 analysis.

9 MEMBER MAYNARD: I did want to point out
10 that several months ago, the Subcommittee did go up to
11 the Westinghouse facility, observed the simulator and
12 talked to the Human Factors personnel up there.
13 Again, it was limited to the control room activities
14 there, but they did have a full-scale simulator, and
15 they were using it. And they did talk about the
16 operators coming in from the various plants -- pass
17 that along, just we did visit that facility.

18 (Off the record comments.)

19 MS. MCKENNA: Okay. Let me -- the last
20 area that has DAC was in the area of the piping, and
21 support design. And how this was implemented was,
22 there's a table in the DCD that contains a list of
23 analysis methods, codes, modeling assumptions,
24 acceptance criteria for the AP1000 piping and pipe
25 support design. There's some 27, 28 items, and that

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 is also part of the background package that I sent to
2 Mike, and he will get to you, the itemization of those
3 particular items. And I can give you an example, a
4 couple of examples just so you have an idea that
5 seismic anchor motions, the design -- the pipe support
6 criteria, codes, boundaries, baseplate anchor bolt
7 design, use of ASME codes, use of square root,
8 something squared to combine SSC and pipe rupture
9 loads, component support using particular ASME
10 section, using time history analysis to do the piping.

11 Those are the nature of the things that appear in
12 that table. And all of those items are in the DCD in
13 more detail. This table just kind of summarizes that
14 these are the key parts of how one would complete the
15 design of the piping, and they are to be followed in
16 that analysis.

17 And, again, the intention is to complete
18 the piping analyses sufficiently that the Staff can
19 perform an audit of how the design was actually
20 implemented, such that we've concluded that the DAC
21 have been satisfied. And as we discussed at our last
22 meeting, we're not quite there yet. There -- a large
23 number of packages were provided, but in some cases,
24 there were parts that still had open items, if you
25 will. And we felt that a little more work was needed

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 before we were ready to conclude that the DAC was
2 ready to be closed.

3 MEMBER CORRADINI: So, if I just might get
4 -- so, I guess when I was looking at the change basis,
5 is that the way it -

6 MS. McKENNA: Yes. Yes.

7 MEMBER CORRADINI: That thing that we got,
8 that these are the three big ticket items that are
9 substantially changed. And I didn't see anything
10 outside of these three big areas of DAC where there'll
11 be less DAC, and more specific design things that were
12 substantial. Am I missing the area?

13 MS. McKENNA: Well, I think these were the
14 only things that had DAC. So, therefore, we are
15 translating from DAC to no DAC. And it's that other
16 material in the upcoming slide, I have some other
17 design and hardware changes that are part of the scope
18 of the amendment review, that are not related to DAC.

19 MEMBER CORRADINI: But, I guess, I'm kind
20 of asking -- I'm looking for a judgment from Staff at
21 this point, which is, if it isn't in these three,
22 which I was expecting to see substantially, what are
23 the other substantive changes that you've been
24 focusing on? And if it's in your slides -

25 MS. McKENNA: It is in the slides. It's

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 coming up in about -

2 MEMBER RAY: It's just these are the only
3 three that had DAC.

4 MEMBER CORRADINI: Correct. I understand.

5 MS. McKENNA: Yes, that is part of the
6 presentation. I will be getting to that in a couple
7 of slides.

8 MEMBER ARMIJO: Eileen, which were the
9 risk-significant piping systems that you -

10 MS. McKENNA: What we did was, we looked
11 at all the piping lines, and what systems they
12 appeared in. And then the Staff prepared a list of
13 them. And we decided to include all the Class 1
14 piping, Class 2 and 3 piping in particular systems,
15 such as, say the ADS line, and the pressurizer, and
16 different parts of the system to give us a good sample
17 of all the systems, and make sure that we included the
18 major lines, and the ones that, obviously, of low
19 significance. We did consult with our PRA folks to
20 help us identify which were the most important systems
21 from this perspective, and then looked at what piping
22 packages that those systems would be analyzed in, and
23 came up with, I think it was like 48, or some such
24 number, of how the work is packaged by the analyst.
25 Because it's not, necessarily, that they look at a

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 system. They may look at this pipe connected to this
2 pipe that's part of two or three different systems
3 within a scope of anchorage, for example.

4 MEMBER APOSTOLAKIS: That's part of what
5 is done in risk-informed ISI, isn't it?

6 MS. McKENNA: I think it's similar in that
7 concept, but, yes, in terms of identifying what are
8 the risk-significant things -

9 MEMBER APOSTOLAKIS: The consequences.

10 MS. McKENNA: And the consequences -

11 MEMBER ARMIJO: So, for these systems, the
12 design will have proceeded to the extent that you're
13 satisfied -

14 MS. McKENNA: Right.

15 MEMBER ARMIJO: -- that they don't need to
16 be addressed with a DAC.

17 MS. McKENNA: Correct. I mean, this is --
18 again, this was the DAC part of it. They're still
19 ITAAC in terms of getting all the reports done, and
20 then later on the as-built verification. So, it's not
21 the end of the piping story, but it's, hopefully, the
22 end of the piping design story.

23 MEMBER ARMIJO: Okay. Great.

24 MS. McKENNA: Okay. I was asked about COL
25 information items. And, again, there is a list that

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 actually is in the DCD, as all of the COL items. It's
2 on the order of 150, depending on which version you
3 look at. And what I indicated here in the bullet, in
4 some cases, as part of the amendment, what was done
5 was to clarify whether the COL item is going to be
6 fully addressed by the application for the COL, or
7 whether there was some action that would have to be
8 held over to be done post licensing, something that
9 maybe require a walk-down, or development of
10 procedures, or something where it was not really
11 reasonable to expect that it could be included in the
12 application, and that the NRC could agree to that,
13 provided those actions were not necessary for us to
14 reach our conclusions, but were more verification, and
15 implementation activities. So, part of this review
16 was to kind of clarify who was going to be doing what,
17 so then when the COLs provide their applications, they
18 would address the items that say COL applicant, and
19 include information. And they would then, also,
20 address how, as a licensee, they would plan to
21 implement those COL holder items. So, this is just,
22 again, to give an idea that the DC amendment for
23 posing, I say closure/deletion of approximately 25
24 items, some cases being revised. And there actually
25 were items that were added for various reasons, as

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 issues were identified. A couple of examples, based
2 on the 20.1406 interactions, there were a couple of
3 new COL items on groundwater, and keeping records of
4 things. So, those were some additions. There's one
5 you'll see on having a monitoring program for the
6 metamorphic coupons in the fuel pool, for example. Those
7 are some additions to COL items that have arisen.

8 MEMBER RAY: Again, this was something we
9 asked Eileen to provide us, as a measure of the change
10 being made here, but under the amendment.

11 MS. McKENNA: Yes.

12 MEMBER RAY: I take responsibility for
13 asking for these data.

14 MS. McKENNA: Yes. Some of the -- again,
15 to come back to some of our chapter discussions, in
16 some cases we found that there was duplication between
17 a COL item, and an ITAAC, in which case we concluded
18 we didn't need to have both. An ITAAC was more than
19 sufficient, if they covered the same scope. And in a
20 number of other cases, Westinghouse had provided the
21 information that was being sought on the COL item, so
22 it was actually being closed and completed in the
23 design control document, rather than in the COL. I
24 gave you a couple of examples. I have more, if you're
25 interested, but the table has them all. I can move

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 on.

2 Schedule. We have to talk schedule.
3 Right? As we say, our last published schedule
4 indicated we would complete the last chapter of our
5 Safety Evaluation with open items in January. We're
6 in the process of evaluating our schedule right now
7 before Chapters 3 and 6, in particular, which are the
8 ones that are yet to come, 15 is coming shortly, so
9 it's on schedule. But 3 and 6, we have some
10 challenges due to expectations for additional
11 documents to be provided on the shield building, which
12 is a significant part of Chapter 3, Section 3.8 that
13 has not been completed, and we are expecting some
14 additional submittals on the sump design and
15 performance expecting in December, so we're going to
16 have to look at what that does to our schedule, and
17 try to complete that review, and then come back to the
18 Committee and see when we can be in a position to
19 discuss those chapters with the Subcommittee.

20 MEMBER RAY: The last chapter of the SER
21 with open items, that leaves hanging the question of
22 well, you guys, if there's a lot of open items, when
23 are we really expecting to be done with those? And is
24 that just something we don't yet have any way of
25 forecasting?

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 MS. McKENNA: Well, I think we have a plan
2 for the schedules -- the chapters that we've already
3 issued, where we know what the open items are, and
4 their scope. And we are looking at when those item
5 open responses are coming; and, therefore, when the
6 Staff can be in a position to review them, and prepare
7 its final safety evaluation input. And that will be
8 proceeding kind of on a chapter-by-chapter basis in
9 parallel with trying to get these last chapters
10 complete. And if we're -- we may even be able to get
11 to the point of an SER with no open items on those
12 chapters, rather than an intermediate step. We'll
13 have to see. But we are laying out that work based on
14 when we expect the responses, and what we see as the
15 resources necessary to deal with the issues.

16 MEMBER RAY: Well, I guess all I'm saying
17 is, one could say well, this lays out what -- this
18 slide that you have here on the screen lays out the
19 initial effort. But if one were to ask the question,
20 well, how much effort is there beyond that, and by
21 effort I'm looking at trying to bring people together,
22 how many days to do the work, we don't know yet, or
23 can we -- when are we going to get some more clarity
24 around that? Do you have any idea?

25 MS. McKENNA: We are actively engaged in

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 that right now. We've had one initial meeting, and we
2 have another one coming up the first of December.
3 We're sitting down with Westinghouse and the COLs to
4 go through what is the complete scope of work in front
5 of us, when are they going to be delivering product to
6 us so that we can then look at okay, we're getting
7 this in December, and this is January. And,
8 therefore, we think it's going to take us 100 hours to
9 complete that particular task based on the number of
10 open items.

11 MEMBER RAY: Okay. I understand. I don't
12 mean to -

13 (Simultaneous speech.)

14 MEMBER RAY: But my only point is, this
15 reflects the fact that as we look to the future, the
16 piece that lies beyond the first round of chapter
17 reviews with open items is still undefined.

18 MS. McKENNA: I think that's fair at this
19 point, and we'll have to get back with you when the
20 picture is a little clearer of when we think -

21 (Coughing.)

22 MS. McKENNA: -- with you.

23 MR. CUMMINS: This is Ed Cummins. I don't
24 think I agree. I think that the open items are very
25 clear. I mean, they're questions that we have to

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 answer, and there is 100 or so of them, and she has a
2 slide coming up to discuss them. And I think the -
3 those open items can be assessed by you, or the Staff,
4 or Westinghouse, and you can determine by your
5 assessment whether that's a significant open item, or
6 not a significant one. And we're trying to schedule
7 them all. And I think we're going to -- in my
8 opinion, they're not -- it's not a huge barrier, but
9 everybody can have their own opinion by just looking
10 at what the open items are.

11 MEMBER RAY: All right. Let's just assume
12 that we see in the open items some that we would think
13 we need to review. Taking that assumption just to
14 start with, and I don't know that it's true, but let's
15 assume that for starters, what information would we
16 rely on at this time, this Committee, as to when we
17 might have the information that would then enable us
18 to review the closure of that open item?

19 MR. CUMMINS: We would provide a schedule
20 to the Staff when we would submit the response to the
21 open item. The Staff would determine their review tie
22 of that, and then you could have a schedule, really,
23 of when you would have both the Staff and the
24 Westinghouse response.

25 MEMBER RAY: Well, I guess that's what I

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 was asking Eileen about. You're imagining that we
2 could go through and pick out a few, and then we could
3 do that. But now let's assume we decide well, gee, we
4 really would like to see the closure of all the open
5 items. Then I'm just asking her when is that likely
6 to occur, and I think she said there would be a
7 meeting in December.

8 MS. McKENNA: But that's in terms of our
9 meeting to figure out those dates, and not saying that
10 December 1st we can turn around and give you a
11 schedule.

12 MEMBER RAY: I understand nothing works
13 like that. But sometime in early December, the Staff
14 and Westinghouse will update your outlook for the
15 closure of open items. We can then, sometime after
16 that happens, figure out what it means to us.

17 MR. CUMMINS: That's correct.

18 MEMBER RAY: Fine.

19 MR. LEE: Eileen, do you have a date yet
20 for that December meeting, or is that something that
21 you're just -

22 MR. AKSTULEWICZ: This is Frank
23 Akstulewicz. The meeting is December 1st and 2nd in
24 Cranberry.

25 MR. LEE: Thank you.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MS. McKENNA: Cranberry is the new
2 location for the Westinghouse headquarters.

3 MEMBER BLEY: North Pittsburgh.

4 MS. McKENNA: Okay. Open items. We have
5 on the order of 120 open items at this point in time.

6 The table gives you the breakdown, and I tried to
7 give you a figure of merit here, that about -- we've
8 got responses to about a third of them. In large
9 part, that's because several of them have only
10 recently been issued, so hasn't really been time for
11 responses to come in. Here's the breakdown of which
12 chapters they appear in.

13 I'll note that in a couple of cases, some
14 of these open items are actually markers for the
15 Staff. That, for example, Chapter 1, that's kind of -
16 - let's go back and make sure that we tied up all of
17 our -- everything is consistent, and that all the
18 pieces fit together. There isn't really a specific
19 response being sought on that one. A few cases might
20 be the Staff booked an open item because they wanted
21 to do an audit of something. Again, not a specific
22 response expected. That's an action for the Staff to
23 complete.

24 MEMBER RAY: Are you still keeping a count
25 of contested and uncontested open items?

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MS. McKENNA: You asked about that. We
2 aren't really characterizing, at this point, anything
3 as being contested. I mean, I think they -- until we
4 get to closure, there is some level of either not a
5 meeting of the minds on how much information, or what
6 kind of information needs to be provided. They may
7 disagree with some of our conclusions on certain
8 things, but nothing that I wanted to characterize as
9 disputed open items.

10 MEMBER RAY: You're not -

11 MS. McKENNA: Not at this point. I'm not
12 saying we might not get there, but right now I would
13 say no.

14 MEMBER RAY: How come your printed page
15 said 124 -

16 MS. McKENNA: I knew somebody was going to
17 catch that. What happened on this was, when we issued
18 the chapters, there was 124. There were a couple of
19 cases where we got an initial response, and we said
20 not quite enough, so we issued a supplemental
21 question, if you will. And that's what's reflected in
22 the table, which is why you see 127 in the table. So,
23 I noticed that when I was doing my final review of the
24 slides -

25 MEMBER RAY: That's 127.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MS. McKENNA: Yes.

2 MEMBER RAY: This say Open Items of 124,
3 and open are 102.

4 MS. McKENNA: Yes. Well, the difference
5 here is which ones -- it's 127 between the two
6 columns, 102 of them is still open either because we
7 haven't received it yet, or we haven't finished our
8 review, and 25, which we've concluded that the open
9 item response is acceptable, so the 102 plus 25 is
10 127, which is meant to be the same as my 124, but it
11 didn't reflect these three that I was mentioning,
12 where there was -

13 MEMBER RAY: Okay. So, it's not really
14 open items. It's open and closed items.

15 MS. McKENNA: Yes.

16 MEMBER RAY: Okay.

17 MS. McKENNA: These were open in the
18 safety evaluation.

19 MEMBER RAY: Left open.

20 MS. McKENNA: Yes. Yes. It's tough to
21 explain, to characterize. Maybe I should just have
22 column. I don't know. I just wanted to give you an
23 idea.

24 This is the part that I think answers the
25 questions of Dr. Corradini. Beyond the DAC, what are

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 significant design and hardware changes? And,
2 obviously, significance is in the eye of the beholder.

3 And I've kind of combined design and hardware because
4 in some cases, I couldn't decide which category it fit
5 in better, in terms of whether it's hardware, or it's
6 design, or it's analysis, or some combination of all
7 three. So, I just listed here a whole set of things.

8 VICE CHAIR ABDEL-KHALIK: I was surprised
9 that none of the open items pertain to Chapter 15.

10 MS. MCKENNA: Well, Chapter 15 has not
11 been issued yet, so if you look, it's not even in the
12 table, because we haven't issued the chapter yet.
13 Chapter 6 is not on the table for the same reason.
14 These are only -- you only have an open item when
15 you've issued an SER with open times.

16 MEMBER CORRADINI: So, let me take Said's
17 question a bit further. So, with the design and
18 hardware changes, is Staff seeing anything in those,
19 or you want to wait to comment on that until it pops
20 out? I guess, I'm trying to get an idea of with
21 hardware changes, I don't know enough about Digital
22 I&C, but with hardware changes, at least, and things
23 such as head packages, pressurizer shape, et cetera,
24 are there things about Chapter 6 and 15 through the
25 safety analyses that are cropping up that give you

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 pause?

2 MS. McKENNA: I don't know whether -- I
3 mean, there are effects on the safety analysis from
4 these changes. Whether they give us pause is -- I
5 think we're almost trying to separate those questions.

6 Those things -

7 MEMBER CORRADINI: That's fine. You don't
8 have to answer my question. I -

9 MS. McKENNA: So, we do consider them.
10 You'll see Chapter 15 soon, and you will see where
11 some of that is reviewed. I know this has come up in
12 sort of our Subcommittee meetings, the effect, for
13 example, of the change in the pressurizer, the effect
14 of adding the flow skirt, some of these design changes
15 where there were questions about well, how did that
16 affect the safety analyses. And we will be having
17 those continuing discussions to make sure that those
18 are all understood.

19 MEMBER CORRADINI: Okay. Thank you.

20 MS. McKENNA: Yes. Absolutely.

21 MR. AKSTULEWICZ: This is Frank
22 Akstulewicz. I have just one more comment on that. I
23 think the reason you haven't seen Chapters 15 and 6
24 yet is because of the interrelatedness of the design
25 modifications on the analysis, long-term cooling, the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 relationship of the design modifications to the sump,
2 containment performance, and they're all coupled. And
3 that's why those chapters are running late, because
4 one change here affects multiple tentacles of those
5 particular analyses. So, when those chapters come
6 over, you'll see the integrated Staff analyses of all
7 those design modifications on the safety analysis.

8 MEMBER APOSTOLAKIS: Eileen.

9 MS. McKENNA: Yes, I'm sorry.

10 MEMBER SIEBER: The third bullet from the
11 bottom, the last two words, baskets moved.

12 MS. McKENNA: Is for the irradiation
13 specimens. They were relocated within the vessel just
14 to a slightly different location.

15 MEMBER SIEBER: Oh, okay.

16 MEMBER RAY: I was going to ask, Eileen,
17 could you -- I think we have time, if I'm not
18 mistaken. Could you just say a few words about each
19 one of these.

20 MS. McKENNA: Yes, sure.

21 MEMBER RAY: So that members can get a
22 little more idea, and perhaps motivate them to -

23 MS. McKENNA: The first one was seismic
24 analyses. I think one of the changes in this
25 amendment was to broaden, if you will, the range of

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 soil conditions that the plant could be sited at, so
2 that required some re-analysis to confirm that the
3 structural and equipment response spectra, and
4 information was bounding that range of soil
5 conditions. Then a generic issue with high-frequency
6 in certain areas of the country, so there's been
7 review of the effects of those high-frequency seismic
8 response on equipment.

9 MEMBER SIEBER: Now, that includes not
10 only structures, buildings, but also equipment
11 qualification?

12 MS. McKENNA: Equipment, yes.

13 MEMBER SIEBER: The hangers, and supports.

14 MS. McKENNA: Yes.

15 MEMBER SIEBER: That's a huge job.

16 MS. McKENNA: Yes, and that was part of
17 our Chapter 3 review. There are a couple of technical
18 reports that dealt with high-frequency, so it is an
19 area where the Staff has had a lot of interchange with
20 Westinghouse.

21 MEMBER SIEBER: Now, when the Staff
22 reviews that, do you review it to say you've used the
23 right codes, and put in the right parameters, or do
24 you look at the actual construction of structures,
25 piping, testing of equipment to confirm that the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 calculations support the actual physical features of
2 the plant? How far do you go?

3 MS. MCKENNA: I'm not sure I can fully
4 answer. I mean, I think the -- in general, not
5 limited to high-frequency, but when the Staff is
6 looking at the seismic analysis, they do consider what
7 are the structures, what are the equipment, how do
8 things get amplified up from down?

9 MEMBER SIEBER: Not, necessarily, the
10 details of the applicant's analysis. Right?

11 MS. MCKENNA: We do audits of analyses and
12 calculations. I'm not sure I'm fully answering your
13 question, but I'm also not sure -- I don't know.
14 Billy, do you think there's anything you can add in
15 terms of that? I know you've participated in a lot of
16 the audits.

17 MR. GLEAVES: I think you captured it.
18 This is Billy Gleaves. I think you captured what we
19 do, Eileen, in that it's a sampling. We're going to
20 look through the program from the top to the bottom,
21 as it relates to these analyses for seismic. And that
22 includes the computer analyses, you know, looking at
23 the outputs, inputs, and the whole bit.

24 MEMBER SIEBER: For the original analysis,
25 you already took into account the sloshing of the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 water in the tank -

2 MS. McKENNA: Correct.

3 MEMBER SIEBER: Those kinds of things.

4 MS. McKENNA: Ed, do you have a comment?

5 MR. CUMMINS: Yes. This is Ed Cummins.
6 Certainly in the piping DAC that we talked about, all
7 of the analysis is done with bounded spectra for all
8 the sites. And that affects the design of the pipe,
9 and the hangers for the lines selected for the piping
10 DAC. In the cases of equipment, like reactor vessel
11 internals and so forth, it's as Billy said, on a
12 sample basis, the Staff comes, and they audit our
13 stress analysis, and look to see that it covers the
14 entire spectrum of -

15 MEMBER SIEBER: Yes, just one more minor
16 question. Typically, designers, when they're doing
17 pipe supports, will design supports for lines larger
18 than maybe six inches, or something like that. Below
19 that, they'll use a template that says for one inch
20 line, steel line, put hanger every 20 feet. What is
21 the cutoff where you quit doing analysis, and start
22 applying the templates?

23 MR. CUMMINS: For the piping DAC, there is
24 none of the lines that were selected in the piping DAC
25 where we do any spacing table kinds of things. These

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 are sophisticated Class 1, Class 2, or Class 3 lines,
2 where all of the pipe supports are designed as
3 engineered supports.

4 MEMBER SIEBER: Engineered as opposed to -

5
6 MR. CUMMINS: Right. On spacing tables is
7 usually non-safety, usually cold, and non-thermal
8 kinds of pipe systems. We do have some spacing
9 tables.

10 MEMBER SIEBER: Yes. It's still two over
11 one.

12 MR. CUMMINS: Oh, yes.

13 MS. McKENNA: Okay. The second item has
14 to do with structural changes for aircraft-impact
15 assessment. And in this category, I include the
16 shield building, but there were other changes, and
17 some of these are itemized, and some of the more
18 detailed background information that I provided
19 separately. The next bullet, there were some other
20 enhancements to improve security, and ability to cope
21 with loss of large areas. Again, I'm not going to
22 dwell on those, but there is a little more information
23 in the background material.

24 A very significant area, that we've,
25 certainly, had a lot of discussion, and interchange

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 with is for the containment sump to deal with the GSI-
2 191, the debris, and chemical effects, downstream
3 effects. There's been a lot of change in this area, a
4 lot of analysis, testing that was done by
5 Westinghouse. Some of that we'll be discussing at our
6 next Subcommittee meeting. Staff has not finished its
7 review. I think we've made a lot of progress. We
8 understand pretty well how the sump performs with the
9 geometry, the flows, the different break locations, so
10 on. I think we're coming to the end of that road, but
11 we're not there yet.

12 MR. AKSTULEWICZ: Eileen, may I -- this is
13 Frank Akstulewicz, again. This is -- the sump changes
14 are an example of the impacts on Chapter 6 and 15,
15 because not only is it the sump screens, and the
16 bypass flows that get the water to the sump, itself,
17 and the screen characteristics of the sump screens,
18 but also the downstream effects in terms of what's
19 bypassing those screens, and the impact on the core
20 downstream from that. So, this particular issue is a
21 combination of both Chapter 15 and Chapter 6,
22 combination, just to give you an example.

23 MEMBER RAY: November 19th and 20th,
24 everybody come.

25 MS. MCKENNA: That's right.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MEMBER SIEBER: Well, let me ask you a
2 question about that. In the AP1000, the primary
3 safety feature does not require the use of pumps from
4 the sump. Is that correct?

5 MS. McKENNA: That's correct.

6 MEMBER SIEBER: So, what classification
7 from a safety standpoint does the sump and its
8 associated pumps and valves for recirculation, what
9 classification does that fall into?

10 MR. CUMMINS: This is Ed Cummins from
11 Westinghouse. The sump is still used. The sump is
12 used by a gravity head from the level of the water in
13 the containment. It has the same importance as it
14 does in an active plant. It's not pumped, but it
15 flows through the sump to the core to keep the core
16 cooled and filled. So, it's -

17 MEMBER SIEBER: Well, it's usable, but in
18 the fundamental way that it operates, it's just a
19 collection vessel, is it not?

20 MEMBER CORRADINI: I think Jack's point is
21 that the concerns you'd have with a forced flow system
22 is not the same concerns you'd have here. That's what
23 I -

24 MR. CUMMINS: The flow rates are lower
25 because the flow rates are done by gravity head,

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 rather than the -

2 MEMBER SIEBER: If you have no motor --
3 the sump is in the bottom of the containment. Right?

4 MR. CUMMINS: Right. And the water flows
5 in it from a gravity head.

6 MEMBER SIEBER: Right. And if there is no
7 flow out of the sump, if you do not rely on motor
8 power, nothing flows through the sump.

9 MR. CUMMINS: Oh, yes, flow goes through
10 the sump. It's a -- the flow from the containment
11 flow in through the sump screen, and then goes into
12 the core, and then goes out the ADS-4 valves, and then
13 goes around and around. So, basically, heats up in
14 the core, and -

15 MEMBER RAY: November 19th and 20th.

16 MEMBER BROWN: Oh, you're a good man.

17 MS. McKENNA: Okay. The next one listed
18 here was changes to the control room ventilation.
19 This is also in Chapter 6, so it's coming events for
20 the Committee. Integrated Head Package, I think we've
21 discussed this at some of the Subcommittee meetings.

22 MEMBER RAY: Well, my purpose, and maybe I
23 was wrong in saying you have enough time, Eileen, was
24 to try to solicit interest from members not at the
25 Subcommittee meeting.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MS. McKENNA: Okay. That's fair. Trying
2 to give you -- but, again, this is discussed in one of
3 the -- this technical report, and show up in the -- a
4 lot of it is reflected in Rev 17. Does have reduced
5 number of penetrations in the head. It has some other
6 advantages, in terms of dose, and timing for
7 refueling, that kind of thing. As mentioned, there
8 was a change in the pressurizer, make it shorter and
9 fatter, in essence, retains the volume but includes
10 capability for other concerns. Mentioned that flow
11 skirt was added inside, and neutron panels in the
12 vessel. This required a small change in the reactor
13 vessel diameter, and the question being the location.

14 I think because of the panels, where they had to go,
15 the baskets that contain the radiation specimens -

16 MEMBER SHACK: Specimens.

17 MS. McKENNA: Yes, specimen holders.

18 MEMBER SHACK: I thought you were talking
19 about the sump.

20 MS. McKENNA: Yes. No, no, sorry, not
21 those baskets, the vessel. The next one I listed here
22 was fuel storage racks. This was something that was
23 not part of the original certification. There are new
24 racks, both for the new and spent fuel, and there's an
25 increase in the capacity of the pool, number of

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 assemblies, so there's various design changes, and
2 analysis changes associated with that.

3 And last, I just had a set of other
4 changes, change in the voltage from 125 volts to 250
5 for the Class I-E DC power, second transformer, change
6 in the turbine manufacturer, and the control system
7 for the turbine, and some additional waste monitoring
8 tanks. So, that's kind of a big picture of the more
9 significant changes. If you look through, you'll see
10 a lot of other smaller ones, but this was what I kind
11 of pulled out as the more significant ones.

12 MEMBER CORRADINI: So, taking away the
13 structural changes from the shield building and sump,
14 which we have already gotten the preliminary PR on,
15 all the other things have been discussed, or have been
16 -- you guys have seen -- you've issued the open items,
17 you've had responses. I'm trying to get a feel for
18 where these are relative to -

19 MS. McKENNA: Well, I would say that we've
20 had RAIs, and exchange on everything. We've had
21 issuance of open items on most.

22 MEMBER CORRADINI: Okay.

23 MS. McKENNA: Ones that we haven't issued
24 chapters yet are the ones that -- we said Chapter 6,
25 which includes the sump and the control room.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MEMBER CORRADINI: Yes. Okay.

2 MS. McKENNA: And the racks we haven't
3 issued the SER.

4 MEMBER CORRADINI: So, where I'm going
5 with this is, from a technical standpoint, the things
6 that you actually have interacted with the applicant
7 on for the amendments, are there any things that -- I
8 don't want to use his terminology of contested, but
9 are there any things that look like big significant
10 barriers, or are you in discussions, such that you see
11 a way?

12 MS. McKENNA: Well, I think the one that
13 you probably all are aware of is the shield building.

14 MEMBER CORRADINI: Right. Taking that one
15 out.

16 MS. McKENNA: Okay. Leaving that one out,
17 I don't think that there's anything I see as a
18 barrier. I think it's just, we have to continue to
19 work and get to closure on them.

20 MEMBER CORRADINI: And understand what the
21 amendments are.

22 MS. McKENNA: Yes.

23 MEMBER CORRADINI: Okay.

24 MS. McKENNA: Yes.

25 MEMBER CORRADINI: All right. Thank you.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MS. McKENNA: There also was a specific
2 question about materials, and I listed some here.
3 Some were more significant than others, but just to
4 give you a flavor of changes. In some cases, there's
5 an update of the permanent record, and that resulted
6 in some changes. In other cases, I think it was a
7 matter of trying to procure components, and maybe some
8 different new materials, or allowing for additional
9 materials, that kind of thing. There's a change here
10 on the main steam line to different material,
11 flywheel, there was a change in the material. And I
12 listed another example, where for the reactor vessel
13 the change in the allowed copper limit, there's an
14 increase in that value, again, I think to facilitate
15 procurement of an appropriate vessel, adding some
16 additional stainless steel, reactor vessel internals
17 listed some of the types here, and there was some
18 specification of particular components within the
19 CRDMs, where maybe austenitic steel would be used for
20 this and that, and that kind of information was
21 included in the DCD.

22 MEMBER RAY: Eileen, could you just take a
23 note that -

24 MS. McKENNA: Yes.

25 MEMBER RAY: -- we do want to have another

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 further discussion on the Lessons Learned with regard
2 to the inertia, the need to increase the flywheel
3 inertia which caused the change in the material.

4 MS. McKENNA: Yes.

5 MEMBER RAY: There's an open question
6 still among the Subcommittee members about well, what
7 have we learned from that experience.

8 MS. McKENNA: Okay.

9 MEMBER RAY: It has to do with DAC, or --
10 I won't go any further now, but we just need to
11 revisit that experience. This is a change, that I
12 don't know that the change, itself, has any -- we've
13 explored it somewhat, and are there open issues with
14 regard to the change, other than what have we learned
15 from the experience. Okay?

16 MS. McKENNA: Okay. I think that's on our
17 list of our follow-up items from the meeting.
18 Certainly, the flywheel, and the questions of inertia
19 are there.

20 MEMBER RAY: Okay. Perhaps you captured
21 it already then.

22 MS. McKENNA: Okay. You asked also
23 specifically about changes in the fuel and core design
24 arena, not a lot, beside the one we talked about when
25 we had our Chapter 4 discussion, had to do with the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 gray rod control assemblies, the change of how many of
2 these had the silver-indium-cadmium within them.
3 There was language to allow borosilicate or wet
4 annular absorbers, and there were some changes to
5 methodology, if you will, of how, because of the
6 changes in the internals, how that affected
7 determining the total bypass flow, so that's more of
8 the core design area, just to give you an idea.
9 Again, some of the background material gives you a
10 little more specific information on that.

11 VICE CHAIR ABDEL-KHALIK: Now, you have a
12 list of hardware changes, material changes, and fuel
13 and core design changes. Do you also have a list of
14 changes in methods?

15 MS. MCKENNA: I don't think I have it
16 assembled in that fashion. Methods, obviously, it
17 varies. For example, in some of the seismic areas,
18 there might have been a change in method from, say,
19 doing a time history, to a response spectra for
20 various reasons. One particular one I can think of
21 that's a change in method, you may be aware of, is the
22 use of the ASTRUM for the uncertainty analysis, the
23 50.46 analysis. That's a change in method. The
24 others that are not coming to mind, because I wasn't
25 kind of doing a search for, but usually they were

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 driven more by either some design change that needed
2 to -- a method of analyzing it, for example, or the
3 ASTRUM. We think we had talked about in the May
4 meeting, even that it was a margin issue, I think,
5 primarily, to use that methodology.

6 VICE CHAIR ABDEL-KHALIK: The reason for
7 my question is that this may help us decide which
8 other Subcommittees should look at a major change. If
9 there is a big change in methods, perhaps you can
10 refer it to the Thermal Hydraulics Subcommittee to
11 look at it in a lot more detail.

12 MEMBER RAY: Absolutely. I agree. And,
13 therefore, we might conclude on a generic basis that
14 it facilitate this sort of thing if we had that up
15 front, because those meetings have to be scheduled,
16 the people have to be available, and so on.

17 MS. MCKENNA: Okay. So, we will take an
18 action to see if we can identify a list of what might
19 be considered significant changes in methods. I tried
20 to give a few examples of things that came to mind.

21 MEMBER RAY: You did very well, but see if
22 you can come up with anything else.

23 MS. MCKENNA: Yes. Okay. My next slide
24 is to summarize kind of where we've been with the
25 Committee. I characterized them as a orientation

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 briefings. We had a Full Committee meeting back in
2 October 2007, talked about AP1000 design, the design
3 center approach, and where we saw ourselves going over
4 the next few years. We had a further meeting this
5 past May, we talked more specifically about the
6 applications in front of us, and how we were
7 proceeding, more detail with the R-COL/S-COL approach.

8 We had our first Subcommittee meeting on AP1000 in
9 July, and we covered -- it was a grueling couple of
10 days. We covered ten chapters, and it was mentioned
11 we also discussed the COL chapters in that same
12 meeting, so there was a lot of ground covered at that
13 time. Again, those chapters, perhaps, have fewer
14 changes, fewer significant changes, so we were able to
15 get through that, although, with some long --
16 certainly a long day involved there.

17 Had an additional meeting this past
18 October, where we looked at, I call it three, it was
19 kind of a large part of Chapter 3, and two other
20 chapters, 8 and 18. We have a meeting coming up on
21 the 19th and 20th.

22 MEMBER RAY: And we covered some of the
23 items from the June meeting.

24 MS. McKENNA: That is correct, yes. That
25 is absolutely correct.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MEMBER RAY: Go to long lunches and
2 things, leave them in.

3 MS. MCKENNA: Right. We have a meeting
4 coming up the 19th and 20th. We'll be covering Chapter
5 9, which is auxiliary systems. It's got a wide range
6 of topics from fuel pool, fuel handling, cooling water
7 systems, a little bit on ventilation, a little bit on
8 fire protection. Chapter 9 kind of covers a lot of
9 territory.

10 We also be talking about Chapter 7, which
11 is instrumentation and control. And we do have half a
12 day scheduled for what I characterize as an
13 information briefing on the sump testing.
14 Westinghouse will be making a presentation of the work
15 they've done to support their design, and the analyses
16 that they've done for demonstrating the long-term
17 cooling. And we also have some plans for taking on
18 some of those other topics that the Committee was
19 interested in.

20 For example, I know there was a question
21 about how the gas accumulation in the lines was being
22 handled, and that's one of the topics that's planned
23 for this particular Subcommittee on the 19th.

24 MEMBER RAY: We may need to make sure do
25 something on one versus the other day.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MS. MCKENNA: Yes, if that's -- I mean,
2 I've given a proposed agenda to Mike, but if there is
3 a need to make adjustments based on availability,
4 certainly, we would try to accommodate that.

5 MR. LEE: Yes. I got the agenda last
6 night, as well as the list that Eileen has referred to
7 with all the technical reports. I declined to
8 transmit that to the members yesterday, because I had
9 the slides, and I didn't want to -- I'll get all that
10 out when we finish today.

11 MS. MCKENNA: And then we have on the
12 calendar a Subcommittee meeting in January. And we
13 would propose at that time, Chapter 15. We may have
14 some other of these picking up any issues that you've
15 had interest in in the past. And depending on where
16 we are with the other chapters, we may be able to give
17 you an update on some of those items.

18 MEMBER CORRADINI: So, just to move a
19 little bit ahead. So, the plan in January is to do
20 15, and 6 is still questionable.

21 MS. MCKENNA: Six is questionable. I
22 don't think we will finish our sump review, but there
23 may be other parts of 6 we might be prepared to
24 discuss.

25 MEMBER CORRADINI: Okay. That's fine.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MS. MCKENNA: Again, some of those other
2 follow-on topics that -

3 MEMBER CORRADINI: I just wanted it
4 clarified. That's all.

5 MS. MCKENNA: Yes. As we get closer,
6 we'll get more specific on that agenda. And that's
7 what we had on the Design Certification. We have just
8 a couple of slides on the COL. Most of my colleagues
9 on the Branch responsible for the COL are not in the
10 office today, so -- for various reasons, training, or
11 travel, so I'm going to -- with Frank's assistance, I
12 think I will try to push through with the COL
13 discussion. And, hopefully, we can answer your
14 questions.

15 A question was asked about the lead COL
16 status. And, as you know, the reference or lead COL
17 has changed over time. It was initially Bellefonte,
18 and now we are moving towards Vogtle becoming the
19 reference Col to be the first one through the process,
20 and would carry the burden of responding to the
21 standard content questions and issues. And we are, as
22 indicated here, very close to completing that
23 transition. We have issued chapters for Bellefonte
24 with open items.

25 MEMBER RAY: Excuse me.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MS. McKENNA: Yes?

2 MEMBER RAY: The transition, will it
3 retain Bellefonte as the reference?

4 MS. McKENNA: No, it will not. Vogtle
5 will become the reference. The reason for the
6 transition and the way we've addressed it, is that
7 we're kind of dumping through dockets that as the
8 reference, the standard material came in on the
9 docket. We issued the questions to the Bellefonte
10 docket for the standard content, and so that's kind of
11 why Bellefonte was, at least for the SER with open
12 items, stayed as the reference. What's going to
13 happen now that the chapter goes out, is that Vogtle
14 is now going to respond on their docket to the
15 standard content open items.

16 MEMBER RAY: Well, I understand why the -

17 MS. McKENNA: So that we can then write
18 the SER for Vogtle.

19 MEMBER RAY: -- agency needs to keep this
20 legally precise, and proper. But I'm thinking, is
21 there any reason for us, the ACRS Committee, to take
22 cognizance of Bellefonte, actually?

23 MS. McKENNA: Not as a reference. I mean,
24 ultimately, if we -

25 MEMBER RAY: We don't have to -

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(Coughing.)

MEMBER RAY: -- Bellefonte to find the answer to something that applies to Vogtle.

MS. McKENNA: Moving forward, it will all be in the Vogtle SER. You would not need to go back to the Bellefonte.

MEMBER RAY: Great.

MEMBER MAYNARD: And that's a question I had, make sure that this transition, when it's all said and done, the subsequent COLs will just have one reference plant to reference back to. There won't be some things that will be Bellefonte, and some things that will be Vogtle. So, it will be one reference plant.

MS. McKENNA: The way it works is that they, in essence, in their application have the same material that was in either Bellefonte or Vogtle for the standard content, so they don't really reference back, other than the Staff's evaluation that we then - we first issue it on the reference plant, saying we have evaluated this standard content, and found it acceptable for these reasons. Then when we get to the next SER, with that discussion, put it into the S-COL's SER, and say this is the information that's in their application. This is why it's acceptable. We

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 don't perform an additional review, other than to
2 satisfy ourselves that it was, indeed, standard, and
3 appropriate, and then issue a complete safety
4 evaluation to summarize an S-COL.

5 MEMBER BROWN: Can I ask that in a
6 different way?

7 MS. McKENNA: Sure. Yes, I know it's a
8 little confusing.

9 MEMBER BROWN: Vogtle FSER, will that be
10 complete in itself, and will not reference back to any
11 other documents on Bellefonte?

12 MS. McKENNA: Correct. Correct.

13 MEMBER BROWN: Also, Vogtle becomes the
14 reference for subsequent S-COLs.

15 MS. McKENNA: Right. In the case of
16 Vogtle, they have an early site permit, so you will
17 see referencing back to that, but not that -

18 MEMBER BROWN: Now, when you do the Vogtle
19 one, will that -- you say you're going to lift the
20 Bellefonte SER material -

21 MS. McKENNA: Standard content.

22 MEMBER BROWN: Standard content.

23 MS. McKENNA: Correct.

24 MEMBER BROWN: And for those that aren't,
25 you will then have to redo, reissue, re-evaluate, and

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 recompose, but how are those, where there are some
2 differences between Bellefonte and Vogtle, going to
3 be?

4 MS. MCKENNA: Yes. If there is site-
5 specific differences, site-specific questions for
6 Vogtle, they would have to be answered in the Vogtle
7 SER. We don't anticipate a lot of those, because of
8 the early site permit. Most of the site-related
9 issues have already been evaluated and closed as part
10 of the early site permit. But there could be some --

11 I guess there probably are some site-specific parts
12 of the COL that Vogtle will have to answer for
13 themselves, not on behalf of all the COLs.

14 MEMBER BROWN: So, those will be fresh
15 evaluations -

16 MS. MCKENNA: Yes.

17 MEMBER BROWN: -- relative to their -

18 MS. MCKENNA: That's correct. And,
19 similarly, when we get to any of the other S-COLs, we
20 would look at the site-specific information.

21 MEMBER BROWN: There's a little mix there.

22 MS. MCKENNA: There's a mix, just because
23 -- in any one chapter, there's a mix, information that
24 came out of the DCD, standard content information, and
25 site-specific information. So, it makes the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 bookkeeping in the SER a little complicated, yes.

2 So, anyway, we are, hopefully, moving to
3 the direction where all you will need to worry about
4 in the near term would be Vogtle, and then shortly
5 thereafter some of the other S-COLs, but you won't
6 have to keep in your mind both Vogtle and Bellefonte
7 at the same time.

8 So, most of the chapters are out, and the
9 last couple, as indicated, they -- the COL SERs don't
10 go ahead of the DC SERs. We need to make sure that,
11 since they're referencing back to it, we need to make
12 sure that they fit together, and are consistent. So,
13 we do not issue the COL SERs until we've issued the
14 comparable DC SER. Did you have a question? Okay.
15 So, those are the last chapters that still need to be
16 done on Bellefonte, to be the basis for the Vogtle.

17 So, Staff is preparing the Vogtle Advanced
18 Final SER with no open items. SER with the standard
19 content, the responses to those that come from Vogtle,
20 the responses from Vogtle on their site-specific RAIs,
21 and prepare Advanced Final SER with no open items.

22 This is the current schedule for Vogtle.
23 Obviously, as I said, we can't get ahead of the DC,
24 we'll need to look to see whether any adjustment is
25 needed on this schedule, but we would anticipate that

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 the interaction on Vogtle would be occurring in the
2 fall of 2010 with the Committee.

3 The next slide is a proposal that's been
4 offered by our COL colleagues to -- what's going to
5 happen between now and next fall in terms of
6 interaction with the Committee. And the proposal
7 that's being put forward here is that over the next
8 few months our Staff would meet with your staff to try
9 to identify if there are particular items or issues,
10 significant topics that the Committee is interested in
11 related either to the standard content, or anything on
12 site-specific, on Vogtle that hasn't been covered
13 already, and try to identify what those are. As time
14 permits, and over the course of the spring and summer,
15 we propose having some informational briefings with
16 the Subcommittee, so that those issues could be
17 explored, such that when we came forward with the
18 Final SER in the fall, that we wouldn't have any
19 surprises, or problems that arose at that time. And
20 seeking your feedback of whether you think this is a
21 viable approach, other suggestions to offer of how we
22 might proceed with Vogtle. And then, subsequently,
23 we'll have other S-COLs that will be coming forward on
24 site-specific content.

25 So, that's all I have. Frank, do you have

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 anything to add?

2 MEMBER RAY: Great. Good job of
3 responding to the laundry list of data inputs. Mr.
4 Chairman, we've got time, if members want to pursue
5 anything.

6 MEMBER BLEY: Yes. I'd like to revisit
7 something I asked Staff about at our Subcommittee
8 meeting. I've been thinking about it a little more.
9 The existing Certified AP1000 has DAC. The amended
10 certification will not have many of those DAC. What
11 I'm wondering more about is, shouldn't there be some
12 recognition in the SER of the clearance of those DAC,
13 that they were there for a reason, at least some
14 statement that that reason has been fulfilled, and how
15 it had been fulfilled. I'd asked if people looked at
16 the DAC, and looked at those acceptance criteria as
17 they were doing their reviews to see if the acceptance
18 criteria would have been sufficient to generate the
19 depth of questioning that they had raised in their
20 review. And they acknowledged they hadn't thought
21 about doing that. But the other side of it is,
22 shouldn't there, at least, be some accounting for the
23 DAC, and that they're completed?

24 MEMBER CORRADINI: So, can I -- I was
25 listening to your question. So, you're saying you can

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 almost use the fact that you got an amendment for a
2 change to see if the DAC actually performed any useful
3 function, that what they put in, essentially,
4 satisfied the DAC. That's what I think you just said.

5 MEMBER BLEY: Well, that's half of it.
6 That's what I asked at the Subcommittee, and I was
7 saying this is kind of a test bed to see if those
8 acceptance criteria really would work. The other half
9 is, when you issue an amendment to a license that --
10 to a certification that had DAC, shouldn't the SER
11 acknowledge those DAC were there, and describe
12 explicitly how they were cleared?

13 MS. McKENNA: Yes. And we agree with you
14 on the second point, that the SER should speak to --
15 because one of the things that the SER is saying is
16 that those DAC no longer remain in Tier 1.

17 MEMBER BLEY: It's not doing that
18 explicitly now, I don't think.

19 MS. McKENNA: Okay. Then maybe that's an
20 improvement we need to make in our Final SER, partly,
21 I think because at the time -

22 MEMBER BLEY: That would also facilitate
23 our review.

24 MS. McKENNA: Yes. I think part of the
25 reason I think that it may not have been as explicit,

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 is that in both Chapter 18, and Chapter 7, we're not,
2 as of this day, prepared to say everything as of right
3 now is fully complete, so our SER was a little more
4 couched in terms of, we've gotten this far. There's
5 this gap to overcome, and then we can close everything
6 out. So, I think that looking forward to the Final
7 SER, that's where we want to be, but I think that's
8 why we're not -- you're not seeing it as explicitly
9 right now. But, yes, I totally agree that that's
10 where we need to be when we're done.

11 MEMBER CORRADINI: What about his first
12 question? What about my interpretation of his first
13 point, which is, isn't this a good test bed to see
14 that the things that you agreed were sufficient enough
15 to leave as a DAC actually turned out to correspond to
16 what they chose to do?

17 MEMBER BLEY: There were a fair number of
18 RAIs that were generated during this review.

19 MS. McKENNA: Yes.

20 MEMBER BLEY: How would they have arisen
21 under the DAC process?

22 MEMBER RAY: That's a difficult
23 proposition, Mike. Why don't we pick it up at the
24 retreat?

25 MEMBER CORRADINI: Okay.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MEMBER BLEY: I think it's more for Staff
2 to think about. I mean, that's -

3 MEMBER CORRADINI: I mean, I'm not even
4 sure if I want to document it. I'm just simply saying
5 if you guys are comfortable going in, that you
6 certified it with all these DACs, and now they're
7 coming and they're amending it with all these things
8 that have been unDAC'd, is there some correlation so
9 that you learn something so the next, I might pick a
10 plant, another applicant with a DAC, you've learned
11 from it, so you can better identify them, if they're
12 not completed, if they're not detailed enough that
13 they stay as DAC through the COLA stage. I guess
14 that's what I'm trying to get at. It seems the
15 Staff's got to learn from this in some manner.

16 (Simultaneous speech.)

17 MEMBER BLEY: But there is actually a
18 Staff Working Group now that's trying to lay out a
19 process for closing those.

20 MEMBER RAY: I'm just saying the mere fact
21 that you found something that was satisfactory, and so
22 you removed the DAC, I don't think, necessarily, says
23 anything about the adequacy of the DAC to begin with.
24 And that's really the question you're asking. Or if
25 it does say something, it's a different analysis than

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 the one that needs to be done to okay the thing that
2 replaced the DAC.

3 MEMBER CORRADINI: Sure, but in some
4 sense, that's process. I want to know that the Staff
5 is recognizing this, and learning from it somehow.

6 MR. AKSTULEWICZ: This is Frank
7 Akstulewicz. Let me try to speak to that, but I'm not
8 going to get all the way to the answer. I sat in on a
9 couple of meetings this week with the Human Factor
10 folks, and one of the things that has been clear from
11 those discussions is, they now recognize that the DAC
12 that they were originally using as part of the
13 original certifications isn't rigorous enough, and
14 they're making changes in the DAC requirements for
15 some of the plants, like AREVA.

16 MEMBER CORRADINI: You don't have to name
17 names. I just want to make sure -

18 MR. AKSTULEWICZ: No, but I'm just saying,
19 I'm using that as an example, where the original DAC
20 that may have been present is not going to be the DAC
21 that they're going to move forward with in the future,
22 because of what they have learned as part of the
23 reviews on plants that have tried to close the DAC as
24 part of the regular licensing process.

25 MEMBER CORRADINI: Okay.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. AKSTULEWICZ: So, we are learning. I
2 think that's the message.

3 MEMBER CORRADINI: That helps. Thank you
4 so much.

5 MR. AKSTULEWICZ: Okay.

6 MEMBER BROWN: I don't want to lose sight
7 of Dennis' second point, though, going from no DAC --
8 from DAC to resolved DAC. You do want to have -- I
9 totally agree with you. I'd like to see how those got
10 resolved, how they were closed out, and what things
11 were looked at, and what was the depth relative to the
12 requirements in the -- for the various design -- parts
13 of the design.

14 MR. AKSTULEWICZ: This is Frank, again. I
15 think that's a fair expectation, and we'll take that
16 back and talk among ourselves.

17 MEMBER RAY: We are done, I think, Eileen.
18 Do you have anything more?

19 MS. MCKENNA: No, that's all I have for
20 the meeting.

21 MEMBER BROWN: I have one comment. The
22 November meeting can be very productive if we get some
23 -- on the I&C part of it, if we get some of these
24 differences, highlight what did it look like, what
25 does it look like now, what were the major changes,

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 and how are they reflected in the design so that you
2 can how they operate functionally. And talk to the
3 I&C architecture, not necessarily each of the
4 contacts, and switches, and logic diagrams, but the
5 fundamental architecture relative to what I would call
6 the four pillars of independence, redundancy,
7 determinacy, and defense-in-depth.

8 MS. McKENNA: What was your third
9 statement?

10 MEMBER BROWN: Determinacy.

11 MS. McKENNA: Determinacy. Thank you.

12 MEMBER BROWN: And then defense-in-depth,
13 which kind of define the bulwark or the pillars of
14 reliability for I&C. And that's not really clear from
15 the diagrams we see. We brought that up in the last
16 meeting.

17 MS. McKENNA: Yes.

18 MEMBER BROWN: It's been hammered several
19 times, so I'll just repeat it again.

20 MS. McKENNA: Okay. We'll be having
21 discussions of -- we'll see what we can provide in
22 advance, and, certainly, at the meeting.

23 MEMBER BROWN: Thank you.

24 MS. McKENNA: Yes.

25 CHAIR BONACA: Any further questions or

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 comments?

2 MEMBER ARMIJO: I had a couple of things.

3 CHAIR BONACA: Yes.

4 MEMBER ARMIJO: First of all, I appreciate
5 these -- preparing these summaries of the significant
6 changes in hardware and design materials, fuel and
7 core, providing methods needs to be added to that
8 list, that would help us plan our work, and, possibly,
9 and this is for Harold, that we could structure the
10 meetings based on this, hardware changes, and physical
11 things, as opposed to chapter-by-chapter, because some
12 of these things are -- clearly, the sump is going to
13 take a focus, but you could group some of these other
14 changes for reviews by Subcommittee, so you get them
15 off the table. For example, all the material stuff
16 could probably be handled in one Subcommittee, rather
17 than piecemeal as part of several chapters. So, I'm
18 just thinking out loud, that's something that we might
19 want to think about.

20 CHAIR BONACA: We will discuss that on
21 Saturday morning.

22 MEMBER ARMIJO: Yes. Anyway, I think
23 that's very helpful.

24 MS. MCKENNA: Okay. Thank you.

25 CHAIR BONACA: Any other comments? If

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 not, we'll take a break until 10:45.

2 (Whereupon, the proceedings went off the
3 record at 10:21 a.m., and went back on the record at
4 10:46 a.m.)

5 CHAIR BONACA: All right, let's get back
6 into session.

7 The next item on the agenda is the
8 Regulatory Guide 5.71, Cyber Security Programs for
9 Nuclear Facilities. And Dr. Apostolakis is going to
10 take us through the presentation.

11 DRAFT FINAL REGULATORY GUIDE 5.71, CYBER SECURITY
12 PROGRAMS FOR NUCLEAR FACILITIES

13 MEMBER APOSTOLAKIS: Mr. Chairman, the
14 subcommittee had a meeting with the staff on October
15 23rd. It was a very good meeting I thought. We
16 understood better where the stuff is coming from. At
17 the end of the meeting we went around the table and
18 expressed impressions and all that. Some people felt
19 that we were making good progress. Others felt that
20 this is too generic, we need to have more specifics
21 especially on the nuclear reactor part. Because it's
22 based on a number of reports and standards that have
23 been issued by the National Institute of Science and
24 Technology which are not nuclear reactor specific,
25 they are more general.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 So one of the things we would like to
2 understand better today is how can -- what is the
3 level of specificity, plant specificity, and of
4 course, what the whole regulatory guide is about. So
5 without further ado we'll go back to the staff.

6 Scott, want to say something first?

7 MR. MORRIS: Well, I'm going to kick it
8 off. So if you are ready Mr. Chairman?

9 CHAIR BONACA: Sure.

10 MR. MORRIS: Well, thank you, I am Scott
11 Morris. I'm the deputy director for reactor security
12 in the Office of Nuclear Security and Incident
13 Response. We don't - our office doesn't get many
14 opportunities to come and engage with the ACRS to talk
15 about things that are security related, so this is
16 somewhat unique in that regard. So we appreciate the
17 opportunity and hopefully by the end of our
18 presentation you will have a better understanding of
19 the document that we have produced; how it's evolved
20 since the last time we met to discuss it.

21 I want to spend five or 10 minutes just
22 kind of, before I turn it over to Karl, Eric and Mike
23 to go through the document - and I recognize we only
24 have an hour and a half, so I'm going to be very
25 brief. But I feel it important to at least give you

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 some of the background, the context associated with
2 the how and the why of the way we created the document
3 that we did.

4 So with that, I'm going to start by
5 saying - and I should also point out that in the
6 meeting notice we indicated that parts of this meeting
7 may wind up needing to be closed. I'm hopefully that
8 we won't need to do that. We are going to try to keep
9 this at a level where this is not necessary. But if
10 we sense that we are going there, we will have to call
11 a time out.

12 So with that, what I wanted to start by
13 saying, suggesting, is that particularly in the NRC,
14 and us as engineers, scientists, we trying to solve
15 problems through design measures; and that's a good
16 thing. The problem with security though is that you
17 simply can't solve all things security through the
18 application or implementation of design measures. And
19 that's been proven over time and history.

20 And the way we've constructed this reg
21 guide is consistent with that opening premise.
22 Basically what I'm saying to you is that there are -
23 unlike the way we view safety-system designs that are
24 grounded on a basic set of failures that we are trying
25 to preclude or prevent, like double E and the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 guillotine breaks of the largest single - or prevent,
2 like the double E and guillotine breaks of the
3 largest single reactor coolant system pipe, or drop
4 rods, or whatever, things that we analyze and try to
5 design features at the plant to prevent or maintain
6 the site of the plant within its design basis.

7 Much much more challenging in the security
8 space, largely because there is no definitive set of
9 attack records that we can, you know, conceive of
10 every possible combination of ways that something can
11 be attacked or compromised. And with the design basis
12 accident, and the analyses we talk about there, we
13 talk about, again, a set of operational events that we
14 don't want to, and try to put designs it to prevent.
15 But with security we are talking about an intelligent
16 malicious actor, an intelligent malicious adversaries
17 who learn. And they are knowledgeable. And they take
18 time to figure things out before they initiate their
19 deeds. And so the security realm, it becomes more
20 challenging to come up with some design that is going
21 to be in and of itself sufficient to preclude bad
22 things from happening.

23 So the other part of that, and what
24 potentially exacerbates the problem when we talk about
25 cybersecurity, is that we are dealing with digital

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 instrumentation controls; we are dealing with
2 networks, and information technology, that runs on
3 hardware and software. And as you probably know
4 through other briefings with the Digital I&C Steering
5 Committee subgroups and working groups, that we had a
6 real hard time figuring out how to model the failure
7 modes and Digital I&C and the application of risk.
8 And basically we just don't do it. We basically say
9 the state the art doesn't support it, so we just
10 aren't going there yet, and we are approaching that
11 whole problem from a different angle.

12 So we combined the intelligent malicious
13 learning adversary with the nature of Digital I&C and
14 network IT hardware and software. What you wind up
15 with is a conclusion that says, I can't simply design
16 a piece of hardware, a Digital I&C asset, that I can
17 assure myself for all time that will be protected from
18 cyber attack. I cannot do that in the security space.

19 So what do I do instead? Well, first of
20 all, let me say that trying to do that isn't a bad
21 thing; in fact we encourage that particularly with the
22 new reactor vendors and others in which they retrofit
23 older systems with newer digital platforms, is that we
24 should - based on what I just said we should not try
25 to develop system designs that aren't inherently

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 resilient to attacks and vulnerabilities. But what
2 I'm saying to you today is that that is only one leg
3 of the stool. There has to be defense in depth.
4 Because of the uncertainties that I've just spoken
5 about. And essentially, and this is entirely
6 consistent with how we managed this problem in the
7 physical security space, we relied on performance
8 based programmatic requirements that do a couple of
9 things.

10 Number one, that ensure that the assets
11 that need to be protected are identified and well
12 understood - how they are connected, how they are
13 physically located, how they operate. So that is
14 really step one. What are the things I need to
15 protect?

16 Number two, once I understand what those
17 things are, I need to apply a comprehensive set of
18 controls, technical controls, operational controls,
19 management controls, to - and apply those controls to
20 each of those things I'm trying to protect. And
21 that's where the NIST piece comes in, and these folks
22 will talk more about that.

23 The other thing is this idea of defense in
24 depth. It's acknowledged in security space that
25 irrespective of how you design your perimeter security

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 and your intruder detection, the first, second, and
2 maybe even third barrier to radiological sabotage
3 which is the endgame for the adversary may be
4 breached. It doesn't matter, I may design a vehicle
5 barrier, but at the end of the day the bad guy is
6 going to figure out how to defeat it. The problem is,
7 the goal is that there is another barrier, and
8 additional levels of defense in depth that there is
9 high assurance that the site of a licensee can
10 adequately protect against that adversarial result
11 before radiological sabotage occurs.

12 So that is in essence how we regulate and
13 establish our requirement and guidance associated with
14 security in general, and you will see cyber security
15 specifically today as these folks walk you through
16 the reg guide in its current state.

17 The basically security model that is
18 employed, both physical security and the one that you
19 will see here today, is deterrence, detection, delay,
20 assess, respond and recover. So the model that we are
21 talking about today for cyber is consistent with that.

22 You want sufficiently robust systems in place, and
23 measures in place, to deter the bad guy, but even if
24 he comes at you, you want to be able to detect him,
25 delay his progress in achieving his radiological

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 sabotage goal, assess what he is trying to do,
2 hopefully in near real-time, and be able to respond to
3 those attacks effectively before radiological sabotage
4 occurs, which again is the ultimate performance
5 objective for all things security at nuclear power
6 reactors.

7 Now before I yield to these gentlemen,
8 there has been a lot of discussion and I touched on it
9 earlier about the use of risk assessment, and risk
10 pools and vulnerability analyses, to try to figure out
11 what is it I need to protect. And in fact the first
12 iteration of our reg guide was exactly built on that
13 premise: how can we leverage the couple of decades of
14 experience that we have accrued in understanding how
15 nuclear plants work and what their failure modes are,
16 leverage that knowledge and experience to build a
17 regulatory guide that is focused not only on
18 protecting those systems that are particularly
19 significantly significant from a risk standpoint, and
20 then another level of sophistication, to say okay,
21 once they've figured out those, how can I use risk to
22 try to identify what the appropriate set of security
23 controls I need to put in place for this.

24 And what I'm telling you today, and what
25 you are going to hear today, is that we have abandoned

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 that approach, and for good reasons. Because number
2 one, our expert elicitation, unfortunately, some of
3 our experts - one of which is not here today because
4 he has the swine flu, but he was at the subcommittee
5 meeting - had taught us a valuable lesson. And it's
6 actually a lesson we already knew, but we just kind of
7 missed it. We didn't adequately translate that lesson
8 in physical security into cyber security.

9 And that is that the use of risk
10 methodologies to try to get in not only get in the
11 minds of bad guys but then to try to understand what
12 are all the vulnerabilities and risks associated with
13 hardware and software and connectivity and network
14 design is incredibly difficult, laborious, painstaking
15 task, that at the end of the day the professional
16 literature says hasn't been done or proven to be
17 effective to any degree. And our experts, which our
18 experts have subsequently confirmed. But also that
19 the risk by applying those types of measures, using
20 risk-based tools to try to establish a program and
21 figure out what controls to put in place at the end of
22 the day would require not only an enormous amount of
23 analysis but an enormous amount of documentation, and
24 that documentation would prove to the independent
25 oversight organization, namely the NRC in this case,

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 through inspection or licensing or whatever, would be
2 very difficult to have all - when you think about
3 particularly new reactors, which are going to be
4 almost exclusively digital, the amount of analysis and
5 paperwork and documents it would be pretty extreme.

6 And so one of the ways we deal with that,
7 again, is we have evolved our reg guide to be more
8 consistent with the methodologies and protocols
9 established by the National Institute of Science and
10 Technology, and specifically with two key special
11 publications, in this case it happens to be 800-53,
12 and 800-82, in which they have used their consensus-
13 based standards process, established a broad set of
14 technical, operational, and management security
15 controls that should be applied to digital assets that
16 need to be protected. But they also say, NIST that
17 is, that these controls should be tailored for their
18 particular application. And that is precisely what my
19 team has done in collaboration with the industry is to
20 start out with a set of NIST standards, security
21 controls; boil them down to those that are essential
22 to the nuclear facility application.

23 And that is what you will find in Appendix
24 B and Appendix C of Reg Guide 5.71, basically a
25 derived set of security controls that are based on the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 NIST product.

2 One thing I would also say is, this is
3 precisely what we do in the federal government.
4 Federal Information Security Management Act, or you
5 may hear it referred to as FISMA, is a mandate placed
6 on every federal agency to be in compliance with. And
7 not surprisingly, the NIST standards that I refer to
8 form a basis for federal government demonstrations
9 that they are meeting their requirements of FISMA.

10 And so we are not really asking - we are
11 basically leveraging success here is what I'm telling
12 you. We are not inventing a new wheel. We are not
13 creating something that hasn't been created before and
14 hasn't been proven. We are leveraging success.

15 Just to sort of wrap up. A few other key
16 points. As I've said we've evolved the document
17 rather substantially since March, in addition to the
18 use of NIST controls and certain protocols, we've had
19 extensive industry involved particularly in the
20 discussion of the types of controls that I'm talking
21 about.

22 We've also included a new part of the
23 document which you will see, Appendix A, which is a
24 generic cyber security plan template that licensees
25 and applicants can use as a basis to develop their

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 site-specific security plan; that the cyber security
2 regulations, 73.54, requires each licensee to submit
3 to NRC for review and approval by November 23rd of this
4 year.

5 So we've basically said, look, if the
6 licensee requirements of the rule say you've got to -
7 you, Mr. Licensee, have to explain to us, NRC, how you
8 are going to implement your program at your site?
9 What is your plan for implementation?

10 We have given them - we have given them a
11 straw man, that if they simply follow that will make
12 that job, that licensing job, much much easier. So
13 that is appendix A of the document. So that is new.
14 You didn't see that in your earlier version.

15 In addition I mentioned that we've had
16 extensive engagement on the part of the external
17 industry expertise, and unfortunately we weren't able
18 to have some of those folks here with us today. But
19 suffice it to say this thing has been poked and
20 prodded and looked at and examined from multiple
21 different angles with multiple different people, and
22 we have tried to incorporate their comments.

23 But generally speaking their comments have
24 been, this is great. This is exactly what you guys -
25 how the NIST document should be utilized. And NIST

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 encourages that we take their documents and you tailor
2 it to your specific need, whether you are a bank or
3 you are a pharmaceutical company or a nuclear plant.
4 So we've tried to do that, again, tried to leverage
5 success.

6 Quick, last thoughts. Reg Guide 5.71 is
7 written for an audience that is not your typical -
8 well, let me say it in a more positive way. The Reg
9 Guide is written - assuming that the reader has cyber
10 security knowledge and expertise. So you may read the
11 document and not fully grasp some of the nuances or
12 concepts that are built into the document. And that
13 is because there is an underlying assumption that it
14 is written for cyber security professionals from the
15 start.

16 Number two, the vulnerability analysis I
17 touched on earlier, there was a fair amount of
18 discussion about vulnerability analysis, and it's use
19 or potentially lack of use at the subcommittee
20 meeting, and I wanted to hit that head on here.
21 Vulnerability analysis is a good thing - we recognize
22 that. And in fact it is incorporated into this
23 document. But it's not incorporated in a way that you
24 might traditionally think about it. Specifically when
25 you think about doing a vulnerability analysis first,

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 and then saying, okay, what did that tell me? What
2 are the holes that I have to fill? What are the
3 things that I need to do to mitigate what the
4 vulnerability analysis is telling me.

5 And that's not how it's used in the
6 context of Reg Guide 5.71. Rather, vulnerability
7 analysis in the context of this particular reg guide
8 is to say, look, we start by applying the derived
9 security controls from NIST. Then you use tools such
10 as vulnerability analysis tools, some of which are
11 automated tools, some of which are hand-over-hand
12 table top evaluations. But you then do your
13 vulnerability analysis to examine how effective are
14 these controls that I just put in.

15 So vulnerability analysis is captured, but
16 it's done in a slightly different way than you might
17 ordinarily think about it.

18 Lastly, we ought to think about security,
19 not only cyber security but physical security,
20 information security, personnel security. We like to
21 think about all the requirements and controls and
22 programs and regulations and guidance, and all that we
23 do is security space as fundamentally being a couple
24 of things. Perhaps the most important is, ensure that
25 all these assumptions we make, all the designs that we

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 build, all the things that we do to ensure that the
2 safety side works, we - the security program is there
3 to preserve all those assumptions; it's there to
4 preserve those designs such that they are utilized and
5 respond in ways that they were designed to respond.

6 The minute your - they are not designed in
7 ways that consider malicious activity which the
8 general design criteria of Appendix A to Part 50 does
9 not include malicious attacks as part of your thinking
10 when you are doing design work. So everything in Part
11 33 is about preserving what we try to accomplish in
12 the application of the requirements in Part 50.

13 I wanted to leave you with that thought.
14 It's important, because again, it goes to this idea of
15 failure modes that are a result of equipment failures,
16 or human errors, or potentially environmental events,
17 but none of which are malicious. All the malicious
18 stuff is handled through the security programs, which
19 I've already said, can't be done exclusively through
20 design. It has to be done - design is a piece of it,
21 certainly, but it's not the whole story.

22 So with that, the team again, and you've
23 indulged me for over 15 minutes now, and I do
24 appreciate it, the team has developed a brief overview
25 of the construct of the reg guide, especially some of

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 the principles that are embodied in there, and will
2 embellish on some of the things that I brought up.

3 Most importantly they are going to walk
4 you through a real example of how the document and the
5 guidance that's in the document would be applied to a
6 real system.

7 So with that let me introduce Eric Lee,
8 Karl Sturzebecher and Michael Shinn, who have been the
9 principal authors and architects of this process.
10 Take it away.

11 MEMBER SIEBER: Well, let me comment a
12 little bit. The reg guide as you have it now is very
13 general in nature as I read it. And I think in my own
14 opinion I think that is appropriate, because if it
15 were to be more specific, that would be a perfect
16 guideline --

17 MR. MORRIS: A roadmap to success for an
18 adversary.

19 MEMBER SIEBER: That's right. And that
20 would unnecessarily focus the utility on certain
21 aspects of the design to the neglect of other aspects
22 of the design. I have taken the time to talk to a few
23 people who are in this business, and discuss the kinds
24 of things you are proposing and said, if you had this
25 set of rules, what would you establish as your

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 practice. And they basically said, these rules don't
2 tell me how to practice my trade, because it's like a
3 chess game. You have the licensee on the one hand,
4 versus another person with mal intent who is
5 determined to in. And they probe various avenues
6 until they are successful.

7 If you have an inflexible program you
8 can't respond to that, as I see it. And I've been
9 told that way. And my first impression was, you are
10 not specific enough in your reg guide to tell people
11 what to do, and what you expect from them. But others
12 who work in this trade tell me that once you build
13 this framework of what it is we are supposed to do,
14 that reveals to everyone else where the
15 vulnerabilities may exist.

16 And another suggestion that has come up
17 from time to time is the use of a pilot program
18 before you establish this as a rule across the
19 industry. It's not clear to me, in random situations
20 that occur which are intentional but may not occur
21 through the pilot plan, what that would actually show
22 you. And if you could as you go through your
23 presentation keep your thoughts in mind, and tell me
24 whether these thoughts are the right thoughts or not
25 the right thoughts, I would appreciate that. That

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 would clarify it for all of us.

2 MR. MORRIS: You are absolutely right.
3 And I'm not going to take much time at all, but simply
4 to say that with security you are never done; you are
5 always dealing with intelligent, malicious
6 adversaries, who in spite of what you do is going to
7 find another way what you've done. And that I think
8 is the essence of what you are saying.

9 MEMBER SIEBER: It's a chess game that
10 never ends, and there will be a winner and a loser.

11 MEMBER BROWN: I've got - I can't resist.
12 Sorry I was not at the meeting, because I was just
13 recovering from being in the air. I just got back
14 from 13-hour time zones, so unfortunately I missed the
15 meeting on Friday. But I did read the reg guide last
16 couple of days. And the comment about the
17 maliciousness, I totally - I don't disagree with that,
18 external, internal, whatever it is. But fundamentally
19 I don't group nuclear power plants in the same
20 category as I do banks, credit card companies, all
21 others who want information who throughout the world
22 under any circumstances have customers come in and be
23 able to change do whatever they want. They are
24 totally different. You don't have to have information
25 flow outside of the nuclear power plant, of the power

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 plant, on this same basis.

2 And you've got, obviously you want
3 communications within the plant. And there are
4 certain systems where the basic protection against
5 malicious intent is isolation. You don't let it get
6 out, and you don't let --

7 MR. MORRIS: That is my favorite one.

8 MEMBER BROWN: If you don't let it in,
9 then that's - then all you have to deal with
10 fundamentally is internal, an operator or somebody has
11 a malicious thought process, and if they turn a switch
12 they do - and there are other design things that you
13 put in - if you bypass a system an alarm light goes
14 off, or red warning light or something like that. And
15 you may miss a few, but you will find those as you go
16 through your operational status.

17 So isolation is a major tenet of this. So
18 where you break - and there are tons of procedures,
19 processes, reviews, controls, and I'm just looking at
20 this from the paperwork burden, of managing this, for
21 the operators, from the utility standpoint, there is a
22 lot of good stuff in here. I'm not disagreeing with a
23 lot of the detail. It's the level to which we go.
24 And I would look more to a framework to be developed
25 such that fundamentally you look at what are your

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 really critical systems, you isolate them. Then your
2 configuration management, and then you have access
3 controls. There are three fundamental I call them
4 pillars of protecting data and information in systems.

5 So that's what I miss when I look in here.

6 It was process, process, paperwork, reviews, method,
7 method, paperwork, more paperwork, and on and on, and
8 there is a lot of it in there.

9 MEMBER APOSTOLAKIS: There is one hour
10 left.

11 MEMBER BROWN: I will stop now.

12 MR. MORRIS: If we can't answer those
13 issues by the end of today then we will have failed.
14 Because I can assure you what you are mentioning is in
15 there. Now whether it's clear on first read that is
16 arguable.

17 MEMBER BROWN: Well, I just wanted to
18 give you a calibration of what I was thinking, that's
19 all.

20 MR. MORRIS: All right, Eric, Karl.

21 MR. STURZEBECKER: All right, we are
22 going to go through just as quickly as possible, we
23 are going to review the enhancements that we made to
24 the reg guide since the last time.

25 Here's the overview of the Reg Guide 5.71,

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 and do an actual example to show you why the security
2 controls and the strategy we are talking about.

3 The guide has a new framework. It's
4 basically to establish and maintain, when you read
5 through it. It's simple, it's linear, it also has the
6 deterministic methodology that we are using from NIST,
7 and we adopted 18 families from NIST, and another
8 family from DHS, and we are using those as
9 countermeasures in the application of whatever CDA or
10 critical digital asset that you have that you are
11 trying to protect.

12 The third bullet is to provide full
13 spectrum security controls. And what that means is
14 that you have three ways of applying specifically the
15 technical controls. If you can't apply it you have
16 to find another countermeasure that is equal or
17 better. And the other, finally, is if you don't need
18 it you explain why. And that's part of the process
19 for that. So it's self tailoring.

20 The fourth bullet, it details guidance and
21 examples to meet rules. From the ACRS letter, we
22 followed that instruction and added more into the
23 guide to try to show how you go through the stages of
24 establishing your cyber security program.

25 We have addressed the difference between

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 the digital instrumentation controls and the IT
2 systems. The controls we've taken, that we have
3 adopted, we've sat down with industry and gone through
4 and nuclearized them, quote unquote. So they are
5 adapted for nuclear sites and facilities.

6 The defensive architecture now has a new
7 section in Appendix C with more details, how you set
8 that up. And we have security lifecycle enhancement,
9 and that is basically when you are maintaining your
10 program, you have to constantly monitor and approve
11 what is going on in your security baseline to make
12 sure that whatever security assets you have in there
13 that they are up to par and meeting with the constant
14 changing adversary.

15 And finally there is a security template,
16 and as Scott explained before, that's where the
17 licensing act goes.

18 I'll briefly go through the steps that the
19 guide takes you through. You form your cyber security
20 team. Everybody has to have a sponsor, and it's a
21 diverse group of people, from the site. And then you
22 go through and you identify your critical digital
23 assets, and as you saw in the guide there is a flow
24 chart where you take all your systems and you step
25 through that flow chart, how about your critical

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 systems, and then pass through again to find out what
2 your CDAs are.

3 And then finally there is the defense in
4 depth protective strategies. There are three basic
5 strategies. These are conceptually, they are
6 integrated together.

7 The first one is after you've selected
8 your CDAs, or realize what they are, you drop them
9 into the boundaries, and we have - the guide shows a
10 Level 4 to a Level 0. And you drop it into Level 4.
11 And then we have a second strategy --

12 MR. LEE: One point that I would make,
13 Dr. Brown, is that you mentioned --

14 MEMBER BROWN: Thanks for the doctor on
15 that? I'll take it, go ahead.

16 MR. LEE: Is that you have mentioned
17 about the isolation.

18 MEMBER BROWN: I saw your diagram at
19 Level 4, 3, 2 1, 0. I know what he is talking about.

20 MR. LEE: This is where we talk about
21 that isolation. And we absolutely agree with you,
22 everything you said. And some of the elements that
23 you just talked about, about the access control. The
24 one thing that may not be very clear about this
25 document is that in order to make this document short

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 and sweet, what was did was, all those concerns that
2 you mentioned about access control and things of that
3 nature, we moved that to Appendix B and C.

4 MEMBER BROWN: I saw that.

5 MR. LEE: So it does address access
6 control, meaning that Section 3.1.6 says that apply
7 all security control, meaning to address all the
8 security controls. So they have to look at the
9 security controls. And one of the elements out of
10 145, over 145 security controls, is that.

11 MEMBER BROWN: You said the magic word,
12 145 security controls that you apply.

13 MR. MORRIS: Hold on, Erik, let me take
14 that on.

15 MEMBER BROWN: It's a lot.

16 MR. MORRIS: It is, however, in order -
17 what we are asking for in terms of documentation - and
18 you mentioned paperwork - what we are saying is, by
19 adopting these controls there is a minimum amount of
20 paperwork. You just say yea, barely, they are
21 adopted, period. If you want to do something
22 different, take credit for some design feature, take
23 credit for some site specific, I mean whatever, that
24 is where the documentation begins to say, well, you
25 know, I don't want to put that control in, and here is

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 my justification. We are okay with that.

2 The converse is, to start with a
3 vulnerability attack vector kind of analysis, you are
4 going to have to document all of that.

5 MEMBER BROWN: No, I'm not talking about
6 the vulnerability.

7 MR. MORRIS: Well, you mentioned
8 paperwork and the volume of paperwork. I'm simply
9 saying that by this methodology we'll minimize - I'm
10 not saying it's a trivial amount of documentation, but
11 it is far, far less than what we would expect under
12 the alternative approach.

13 MR. LEE: My point that I would like to
14 make is that what we are talking about, 145 security
15 controls, these are like per system, systemic, root
16 cause for I guess system compromise. So what we are
17 saying is that you think about these. So just like
18 what you have mentioned about isolation, some of these
19 root causes may be addressed by like access controls,
20 all the system isolations, and the way we are allowed
21 them to address in this document, and we have gone
22 through this, with industry, I guess over a month
23 period. We talked with technical folks; we talked
24 with the licensing folks; and we again talked with the
25 licensing and technical folks. And throughout the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 last six months period. And we talked about
2 implementation, documentation, how they could address
3 some of these issues.

4 MR. STURZEBECHER: There is an inherence
5 aspects, that if you are behind a particular boundary
6 you can inherit that protection. The other side is, I
7 know you're saying it's a lot of documentation, and
8 maybe not necessarily; but it's also an incentive that
9 says that you should be isolated. But the other
10 aspects when you look at the problem it's very
11 complex. I could walk into this, plug in, and don't
12 even know it, and I got the slammer work on a high
13 level system.

14 MEMBER BROWN: But that's access control.

15 MR. STURZEBECHER: It's access control by
16 policy.

17 MEMBER BROWN: Will it be covered, when
18 you design a system, a digital system, you can control
19 access control electronically as well, or you can
20 alert somebody if somebody makes access to it. It's
21 not all that hard to do. If you are bringing in a new
22 digital system, if it's an existing one, it's more
23 difficult to back fit, because you got software
24 changes, blah blah, all that other stuff. If you are
25 putting in a new system, as most of the plants are

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 trying to do today, those - I don't disagree, the
2 aspects are, you want to start at the beginning and
3 design it so that you don't have those types of
4 problems, and that - I'll stop.

5 MEMBER APOSTOLAKIS: Is there a place
6 where you are investigating whether licensees expected
7 to document what the impact on safety might be of all
8 these security controls?

9 MR. SHINN: Yes, in two ways, Dr.
10 Apostolakis. There are two elements. The first one
11 is the safety element. There is a requirement that
12 when you look at a control you have to consider what
13 the impact will be by implementing that control on the
14 safety, security and emergency preparedness function.
15 So there is a requirement that the implementation of
16 a control not have an adverse impact. So that is
17 number one.

18 Number two is that you have to actually
19 measure the impact of the vulnerabilities, whatever
20 they may be, in your program, even once the controls
21 are implemented. So there is two sides to that.
22 That's I think the way the industry put it. Don't be
23 maliciously compliant, don't implement the controls in
24 a way that disrupts the safety program.

25 MR. MORRIS: Let's take it out of the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 abstract. You're in a control room. You've got a
2 digital based control system. And if you implement
3 every control that is in our reg guide that wouldn't
4 necessarily make you put, after X amount of minutes go
5 by, that locks you out of your system, and now you got
6 to enter a password to -- I can't scram, because I got
7 to enter my password first. That's absurd; you don't
8 want that. That's what we're talking about.

9 (Simultaneous speakers.)

10 MR. LEE: Actually we created that
11 particular one in there, and we actually went through
12 each and every single one of these items and talked
13 with the I guess the practitioner, licensee, technical
14 folks that were down here one week. And we went
15 through every single one of them and how they could be
16 implemented.

17 So just like Scott has stated, originally
18 Scott nuclearized the NIST standard, then we met with
19 the industry folks, the technical folks and see if
20 they can do this, or how they apply. So we
21 implemented these, that they mentioned various
22 systems, and because of these systems we have to do it
23 this way, that way, so we tailored it just like
24 Appendix I of the NIST standard specifically said that
25 for an industrial control system you need to tailor

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 it.

2 So we even actually met with Dr. Abrams to
3 look at the document. And we talked to him, and he
4 was very excited that we did it right.

5 MEMBER APOSTOLAKIS: Okay, let's go on.

6 MEMBER POWERS: I can't completely
7 understand how anyone of these strategies you listed
8 up here constitutes defense in depth.

9 MR. MORRIS: We haven't got there yet.
10 We are going to walk you through how that works.

11 MR. STURZEBECHER: So the second strategy
12 listed up here is about applying these security
13 controls, these over 145, and that is also coupled
14 with the physicals, because sometimes you do share
15 either one or both.

16 And then third is maintain your cyber
17 security program which is a strategy in itself to keep
18 the system up.

19 So what I'm going to show here is an
20 example, and it's an application of the first two
21 strategies. And I have a fictitious reactor
22 protection system here. An Ethernet to a switch, it
23 goes out to the plant's data network and is connected
24 to an HMI, an engineering work station, human-machine
25 interface.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 So the team gets together and first
2 determines what the critical systems are, and the
3 CDAs, they use the flow chart and step through, and
4 the RPS comes up as performing what you call a safety
5 or security or emergency preparedness function.

6 You do it again, you follow through with
7 the system using the flow chart, and you come up with
8 the other two particular assets here. And the switch
9 falls into the second diamond, which is, it has a
10 pathway effect on this particular critical system.

11 The HMI, the engineering work station,
12 comes up as an importance to safety, it communicates
13 with the RPS.

14 MEMBER BROWN: A non-safety related one
15 communicates with the RPS?

16 MR. STURZEBECHER: That is actually what
17 we've heard from the industry. They will call that a
18 non-safety related item. We overstep every bound. We
19 don't really care what you call it; we look at
20 everything.

21 MEMBER BROWN: Well, I understand that,
22 but they are actually saying we are going to have
23 these non-safety related things communicate back to
24 the RPS. That is non-one-way communication, so that
25 is actually up in Level 2 in your diagram.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. SHINN: That is a great question.
2 Thank you for asking, because that is Karl's next
3 theme.

4 MR. STURZEBECKER: If you apply the
5 defensive strategies that we have, and you deploy how
6 you are going to put this in a logical architecture,
7 you are going to put this entire highway, into Level
8 4.

9 MR. SHINN: And you put the one-way diode
10 in place to isolate the assets.

11 MEMBER BROWN: So where would their one-
12 way part go?

13 MR. SHINN: The little diode diagram that
14 you see there?

15 MEMBER BROWN: I just turn the page,
16 thank you.

17 MR. LEE: The equipment part, Mr. Brown,
18 is that the switch and the importance to safety
19 function is that the man-machine interface is a
20 Critical Digital Asset per our definitions. Because
21 that HMI, our understanding is that it provides set
22 points and things of that nature so that it could, it
23 is important to the safety system for performing its
24 function properly.

25 So it provides two things. First you see

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 it provides a pathway to the safety system, or it
2 could adversely impact those functions. So that's why
3 there is an other than non-safety systems in our view,
4 they are critical systems.

5 MEMBER BROWN: Oh, so their comment was
6 that that should be set points for their protection
7 systems that are in the HMI in the engineering
8 stations as opposed to reactor protection system?

9 MR. STURZEBECKER: It is where you upload
10 them.

11 MEMBER BROWN: So they want to use the
12 main control room to download stuff down to their
13 cabinets that are sitting wherever they are within the
14 plants. That's what they are doing.

15 MR. STURZEBECKER: That's possible,
16 depending on --

17 MEMBER BROWN: As opposed to carrying a
18 laptop down where you've got a secure access control,
19 non -

20 (Simultaneous speakers.)

21 MEMBER BROWN: The only point I'm making
22 is about plant design for critical safety systems.
23 Just because you can do it doesn't mean you should do
24 it.

25 (Simultaneous speakers.)

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MEMBER BROWN: We're telling them, if
2 they're going to do it what they have to do. That's
3 fine. I don't have any problem with that. I guess
4 one of my hot spots, and maybe I'm off base, because
5 I'm always off base, is that why is the NRC people
6 implementing these things that way where you have a
7 possibility of compromising critical safe guards and
8 protection systems, allowing these types of connected
9 systems to compromise you. Because you are not
10 allowed to tell them how to do it, is probably the
11 answer you are going to give me.

12 MR. MORRIS: At the end of the day the
13 performance standard is prevention of radiological
14 sabotage. And if there is a way the licensee can
15 demonstrate that they have high assurance that they
16 can adequately protect against that -

17 (Simultaneous speakers.)

18 MEMBER BROWN: They're going to put
19 little guys at the gate to look at the information
20 going back and forth.

21 MR. MORRIS: I personally happen to agree
22 with you. Don't even connect it to anything.

23 MEMBER BROWN: I'm fine, I understand
24 what you are talking about.

25 MR. SHINN: And we do say that in the reg

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 guide. We do say that isolation that is completely
2 disconnectible asset, is preferred.

3 MEMBER BROWN: All right.

4 (Simultaneous speakers.)

5 MEMBER BROWN: We got to get through
6 this, so why don't you go on.

7 MEMBER POWERS: What is totally opaque to
8 me, would you go back and explain the diagram to me.
9 Let me warn you that any letter that comes out of here
10 has to have the vote of all the committee members.
11 And you can speak to all of us. Because I guarantee
12 you right now you're going to get a no vote on me on
13 this part of it.

14 MR. STURZEBECHER: What questions do you
15 have?

16 MEMBER POWERS: A totally opaque diagram.
17 What are you trying to communicate with this diagram?
18 We're looking at 6A as I recall.

19 MR. STURZEBECHER: Well, okay, I
20 apologize for the printout on that.

21 MEMBER APOSTOLAKIS: Can you go back to
22 the previous?

23 MR. STURZEBECHER: I'll go the slide
24 that shows the four levels first.

25 MR. LEE: Back up a slide.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. MORRIS: What Karl was trying to
2 illustrate here is that everything you see in the
3 example so far is Level 4, and when you look at one of
4 the --

5 MEMBER POWERS: Levels of what?

6 MR. STURZEBECKER: A logical level of
7 protection.

8 MR. MORRIS: This is entirely consistent
9 with - I mean this is the same diagram that was used
10 in the previous version of our reg guide. It's
11 something that has been adopted by the industry
12 reaching all the way back to 2004. And what they are
13 trying to illustrate on this diagram is that you've
14 got multiple levels or multiple barriers of
15 protection. Level 0 would be your Internet, the
16 cloud, things that you have absolutely no control over
17 what goes on.

18 Level 1 you may be talking about your
19 initial corporate network that is linking to the
20 network.

21 Level 2 may be your site-based local area
22 network that is just available to people at that
23 particular site.

24 Level 3 is another ring of defense in
25 which you might have non-safety related

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 instrumentation and control systems.

2 Level 4 is where we would like to see most
3 if not all of the things that we have defined as
4 regulation as critical digital assets. And if you
5 look at the large white arrows on there, what we are
6 trying to illustrate is that if you are going to
7 connect something that is a Critical Digital Asset in
8 Level 4 to something in Level 3, some convenient
9 operator display, perhaps not safety related but
10 available to operators or maintenance technicians or
11 the system engineer out in the engineering building,
12 you want to have real time information about the
13 status of that particular device or asset. There is
14 going to have to be some kind of connection.

15 So what this model and the architecture is
16 saying, to the extent you are going to have that
17 connection, it better doggone well be a one-way
18 connection. And that is why what Paul is trying to
19 illustrate, and now I'll go back to the other, is that
20 data diode is how you enforce that access or one-way
21 communication. And what I heard Mr. Brown say - I
22 almost called you doctor - is, well, wouldn't it be
23 better to just simply isolate that? And the way I try
24 to answer that --

25 MEMBER BROWN: No, I didn't say that. I

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 understand you are going to have to send data out to
2 the next level.

3 MEMBER APOSTOLAKIS: Let's put something
4 out here. Is this example in the guide?

5 MR. STURZEBECKER: No, it's not.

6 MEMBER APOSTOLAKIS: The main problem
7 that I think some of us have with the way that it is
8 written is that I think Charlie put it in a different
9 way, but it asks for plans and processes. All over
10 the place. And there is no - there is no guidance
11 that I can see to the inspector that says, yes, this
12 process is acceptable. The inspector will have to
13 decide what is acceptable. I don't have any question
14 in my mind that you gentlemen can pick a problem, an
15 example of this, and work through it, but what does
16 that prove? I mean yes, you can do things and so on,
17 but the regulatory guide essentially asks for give me
18 a plan, give me a process, a policy, give me this,
19 make sure you have this team. And then it's real
20 similar to a problem we had a number of years back
21 when we were talking about digital I&C. Where the
22 staff came back, and I fully agreed with them on the
23 state of the art, I mean we are not asking you to
24 perform miracles here. And they said, all we can do
25 is control the process of production of the digital

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 system, and then we hope that it will be highly
2 reliable. Because there are some tests and so on.

3 So here too it seems the fundamental
4 assumption is that if you have all these policies and
5 processes you have adequate protection, and I'm having
6 a problem with that. I think it's a jump. Give me
7 one example, just demonstrate that you know how to do
8 things. What would the poor inspector do?

9 MR. MORRIS: This isn't going to be
10 satisfying to you, but this is precisely how we do it
11 in physical security space. We don't dictate to the
12 licensees how to build their vehicle barriers. We
13 don't dictate to the licensee how their intruder
14 detection system should be designed and implemented.
15 Rather, we say, that the vehicle barrier must be able
16 to stop a vehicle at a certain rate, carrying a
17 certain payload, traveling at a certain speed with a
18 certain ground clearance. You, Mr. Licensee, have to
19 prove to me that when I come at you with that that
20 your barrier is sufficiently robust, it's located in a
21 proper location so that if the bomb goes off in that
22 location, the over-pressure that results won't impact
23 safety-related systems. It's just the model that is
24 utilized, and it's entirely consistent with that.

25 MR. LEE: And also, the way we have

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 written this regulatory guide is that because we
2 wanted to make it short and sweet, the way we wrote it
3 was that the main body of the regulatory guide
4 provides I guess a process for implementing secure
5 controls provided in B and C. So we can't just look
6 at the regulatory guide as just the front end part.
7 You have to include the whole body including our
8 policies.

9 MEMBER APOSTOLAKIS: I don't understand
10 your statement. You think I just read the front part?

11 Why do you say that? I read the whole thing. And in
12 fact, there is some specific advice, I don't doubt
13 that. But if you look at the main thrust of the
14 document it says, give me a policy, give me a plan.
15 Now if this is a standard practice in this field, then
16 maybe --

17 MR. MORRIS: With all due respect it's
18 more than that. It's not just give me a policy, give
19 me a plan. The policy has to be based on established
20 principles, established standards that we know work.
21 Then when the inspector comes out, and there is a firm
22 commitment in the licensing document that says, this
23 is how I'm going to do it. This is the criteria I'm
24 going to use to make that determination. And when
25 your inspector shows up at the site, I'm going to be

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 able to produce documentation and real evidence and
2 show you how it's constructed that proves that I built
3 it exactly consistent with my commitments in the plan
4 that you, Mr. NRC, approved. And it's up to the
5 inspector at that point, the burden is on us to say it
6 doesn't work. And that is performance based.

7 MEMBER APOSTOLAKIS: Aren't you placing a
8 lot of burden on the inspector that way? What is it
9 that guarantees that you are going to have some
10 consistency from plant to plant and inspector to
11 inspector?

12 MEMBER BROWN: Maybe an IT expert.

13 MR. MORRIS: Well, I can speak to the
14 inspection criteria, because we actually do have a
15 detailed inspection criteria in the federal government
16 to do this. It's three, four, maybe even 500 pages
17 long now. It actually describes specifically, because
18 of the issue you just brought up, Mr. Brown, the
19 question is, how do you know you'll have consistency.

20 MEMBER CORRADINI: Let me make another
21 comment. Much of the discussion today it seems to me
22 has been a continuation of the subcommittee meeting.
23 And I think that's a disservice to the members that
24 were not at the committee meeting. So therefore we
25 have listened to the end point of a presentation that

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 we never had. I would suggest that we just pick up
2 and continue the presentation, and then these issues
3 can be raised in a form at the end so that we can all
4 participate in that.

5 MR. LEE: Actually I would like to
6 comment. I didn't mean it that way. Sometimes it's
7 difficult to - so I apologize.

8 MEMBER APOSTOLAKIS: Okay, well, I think
9 you have to use your judgment. You can't go over
10 every -

11 (Comments off the record.)

12 MEMBER APOSTOLAKIS: Okay, keep going.

13 MR. SHINN: So after you have deployed
14 the CDAs in this defensive architecture, this logical
15 defense architecture that we are talking about, I
16 didn't show level three because of the slide, but for
17 this application, this example, I'm just showing Level
18 4. You go to the next step in the guide where you
19 apply all the operation and management security
20 controls, and then you go to addressing the technical
21 security controls for each CDA.

22 And in this process we are back to the
23 idea of the self tailoring, where we are going to use
24 an example of authentication like user name,
25 passwords, for the RPS. The authentication if you

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 could apply it on the RPS you're done. If not, you've
2 got to go to the next step where you need to look at
3 items within this particular system apply to the
4 authentication. In this case we are showing an
5 example here where you put the user name
6 authentication on that, important to safety, HMI, and
7 you also may use physical security to protect the
8 entire battery.

9 If you cannot - well, you don't have to
10 use the - on this case it's authentication applicable,
11 but in other cases you may not use the security
12 control. You don't apply it at all.

13 Addressing all security controls for each
14 CDA, you test the vulnerabilities and ensure
15 effectiveness. You go through and scan.

16 MEMBER APOSTOLAKIS: Now let me ask you
17 something. This is really very important. Because
18 the issue of a pilot application was raised earlier by
19 Mr. Sieber. Wouldn't the regulatory guide benefit by
20 taking what you have now, try it on a number of plants
21 for a year and a half, two years, get examples like
22 this from the licensees, then draw some conclusions,
23 and put them into the guide. I mean it seems to me
24 that would be very beneficial, because you are doing
25 it this way in this particular example, maybe other

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 people would do it in a different way. And then you
2 would start gaining insights as to how these policies
3 and plans could be implemented. And again the intent
4 here is not to ask you to advance the state of the
5 art. We can't do that. We recognize that. We are
6 trying to find ways of doing the best job we can
7 right now. So it seems to me that would be very
8 beneficial.

9 Now Mr. Sieber said that you may not have
10 attacks on these pilots. That's not the intent of a
11 pilot. It's not to actually see whether they attack
12 me and I protected myself; the intent is to see the
13 implementation of these plans that we're demanding.

14 I think we should have two or three
15 difference licensees do analyses like this, try to
16 implement it. You would probably benefit and gain
17 some insights that would make the regulatory guide
18 stronger. That's all I'm saying.

19 MR. MORRIS: If I could respond, I think
20 that might have - I don't deny that that might be
21 beneficial. But the hand that we've been dealt, like
22 it or not, is that on November 23rd of this year by
23 regulation there is a requirement that all licensees
24 submit to us a plan for how they are going to
25 implement this rule. I can't maneuver around that.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 So what we have done is come up with, working the most
2 collaborative way, engage the best people we could
3 find, and put all the best minds together, to come up
4 with the best most efficient least amount of burden
5 process to make it work.

6 And unfortunately that's where we are.
7 I'm not disagreeing with your suggestion. It's just,
8 I hate to say it, but that ship sailed.

9 MEMBER BROWN: So this is what they are
10 using right now to prepare the November 23rd, by law,
11 of regulations, whatever the rule is.

12 MEMBER APOSTOLAKIS: First of all
13 November 23rd I'm not sure it constrains us. And I
14 appreciate that you have a problem. Would you revise
15 the guide a year from now?

16 MR. SHINN: Sure.

17 MR. MORRIS: In fact we don't pretend
18 that this thing is perfect by any stretch. I mean we
19 think it's adequate. We think it's appropriate.

20 MEMBER APOSTOLAKIS: Okay, let's keep
21 going. Let's keep going, because I think you answered
22 my questions.

23 Who said November 23, the Commission?

24 MEMBER BROWN: This is regulation and not
25 a law , is that correct? Is that a rule?

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. MORRIS: Actually they effectively
2 are the same, because Congress elevated the NRC to the
3 ability to make laws for nuclear safety.

4 MEMBER APOSTOLAKIS: No, but it's a
5 direction from the Commission. It's not part of the
6 rule.

7 MR. MORRIS: It is not in the guide.
8 It's part of the regulations. It's in the rule.

9 MEMBER APOSTOLAKIS: It is in the rule?

10 MR. SHINN: It's hardwired into the rule.

11 MR. STURZEBECKER: All right, so the
12 next step is to complete documentation for
13 inspections. Then you go to maintaining the cyber
14 security program.

15 MR. MORRIS: So defense in depth, back to
16 Dr. Powers question, the defense in depth - we want
17 to remove the opacity here. The first level of
18 defense in depth again is this idea that you are - I
19 want to make sure I'm using the same words.

20 (Comments off the record.)

21 MR. MORRIS: The first strategy is this
22 model, adopt this model. You've got layered defenses
23 to start with. The second layer is the application,
24 once you've built this model and you've populated the
25 model with your digital assets, that need to be

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 protected, is to apply the security controls that are
2 in appendix B and C of the reg guide, of course
3 tailoring to your specific application. You know,
4 don't put passwords on scram buttons and stuff.

5 And third is what Karl is about to talk
6 about, now that we've built this model and I've
7 implemented all these controls, you're going to want
8 to maintain it through the lifecycle, and that is the
9 rest of the lifecycle approach to configuration
10 control and QA and all these other things.

11 MEMBER POWERS: How is that defense in
12 depth? It sounds like defense.

13 MR. STURZEBECKER: Well it really is a
14 security defense in depth type approach.

15 MR. MORRIS: It is a security paradigm.

16 MR. STURZEBECKER: You have layers, those
17 boundaries we were talking about before. If an
18 attacker or hacker is coming through you are going to
19 have different boundaries. Maybe the first couple of
20 boundaries may be a firewall with some sort of way of
21 detecting that the adversary is coming through. And
22 it should automatically, at the speed of light, so you
23 are going to have something, one of these technical
24 controls takes down that adversary, stops it from
25 getting any further, alerts you. You don't want any

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 further path. You need to know when you're being
2 perturbed or being moved into, because that is
3 typically the approach.

4 The other security controls that are
5 applied to each CDA, they provide that other level of
6 defense when like we used at dedication - I am trying
7 to think of a good --

8 MR. SHINN: Yes, if the poles are
9 overlapping and Karl mentioned address 19 families of
10 root causes that lead to cyber compromises, so those
11 cover everything from adequate training to the
12 dedication to various technical controls to incident
13 response, contingency plans. So that is another
14 strategy, another part of defense in depth.

15 MR. MORRIS: It is slightly more than
16 that, because as I tried to indicate at the outset, is
17 that you can't just design a system, implement
18 controls and then walk away from it and assume that
19 forever and ever it's going to be able to defeat
20 everything new that comes out. If that were possible
21 we wouldn't have Microsoft issuing patches for their
22 software every Tuesday. We wouldn't have - so as a
23 consequence that third level of defense so to speak in
24 this security paradigm is to be this active
25 monitoring, aggressive, forward leaning maintenance of

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 all these things, both from a threat evaluation,
2 vulnerability assessment. Do my security controls
3 still work today? Is it ongoing?

4 So we think of that in security paradigm
5 as a level of defense. It's not clearly tied into the
6 way we think about it as safety space, so to speak.

7 MEMBER POWERS: Well, it appears to me --
8 (Off-mic comment.)

9 -- between Level 0 and Level 1. And
10 associated with that firewall is some way so you can
11 detect when somebody is probing you. First level of
12 defense. The next level of defense is one of
13 increasing conservatism, but I don't know what it is.
14 You haven't told me what it is. It could be the
15 corporate -- from the next level.

16 MR. LEE: That is beyond the scope of our
17 evaluation.

18 MEMBER POWERS: Somewhere we are going to
19 get into your scope, because otherwise you don't have
20 a defense in depth.

21 MR. SHINN: Layers 3 and level 4 --

22 MEMBER POWERS: Okay, what's at Level 3?
23 A more conservative barrier.

24 MR. SHINN: Yes, so you are right, it
25 does get more conservative. So the boundary between 3

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 and 2 uses deterministic one-way technology. So now
2 we go from a firewall to something like a diode, which
3 is fundamentally more conservative, as you put it.
4 And like I said it's a deterministic technology, and
5 we spell that out in the guide, that once you get into
6 these higher levels, we expect the technology could
7 change, and to provide a higher level of certainty
8 that the data flow will be maintained in the direction
9 as illustrated.

10 MEMBER POWERS: When we go from three to
11 two, is there another barrier between four and three?

12 MR. SHINN: Yes.

13 MR. MORRIS: And again, that is also one
14 way.

15 MEMBER POWERS: That's what it says. Is
16 it diverse?

17 MR. SHINN: Yes, that's also a
18 requirement. Diversity is a requirement.

19 MEMBER POWERS: So you said the 4-3
20 boundary is not the same as the 3-2 boundary?

21 MR. SHINN: By utilizing diversity, yes,
22 it should be some different method of achieving that.

23 MEMBER BROWN: Now I understand your
24 defense in depth strategy. There are a couple of
25 ways to achieve that diode function. I'm just saying

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 you got to be aware that when they do this and
2 somebody inspects for it, it's not always obvious.
3 Some have used what I call software-based diode, in
4 other words they look at the stuff and determine if
5 this is good, bad, so it's a data evaluation process.

6 MEMBER POWERS: I asked them about a
7 strategy.

8 (Simultaneous speakers.)

9 MEMBER BROWN: Let me finish, I
10 understand that. The second point is the hardware
11 output, it's output only and it's a hardware deal.
12 You literally can't come back and you can't change it
13 unless you change the hardware. That's all I'm
14 telling you.

15 MEMBER ARMIJO: Does that diode between 4
16 and 3 constitute or meet the isolation goal or
17 principle that Charlie talked about?

18 MEMBER BROWN: Yes, I don't have any
19 problem with that if it's done the right way. If it's
20 -- I don't like them, because that can be compromised
21 by a good hacker. If it's a hardware based output-
22 only communication device, that's okay, not an I/O
23 device which can be fuddled with by software.

24 CHAIR BONACA: I have a question
25 regarding the sharing of information. The point that

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 Mr. Morris made is very important, is everyday you
2 have a new challenge, maybe new approaches to try to
3 get in. Do you have a process by which you
4 disseminate information within the community of
5 nuclear power plants?

6 MR. MORRIS: In fact yes we do. But in
7 addition to the normal process that we have had for
8 some time, as new threats arise that we become aware
9 of and our ability to share that information through a
10 number of vehicles including safeguards advisories,
11 threat advisories. In addition to that we have
12 recently issued an information notice, like two or
13 three weeks ago, which pointed out, reminded our
14 licensees that there are other sources of real time
15 information that they should be monitoring on 24/7
16 basis, or a routine basis, such as the DHS' US-CERT
17 website. There are a number of outlets that provide,
18 you know, information about newly discovered
19 vulnerabilities, newly discovered threat vectors. And
20 what the information notice says is, hey guys, if you
21 licensees are sitting around with your hands in your
22 pockets waiting for the NRC to tell you every time
23 there is a new problem you are making a huge mistake.
24 You need to be out there hitting these other
25 websites, talking to each other, in addition to

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 anything we might provide you. So yes, that's very
2 much so.

3 VICE CHAIR ABDEL-KHALIK: How does this
4 architecture protect against Trojan horses in Level 4?

5 MR. SHINN: Yes, the defensive layers
6 themselves essentially there are two scenarios in
7 which that Trojan data could enter, one is directly
8 through connections. The architecture by being one
9 way prevents that. The other way is it could be
10 carried into the environment or it could be built into
11 the product. There are actually controls in there
12 that deal with acquisition, but there are for lack of
13 a better words essentially quality control
14 requirements, and testing requirements that test the
15 technologies to determine to the extent possible that
16 those things don't exist, and that there are controls
17 in there to ensure that data that is moved cleanly to
18 that boundary is also checked and tested to ensure
19 that its integrity is intact and that there aren't
20 Trojans and what not.

21 And finally there are monitoring intrusion
22 detection requirements within each boundary as well to
23 detect these things, so if it ends up in the
24 environment it will be detected. And then of course
25 there are incident response requirements to deal with

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 it, if it were to occur, and contingency plan
2 requirements, should the worst case scenario occur.

3 MR. MORRIS: The most insidious attack
4 would be one in which there's something built into the
5 hardware or software that is acquired from a vendor,
6 and we spend about two or three pages, I think of
7 Section C(12) going through the processes which the
8 licensees should go through as they interact with
9 their vendors, and the folks that they are acquiring
10 these products and services from, to try to root out
11 as much of that problem as you can. I mean you are
12 never going to achieve protection, but again it's a
13 question of adequacy, it's a question of adequate
14 protection, not perfect protection.

15 So we feel those controls are appropriate
16 when you add them with all the other things we are
17 doing in the defensive model that gives us assurance
18 that we are looking for.

19 MEMBER BROWN: On that part of it, that's
20 been another configuration control of the equipment
21 and systems you have at the plant. And I saw the part
22 on the vendor part of it, but to me there are two
23 pieces of this, and correct me if I'm wrong. Number
24 one, the guy is developing something, designing
25 something, you're going to take it and put it in.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 You got to make sure it comes out of this plant okay.

2 The second part is managing the
3 configuration of the stuff in the plant itself. You
4 said there's a separate methodology, a separate
5 different - you have to address it. I didn't see the
6 implant where it was clearly - maybe it's in there.

7 MR. MORRIS: It's a big document. It is
8 in there.

9 MR. SHINN: Yes, your point is right on.
10 The second bullet there is change controls is a major
11 --

12 MEMBER BROWN: That's what you mean.
13 That's at the plant level.

14 CHAIR BONACA: How do you assure that the
15 software in the - inaccessible software is maintained?
16 What I'm trying to say is, the example was made of
17 our programs being routinely upgraded by Microsoft
18 automatically. And there, even at the commercial
19 level, you have a need for continuous protection.
20 Since you have the isolation of your hardware, where
21 you have the inner circle, I will call it, how do you
22 maintain that software?

23 MR. SHINN: So if I understood you
24 correctly -- please correct me if I didn't -- the
25 issue of essentially remediating flaws.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 CHAIR BONACA: Actually, the issue of
2 updating to make it more robust and more defensive of
3 information.

4 MR. SHINN: Yes, that is covered in the
5 plan as well. And because there is a great deal of
6 acceptable scenarios. We have a number of different
7 controls to address this based on different scenarios
8 that may occur in the plant. For example you may have
9 a system that has older software on it, but it is
10 appropriately isolated such that it doesn't need to be
11 patched for these particular vulnerabilities because
12 they are mitigated through other security controls.

13 But there may be another system where
14 those patches have to be installed. And there is a
15 requirement that those patches be properly tested, not
16 only to ensure that they mitigate the security issue,
17 but that they don't adversely impact the safety,
18 security, emergency preparedness functions.

19 MEMBER APOSTOLAKIS: Let me intervene
20 here. Karl, you are not going to go through all your
21 slides. Can you speak to the ones you want and go
22 over them, so we make sure at least at the end - if
23 you're done, you're done.

24 MR. STURZEBECKER: We're almost to the
25 end.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. MORRIS: I think we're done.

2 MEMBER APOSTOLAKIS: Okay.

3 MR. MORRIS: I don't think we should
4 spend any time on the template itself. The template
5 is essentially what we are asking for in licensing
6 space. And then the specifics --

7 MR. STURZEBECHER: And that is the
8 summary. So this is what the guy does and addresses
9 this adversary we've been talking about.

10 MEMBER APOSTOLAKIS: Right. I have some
11 - this really creates a lot of headaches. What is it,
12 70.54?

13 MR. STURZEBECHER: That's right.

14 MEMBER APOSTOLAKIS: It says the
15 licensees as I recall should have a cyber security
16 program up through the design basis threat. Now what
17 is the design basis threat got to do with cyber
18 security?

19 MR. MORRIS: It is the basis upon which
20 the entire protective strategy is grounded on.

21 MEMBER APOSTOLAKIS: But is the DBD
22 really addressing physical security?

23 MR. SHINN: Absolutely.

24 MR. MORRIS: But it included - the design
25 basis threats, and I'll be careful not to get into

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 anything that is not publicly available, is basically
2 a set of adversary characteristics which include
3 number of adversaries with knowledge and skills that
4 they have; the tactics that they can employ; the kind
5 of equipment and weaponry that they can use; the
6 vehicles that they can use. In order to do - to try
7 to create a radiological sabotage event. And 73.1,
8 which this language is a part of, essentially say s,
9 okay, here's all the stuff the bad guy can do to you,
10 and here is your plant. You better put something
11 between the bad guy and the plant to make sure that
12 this guy can't create radiological sabotage, and that
13 includes information security controls, personnel
14 security controls, physical security controls, and
15 now, cyber security controls. So it's the whole set.

16 MEMBER SIEBER: But 73.1, the only
17 mention of cyber security is to use the words at the
18 end of that list. It doesn't tell you any thing.

19 MR. MORRIS: And it's for the reason you
20 mentioned earlier, because if you give any more detail
21 than that you are basically telling the bad guys
22 precisely what it is if they have a work around, or
23 you just do one more thing around that and the
24 licensee is not going to be able to deal with.

25 MEMBER APOSTOLAKIS: I can see a

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 definition of a design basis threat when it comes to
2 physical stuff. Cyber security, I don't know. Yes,
3 you can have a smart kid in Malaysia doing a hell of a
4 lot of damage.

5 MEMBER SIEBER: If this were an
6 engineering issue, it would be solved. But it's not;
7 it's a human malevolent issue.

8 MEMBER BROWN: That is correct. That's
9 it.

10 MEMBER MAYNARD: You mentioned some of
11 your interaction with the industry. Are there any
12 hard stops with this reg guide that remain between --

13 MR. MORRIS: In terms of the security
14 controls, I would suggest largely no. In terms of the
15 process by which critical systems and critical digital
16 assets are identified and incorporated as part of the
17 scope of the program, I would say no.

18 As far as how the security controls are
19 applied and some of the nuances of the defensive
20 architecture itself, I would say there are some hard
21 spots. We are working through those, but again the
22 alternatives aren't very attractive. Trying to work
23 through attack vector analyses assumes that you know
24 what all the attack vectors are to begin with, and
25 that is simply not possible. So it gets very

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 difficult. I would be lying to you if I said that
2 industry is completely on board, and understands every
3 thing, and just smiling and happy. I mean security is
4 very difficult in and of itself, simply because we are
5 dealing with a malicious intelligent adversary, and
6 you are never done. I mean you are just never done.
7 For that reason security will forever be a challenge,
8 particularly in an industry where they are trying to
9 make money. And so cyber is I would argue an order of
10 magnitude more difficult because we are dealing with
11 an area in which there isn't a lot - there isn't a
12 vast population of people who understand digital I&C
13 network security . Our reliance on folks like Michael
14 - and it is a challenge, and there are a lot of
15 unknowns. And it is more difficult, it really is, and
16 it makes our job more difficult to explain not only to
17 the public, but also to ensure that the industry
18 understands what we're looking for to achieve high
19 assurance of adequate protection.

20 MEMBER CORRADINI: So I had a question,
21 just to interject, maybe you said it when I was out of
22 the room for a few minutes. So the inspection process
23 for this new added - are the same set of inspectors,
24 or an addition to a team of inspectors that go - the
25 one thing in the back of my mind I guess that you had

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 brought up awhile ago was consistency. So if I go
2 from plant to plant with the current plans, how does
3 one ensure consistency? So my curiosity is, is there
4 a small team that goes around and tries to
5 consistently apply their observations to the plans and
6 procedures you are requesting of them?

7 MR. MORRIS: Let me first start by saying
8 that the inspection program that is being built to
9 provide the oversight piece of our regulatory mission
10 is still very much in the conceptual stages. So don't
11 take anything I'm about to say as being written in
12 stone, because it isn't.

13 Consistency is nice, but at the end of the
14 day it's protection against radiological sabotage that
15 we care about. I'm not asking for everybody to have
16 their system exactly the same way and exactly the same
17 color. What I'm asking for, rather, is that they all
18 can achieve the same end result.

19 Now the practical implications of that are
20 challenging, because if you are not going to get that
21 site-specific detail in licensing space, as Dr.
22 Apostolakis pointed out, you wind up not fairly
23 appreciating the site-specific details until you
24 actually send your guys out into the field and start
25 looking at it. So then the question is, isn't that a

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 large burden on the inspector. And I would say it a
2 little differently. It's a large burden on the
3 licensee, okay, and it's - the inspector is there to
4 try to poke holes in what the licensee has done, and
5 certainly we need to arm our inspectors with
6 sufficient amount of knowledge, scale and ability in
7 inspection techniques to be able to do that job
8 effectively, so that when they walk away, they, A,
9 understand that the licensee did in fact implement the
10 guiding principles of the reg guide and the rule; but
11 also that it actually works. And it's going to be
12 performance based.

13 My vision is, and again it's conceptual,
14 my vision is that the first set of inspections that
15 gets done after the licensing work is done would be
16 largely what I'll call programmatic, which we tended
17 to get away from in every other avenue of regulations,
18 because they don't tell us much. We tend to go to
19 performance based inspections. But they are risk-
20 informed performance based inspections. I think he
21 first out of the docks inspection that we do at every
22 site will be largely programmatic. Did the licensee
23 fully appreciate what the rule said, and have they
24 actually done what they committed to do in their plan?
25 And do we have a sense that it actually is going to

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 work?

2 And we'll do that by what I would envision
3 being sort of vertical slice inspections. Let me pick
4 this system, this system, and this system, and then
5 I'm going to do a full blown, soup to nuts, how do
6 they determine it was a critical system? How did they
7 determine what are critical digital assets within that
8 system? How did they apply the security controls?
9 Where did they populate it? And does all this stuff
10 make sense?

11 So I envision a series of vertical slices.
12 But after that and we have confidence that the
13 program is built and implemented appropriately, that
14 we will move to a performance-based more risk-informed
15 process. Because not all critical digital assets have
16 equal risk significance. Not all things that we look
17 at. So we will wait, as we do in everything else, for
18 small problems to pop up. We will ensure that the
19 licensee does a thorough job of understanding what the
20 root of the problem was, that they have taken
21 corrective action, and then if they have we sort of
22 walk away. And if it happens again, well, then we dig
23 in a little harder. And if it happens again or it
24 looks generic we dig in harder. And that's how I
25 envision this thing going down.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 MEMBER CORRADINI: So let me ask one
2 other follow up. So how are you going to involve the
3 industry so that they understand as you visit the
4 course three volunteers - do the other ones in the
5 industry appreciate how you are going to do it? Are
6 the people from the industry going to join in this to
7 observe and interact on this? Or is it going to be
8 strictly staff and inspectors?

9 MR. MORRIS: Again, I had an opportunity
10 to be part of the formative stages of what is now the
11 reactor oversight process - it's been completely
12 revamped since the 1990s. And I suspect, if I have
13 anything to do with it, it's going to go down in a
14 similar manner. It's going to be a series of
15 workshops. It's going to be bringing in outside
16 stakeholders, get good ideas, bat them around, figure
17 out - and it's going to be collaborative. We will
18 probably run a series of pilots that will be
19 evaluated, and we'll probably have the opportunity to
20 visit with you all again to see how it's going and
21 make adjustments.

22 Only after that will we have a firm --

23 MEMBER APOSTOLAKIS: I'm sorry, Mike.

24 MEMBER RYAN: Scott, I appreciate the
25 description you gave of kind of a process to work

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 through this, but at some point you got to test it.
2 So how about the three gentlemen to your left or
3 other colleagues like them, are there people who are
4 going to actually attack the system and see what they
5 can do? Are they going to test all these protocols
6 and see if we could actually get inside something or
7 not?

8 MR. MORRIS: I don't think we'll get any
9 volunteers to let us do that, but that doesn't mean we
10 couldn't. But what I would say about that is, first
11 of all, that type of thing is done. You've probably
12 heard of penetration testing and other red teaming
13 kind of things that get done. We're in very much of a
14 crawl-walk-run, we're crawling.

15 MEMBER RYAN: Well, the proof's in the
16 pudding at some point There's got to be a malevolent
17 unknown factor, or at least a benevolent unknown
18 factor, to test that. Otherwise how do you know it's
19 working?

20 MEMBER APOSTOLAKIS: At some point in the
21 future, maybe.

22 MEMBER RYAN: Down the line. But that to
23 me is important to think about as part of the planning
24 process of this thing.

25 MR. MORRIS: There are things in security

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 control as these folks will tell you as part of the
2 management and maintenance of the program, to talk
3 about things like effectiveness reviews and
4 vulnerability assessments.

5 MEMBER RYAN: That's inside, looking
6 inside. I'm talking about somebody unknown from the
7 outside.

8 MR. MORRIS: I understand, but it's a
9 similar idea, right, you are challenging the controls
10 in place.

11 MEMBER RAY: But without the people who
12 own the controls knowing it.

13 MR. SHINN: As Scott said, those things
14 are done. I think as Scott said --

15 MEMBER APOSTOLAKIS: Okay, let's move on,
16 Sam.

17 MEMBER ARMIJO: Yes, I have just one
18 question I missed from the presentation. The focus
19 of the presentation seemed to be on external threats
20 coming in electronically. But I didn't see anything
21 about the internal threat, the insider. Which of
22 these strategies deal with that?

23 MR. MORRIS: Let me first say that the
24 insider is very much - first of all the insider is an
25 element of design-basis threat, and if you look at the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 safeguards document, the underpinning of that public
2 language is very specific about the things that we
3 attribute to the insider, specifically with cyber
4 tech. There are a variety of controls in the document
5 that are there to deal with insiders.

6 But even beyond that, there is an
7 overriding program with a series of controls in it
8 that help guard against malevolent insiders. The
9 insider mitigation program is already captured as part
10 of the physical security effort, which includes
11 behavior observation, fitness for duty testing, access
12 authorization, background checks, periodic security
13 controls looking for tampering, and on and on and on
14 and on. So there is an overarching insider mitigation
15 program. But even in addition to that there is a
16 variety of additional controls which these folks can
17 enumerate better than I can.

18 MEMBER ARMIJO: But that would not be a
19 public presentation to discuss that, I suppose?

20 MR. MORRIS: In general terms, we could.

21 MEMBER APOSTOLAKIS: One last comment,
22 during the subcommittee meeting one of our consultants
23 raised the issue of supply chain, and as I recall,
24 Scott, you said, that's why the DBT comes to my mind,
25 you said that it was not - the rule says after the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 DBT. And it's not clear to me how the DBT gets into
2 this business without claiming by the way that you
3 should have done it. Let's not argue about that.

4 So it's not clear to me how you decide
5 that certain things are beyond the call of duty and
6 certain other things aren't. Again, you don't have to
7 answer it now.

8 MR. MORRIS: Well, let me make sure I
9 understand the question. I think what you are
10 suggesting is that what we are offering is that the
11 supply chain attack vector is not specifically
12 enumerated.

13 MEMBER APOSTOLAKIS: That's correct.

14 MR. MORRIS: And yet there are a series
15 of controls in here that deal precisely with that
16 problem. That's an interesting point, frankly, I
17 hadn't considered before.

18 MEMBER APOSTOLAKIS: Frankly, I'm sure a
19 lot of these controls deal with a lot of things,
20 because they are simply - because they're depth based.

21 But I thought your answer was interesting, that this
22 goes beyond what you are expected to do, and I really
23 don't understand why. I mean the DBT really doesn't
24 say anything about these things.

25 Now another thing I think you said was

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 that this is now going beyond the responsibility of
2 any individual activity, that it is sort of a national
3 problem. And again that is not clear to me either.

4 But anyway I don't want to start a whole
5 discussion on this. But is - are there any other
6 questions from the members?

7 Okay, well, thank you very much, and I
8 guess we will talk about it this afternoon, sometime.

9 CHAIR BONACA: Thank you for your
10 presentation. And it looks like lunch, we'll get back
11 up here at 1:15.

12 (Whereupon, the above-entitled matter went
13 off the record at 12:19 p.m. and resumed at 1:15 p.m.)

14 CHAIR BONACA: Okay, let's get back into
15 session.

16 The next item on the agenda is the
17 overview of the Advanced Boiling Water Reactor Design
18 as Applied to the South Texas Project Combined License
19 Application, and Dr. Abdel-Khalik will begin the
20 presentation.

21 OVERVIEW OF THE ADVANCED BOILING WATER REACTOR
22 (ABWR) DESIGN AS APPLIED TO THE SOUTH TEXAS PROJECT
23 (STP) COMBINED LICENSE APPLICATION (COLA)

24 VICE CHAIR ABDEL-KHALIK: The ACRS was
25 briefed about the ABWR in December of 2007 after South

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 Texas Project Nuclear Operating Company had submitted
2 the first license application in September of that
3 year for two ABWR units at the current STP site.

4 Since then STP has made some changes in
5 their plans for building their ABWR units including
6 the replacement of the engineering, procurement and
7 construction vendor. The NRC staff review has now
8 come to a point where they want to bring the draft
9 safety evaluation report in parts to ACRS for review
10 starting early next year.

11 We have tentatively scheduled several ABWR
12 subcommittee meetings in March and May of 2010.

13 However, before the ACRS begins reviewing
14 the draft SER we thought that an information briefing
15 regarding the major aspects of the ABWR design as it
16 is being implemented by STP will be helpful to the
17 committee.

18 We also wanted to learn about the
19 anticipated DCD amendment, a major departure STP is
20 taking from the ABWR design which was certified in
21 1997.

22 So two back-to-back presentations are
23 scheduled for this afternoon. The first deals with
24 the ABWR design overview and the DCD amendment, while
25 the second deals with significant departures as well

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 as other areas of interest including staff
2 qualification of the alternate vendor.

3 The first half of the briefing was listed
4 in the Federal Register as open slash closed. Part of
5 that briefing may need to be closed to the public
6 since it includes a discussion of the DCD amendment
7 for the implementation of the aircraft-impact rule, in
8 which security-related information may be discussed.

9 I'm asking the staff to let us know when
10 the meeting needs to be closed before we enter into
11 such discussions, and to verify that only people with
12 the required clearance and need to know are present.

13 Please note that information above the
14 level of security-related may not be discussed in this
15 arrangement.

16 As a reminder we request that participants
17 in this meeting use the microphones located through
18 this meeting in addressing the committee.
19 Participants should first identify themselves and
20 speak with sufficient clarity and volume so that they
21 can be readily heard.

22 We will now proceed with the meeting, and
23 I call on Mr. Mark McBurnett of STP to begin the
24 presentation. Mark.

25 MR. MCBURNETT: It's a pleasure to have

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 the opportunity here today to discuss the ABWR and our
2 plans for moving forward, and the status of the
3 departures, and so forth. It's indeed a good thing.

4 I'll start off with just reviewing slide
5 #3. I'll go through some introductions in a minute.
6 Let's start on slide #4. Just overall, the purpose
7 that we are here today as we said is to provide an
8 opportunity to overview for the ACRS on the background
9 of the application of the U.S. certified ABWR in South
10 Texas by Toshiba. And the agenda on page five as it's
11 laid out goes through the same material you just spoke
12 to. I'm going to go through the introduction, and
13 turn it over to Sakamotosan to my right will do a bit
14 briefing on Toshiba and Toshiba's background and
15 qualifications as well as some of the comparisons of
16 the ABWR to the more traditional boiling water
17 reactors that are in operation currently and
18 understand what makes an advanced boiling water
19 reactor.

20 Then we will have a plan breakout and do
21 the aircraft impact discussion regarding the closed
22 portion of the meeting. And it was put in the middle
23 of the session like that based on your direction to
24 us.

25 Then we'll switch, and I'll start talking

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 about STP specific, how we got to choosing the ABWR
2 and some site information, details on the departures,
3 significant departures.

4 And a couple of items at the end, we'll
5 discuss fuel design, and licensing strategy.

6 I wanted to introduce my - we've got a
7 number of our folks in the back of the room, so I've
8 got quite a bit of backup for answering questions, so
9 I'll call on them if they're needed. But at the front
10 table, we have assembled a strong team for the
11 building of the ABWR in South Texas. We've selected
12 Toshiba as the contractor, the engineering procurement
13 construction contractor for the contract. Toshiba
14 comes with a very strong background in building
15 reactors in Japan, a long history there, including
16 designing and building advanced boiling water
17 reactors.

18 To my right is Sakamotosan. He is the
19 vice president of Toshiba America Nuclear Energy,
20 responsible for business development and strategic
21 planning. He'll go through the details of Toshiba's
22 background, and the comparison of the ABWR to the BWR.

23 To his right Bob Hooks is with Sargent &
24 Lundy. We've selected Sargent & Lundy as the reactor
25 building designer. Sargent & Lundy is responsible, a

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 full scope architect engineer, very experienced in
2 building reactors in the U.S., has the responsibility
3 for the reactor island design, and basically taking
4 the design that is in Japan and putting it,
5 Americanizing it, bringing it into American codes and
6 standards and analysis, and putting it in a design
7 that can then be implemented in the field.

8 On my left Bob Schrauder is the vice
9 president of licensing for TANE. TANE is Toshiba
10 America Nuclear Energy. That is the American entity
11 of Toshiba.

12 And there's Bob Quinn from Westinghouse.
13 Toshiba has Westinghouse under contract for providing
14 safety analysis and fuel design, and aircraft impact
15 analysis, a few other things, drawing on the depth and
16 breadth of Westinghouse. Westinghouse supplies BWR
17 fuel, so it had the analysis capability for BWR fuel.

18 We'll talk about that at the end. They are the
19 supplier for the safety analysis portion of the plant.

20 And I didn't bring to the table with us,
21 but Fluor is selected as the constructor and designer
22 of the turbine island and the balance of the plant. I
23 didn't know we'd have any particular for them, so I
24 didn't bring them to the table.

25 So that's again how we are set up. And

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 again I have some gentlemen and ladies in the back of
2 the room to answer any other questions that may come
3 up that are beyond me.

4 MEMBER ARMIJO: What is the scope of MPR?

5 MR. McBURNETT: Oh, I should have
6 mentioned, thank you for asking. MPR is assisting
7 TANE, Toshiba America Nuclear Energy, in really
8 transitioning into the U.S. and providing U.S.-based
9 expertise in project management, in engineering and
10 technical areas. We are just helping them make that
11 transition into the U.S. market, U.S. organization.

12 MEMBER CORRADINI: In terms of standards?
13 I'm trying to understand.

14 MR. McBURNETT: Well, in terms of, just
15 in terms of Japanese coming into the U.S. market and
16 understanding how processes work and organizations,
17 and how to understand the details of regulations and
18 how you do things, is primarily I think a fair
19 characterization. You may, Sakamotosan, be able to
20 give more clarity to that. In fact, I'll turn it over
21 to Sakamotosan now, and let him go from there.

22 MR. SAKAMOTO: Thank you, Mark.

23 My name Hiroshi Sakamoto. I am from
24 Toshiba Corporation. I work for the Toshiba Nuclear
25 Power Division for 28 years background in nuclear

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 engineering, and now I'm a senior vice president of
2 Toshiba American Nuclear Energy, and also a position
3 in Japan too.

4 So here I'm here to explain about the
5 overview of Toshiba's experience and roles, and also
6 the overview of the ABWR that Toshiba provides for the
7 STP.

8 I just wanted to touch upon very simply
9 about our experience. Toshiba started nuclear
10 construction or nuclear engineering back in the early
11 1960s. They started the construction in Japan mostly
12 the BWRs since 1966 continuously up to now. We have
13 constructed 22 plants, BWRs, ABWRs, 17 as a prime
14 contractor, 5 as a sub. When we say sub, this is
15 sometimes providing the turbines, or sometimes
16 providing sort of a supportive - not supportive,
17 generally it was very early stages, when GE brought in
18 the first BWR we were sort of subcontractor, but
19 actually that was only for the very first couple of
20 weeks.

21 And then Toshiba currently has about 32
22 percent in the megawatt-space of Japanese BWR and also
23 was the active acquisition of the Westinghouse in
24 2006. We also cover the Westinghouse part, which is
25 small, but 7 percent in Japan. So we are the largest

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 nuclear supplier in Japan up to now.

2 We have --

3 MEMBER CORRADINI: Just one point, I
4 think I know, but just in case. You have this plot of
5 your various projects. Is it Kashiwazaki 6 and 7 that
6 are the ABWRs?

7 MR. SAKAMOTO: That's right.

8 MEMBER CORRADINI: Are those the two? Or
9 are there more than that?

10 MR. SAKAMOTO: Kashiwazaki 6 and 7 are
11 the first two ABWRs, and Hamaoka 5 and also Shika 2 -
12 this only shows the Toshiba construction stuff. So it
13 does not include the --

14 MEMBER CORRADINI: Six and seven are
15 ABWRs?

16 MR. SAKAMOTO: Yes, and also Hamaoka 5.

17 MEMBER CORRADINI: Okay, thank you so
18 much.

19 MR. SAKAMOTO: And Toshiba's role that
20 they played in the Japanese construction is, first we
21 design, engineer and supply the equipment. Our
22 equipment is mostly the nuclear reactor in general,
23 essentially key components like major internal pumps
24 or CRDs, and electrical systems, control systems. But
25 one major difference compared to the supplier is, we

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 also do the construction management.

2 In the case of the construction, during
3 the construction we have our preferred engineers
4 dispatched to the site and do the construction
5 management of the plant throughout the entire
6 duration.

7 About 20 to 30 proper Toshiba engineers
8 stay constantly at the site before the start up
9 testing. After the start up testing there will be 100
10 or more people. And also that is only Toshiba's
11 direct proper people. We also cover many of the
12 indirect technical advisers and things like that.

13 So I think generally speaking, during the
14 construction period and outage, I'd say about one-
15 third, 30 percent, 20 to 30 percent, of people
16 Toshiba's group supplies in the construction. So that
17 is how we manage the construction throughout the
18 period, and also get the feedback of the construction
19 to the further, next generation of construction.

20 MEMBER ARMIJO: Let me ask a question.
21 You have the Lungmen manufacturers in your chart. I
22 understand that is GE-supplied. What is the Toshiba
23 scope?

24 MR. SAKAMOTO: Yes, in Lungmen, we only
25 supply the equipment, in that case, my explanation

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 about the construction, taking part in the
2 construction, does not apply to them.

3 MEMBER ARMIJO: So Lungmen is just
4 equipment, supplies?

5 MR. SAKAMOTO: Yes, reactor pressure
6 vessel and reactor in general, reactor internal pumps
7 and FMCRD. Those are the limited scope that we have.
8 Actually we supply it to GE, and GE supplies to the
9 turbine power.

10 MEMBER ARMIJO: We understand.

11 MR. SAKAMOTO: On the next page talking
12 about the ABWR itself, again the Kashiwazaki 6 and 7
13 that was the first ABWR or the first ABWR design and
14 constructed. Kashiwazaki 6 turned commercial
15 operation in 1996. Actually it was the first, but at
16 the same time for the construction, we maintained the
17 shortest construction period of 37 months from the
18 first complete boring to the fuel loading. And that
19 was Kashiwazaki 6. Kashiwazaki 7 also followed one
20 year, like one year later. And for Toshiba Hamaoka 5
21 was another, the next generation evolved version.
22 This turned to commercial operation in 2005.

23 And Shika 2 was Hitachi's construction and
24 also Lungmen 1 and 2, this is the GE's ongoing
25 project.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 And also from the Kashiwazaki 6 and 7, I
2 will come back again, this is the basis of the U.S.
3 ABWR DCD design. And this was done in parallel. And
4 then from the U.S. ABWR DCD is the current STP three-
5 four project actually is design based on the DCD, the
6 departures from which we will mark, and other key
7 member will explain.

8 Next page I would like to just briefly
9 explain the history or the background of the ABWRs and
10 our involvement. The ABWR actually is in reality a
11 BWR with advanced equipment and systems. So it is a
12 part of the BWR family, and its conceptual designs or
13 at least these ideas have been discussed for a long
14 time, at least since the '70s to the '80s. But in
15 reality the real engineering work started in 1980,
16 very early 1980, I think it was 1981, under the
17 contract of TEPCO, the Japanese utility. And five
18 other Japanese utilities being suppliers, the client,
19 and Toshiba, Hitachi and GE forming a consortium to
20 develop the ABWR, the test of the actual design of the
21 ABWR specific equipment, and the engineering.

22 The basic contract, it does actually
23 specify the IP rights and all things to the utility,
24 the client. But after the five years after this study
25 finishes, which I thought it was back in 1987, the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 consortium members have equal rights to all the
2 studies which have been done on the ABWR, so we all
3 have the equal rights all over the world under ABWR.

4 And actually going back in the history,
5 after this joint construction study or the work,
6 Toshiba and Hitachi concentrated on the development
7 and the actual construction of K-6 and K-7. The thing
8 is that all the design documents had to be prepared,
9 and manufacturing done, and basically this is the
10 construction in Japan with Japanese customers, so it
11 is written in Japanese, and the Japanese unit. So
12 this is what we had been doing.

13 And in parallel, GE focused on with the
14 same design focused on bringing it to the U.S., and
15 preparing for the design certification.

16 So the major part of the K-6 and 7 really
17 shares the common engineering of the ABWR.

18 And in Japan, after the K6 and 7 for us
19 the Hamaoka 5 was really the next project, so we
20 entered immediately into it, and interestingly,
21 Toshiba also started to work more diligently with U.S.
22 companies in the U.S. market back in 2001. Actually
23 that was when I was first assigned to the U.S. We
24 have entered into this NP 2010 DOE study with the TVA
25 on the Bellefonte ABWR. That was also based on the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 Japanese design, but for Americanization. This was
2 really back in 2004 and '5, and so they are going
3 through the process of transferring two things. One
4 was to revisit the evolved version of the Japanese
5 ABWR design and compare with the DCD, that was first
6 done. There were significant departures, so we have
7 looked into and eliminated unnecessary divergence to
8 come back to the DCD to identify. And of course all
9 the cause and standard and those differences we have
10 clearly identified.

11 Actually going back to the question about
12 the MPRs, and their involvement, MPR has been involved
13 and is Toshiba, before this STP project, since during
14 this TVA study, and actually identifying all the
15 differences between U.S. and Japan. And this is the
16 current ABWR status, and also the DCD.

17 MEMBER CORRADINI: Again, just for
18 clarification. So the way you have it graphically, it
19 seems that the U.S. ABWR has emerged out of
20 Kashiwazaki, and in parallel with Hamaoka. Are
21 Hamaoka and what will be the design for South Texas
22 identical at least within some degree, or is there
23 some evolutionary difference between them?

24 MR. SAKAMOTO: In that sense Kashiwazaki
25 will be more basis. Kashiwazaki is also the basis of

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 the DCD. Hamaoka has a very special - it is
2 constructed in a very seismic - specially in
3 seismically severe condition, so it is a very special
4 plan.

5 MEMBER CORRADINI: Okay.

6 MR. SAKAMOTO: So Hamaoka did adapt some
7 of the new technologies that we are also adapting for
8 the new ones. But the basis is Kashiwazaki.

9 MEMBER CORRADINI: Okay, thank you.

10 MR. SAKAMOTO: Through this process we
11 have come to talk with the STP for the realization of
12 the U.S. ABWR discussion. And these are the
13 backgrounds where we came from on the STP three four
14 project.

15 On the next slide, as a summary ABWR was
16 developed in Japan under the cooperation of Toshiba,
17 Hitachi and GE, and supported by TEPCO and other
18 Japanese BWR utilities. Toshiba has a complete set of
19 ABWR design documents through the development of it,
20 and the actual construction experiences in Japan.

21 So that is sort of a very short
22 introduction of Toshiba's background in ABWR.

23 Next I wanted to touch upon the ABWR to
24 BWR comparisons, and touch upon the major functions or
25 features of the ABWR. Here I will touch on the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 technical part, and if there is any further questions
2 I will ask my special assistants to answer. But I
3 will go ahead with the overview.

4 ABWR again, as you can see here, basically
5 is a BWR, and with some specific features on the
6 equipment. What all the features run is the reactor
7 internal pumps, which is sort of the replacement of
8 the recirculation pump. And that is the RPV, fine
9 motion control drive. This is saying that the control
10 rev drive itself is the same, but it has more refined
11 motion which helps the reliability and the control,
12 but has the same safety functions as before.

13 ECCS with the use of the PSA, we have, you
14 know, have more sophisticated ECCS system three
15 separations, and enhancement of the ECCS. I'll come
16 back to that again.

17 And one, from the reactor pressure
18 perspective, reactor pressure vessel and core really,
19 itself, it has become bigger and more efficient. But
20 it is still the same BWR core.

21 And the RCCV, instead of the steel
22 containment vessel, we now have this concrete,
23 reinforced concrete containment vessel with the steel
24 liner, so it's about six feet of the concrete,
25 reinforced concrete, of the major structure to

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 withhold the pressure, and also internally it is lined
2 by the liner with the steel to enclose the gas and the
3 materials inside.

4 And due to the elimination of the recirc
5 pipelines and stuff like that, the reactor building
6 itself has become a bit smaller and more compact,
7 about 77 percent compared to the traditional PWR 5
8 type of reactors, and still the dosage, the radiation
9 exposure, those things are significantly reduced.

10 It also has the advanced main control room
11 design, the ABWR is fully digitalized, and the control
12 room also, digital control systems are adopted, and
13 also the man-machine features.

14 Turbine generators, it's basically the
15 same except we adopted the larger more efficient
16 turbines. So the basic structure of the reactor and
17 turbine this is the same as the BWR as usual.

18 I will go into no detail about the main
19 features of the comparisons. First of all this shows
20 several - before going into this I want to mention
21 that the reactor itself and the thermal hydraulics and
22 neutronics, neutron physics, and those behaviors, is
23 exactly the same as the conventional BWRs. Of course
24 the size is different, so some of the detail minor is
25 different. But it still is operated under the flow

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 control, the control - the power is controlled based
2 on the controlling of the recirculation flow, and also
3 the control rod.

4 And regarding the recirculation flow, the
5 conventional BWRs had two external recirculation large
6 28 - 30 inch pipe going out in the pond, and circled
7 back with the jet pumps. And well generally speaking
8 the control was done by the MG set or the variable
9 recirc pumps or the flow control valves.

10 The ABWR uses 10 internal recirc pumps.
11 It's directly attached to the reactor vessel, and the
12 shaft inserted - the inflow will actually directly
13 force the water to recirculate in the reactor pressure
14 vessel.

15 It is controlled by the inverter, so it
16 has a variable frequency drive control.

17 MEMBER RAY: Are the motors subjected to
18 the reactor pressure, or are they cam-levered?

19 MR. SAKAMOTO: This is -- what -- yes.

20 MEMBER CORRADINI: Just so I -- from the
21 standpoint of the evolutions of these 10 internal
22 RIPS, the RIPS --

23 MR. SAKAMOTO: The RIPS, yes.

24 MEMBER CORRADINI: Are the same as
25 Kashiwazaki?

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. SAKAMOTO: Yes, Kashiwazaki.

2 MEMBER CORRADINI: All right, thanks.

3 MR. SAKAMOTO: The ABWRs, one of the
4 major features is this RIPS. So Kashiwazaki, Hamaoka,
5 yes, all have this one. And due to this the entire
6 recirc loop, the pipes and loops, are completely
7 eliminated. So one of the major features which I
8 will come back to again but below the top of the
9 active field there is only about two inch pipes - you
10 know sort of - there is no longer any big diameter
11 pipes under the active field levels.

12 So this has a significant advantage on the
13 safety side, and also the loop - also the recirc loop
14 was one of the major sources of exposure to the
15 radiation for the workers, and they have significantly
16 reduced the dosage of the operation - operators.

17 Another function is the control rod guide.
18 In the conventional BWR it is a completely
19 hydraulically operated control rods with single rod
20 operations working the notches and always the water
21 pressure. The ABWR uses fine motion control rod
22 drives, which is sort of two functions. The strong
23 function is the same as the conventional BWR. It has
24 accumulators, and scrams with the high pressure water.
25 So on the safety side it is the same as the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 conventional.

2 But for the normal operations it uses an
3 electrical motor which rotates and sort of screws in
4 the rod so that - screws in the shaft, I would say,
5 the rod would just go up in fine motion which gives
6 very good functions in controlling the power in a very
7 detailed fashion.

8 Also since all the control rods has its
9 own independent motors, we also adopted the group our
10 GAN control capability, which is under the
11 circumstance insert different multiple rods at the
12 same time.

13 And those are the two major functions to
14 control the power of the reactor. And going into more
15 of the safety design, the LOCA design, the major
16 difference as I mentioned, due to the elimination of
17 the recirc piping, under the transients, or the
18 transient -- the reactor pressure vessel water level
19 post-blowdown will maintain above the top of the
20 active fuel level, and which is different from the
21 BWR, and those cases with the large break LOCA, we
22 have to consider above two-thirds of the core height
23 is the LOCA level, the spray cooling.

24 So this has contributed significantly
25 again to the enhancement of the safety. And the next

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 page, yes, the ECCS case, the conventional BWRs have
2 one division of the high pressure ECCS, and also two
3 division of coarse spray and low pressure flooding.
4 ABWRs have three independent divisions which each have
5 one high pressure and one low pressure, so it has
6 three independent ECCS systems which each of them has
7 the capacity to cool down the system emergency.

8 And also one other feature is the ATWS
9 mitigation, and the stated transients without scram.
10 For this mitigation features, there are a couple of
11 designs which are adopted.

12 One thing before touching upon the ATWS
13 mitigation itself is not required as - defined as a
14 regulation in Japanese regulations. But ATWS it was
15 designed, was the common engineering, from the
16 beginning it was the U.S. regulations in mind; it
17 fully complies with the ATWS requirements of the U.S.
18 and has the capabilities to mitigate these. One is
19 the alternate rod insertion, I mentioned about the rod
20 mechanism insertion is the scram, and also the fine
21 motion motor drive. It also has the capability of
22 pushing up the rod and the water pressure level also.

23 And so in case of the failure this has
24 another alternative rod insertion. Recirc pump trip
25 was stopping the recirculation flows would reduce the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 power. And also standby with good control system
2 initiations, the boron injection, and fine motion
3 control rod drive autorun, this is another alternative
4 where actually we don't use the - the scram actually
5 the water pressure, but at the same time if it is not
6 inserted old motors would react and insert the rod
7 with the electrical power also.

8 And also the feedwater pump run back which
9 will remain, restrict the water level, and lower in
10 the vessel, and actually restricts the natural
11 recirculation.

12 These are the ATWS mitigation features.

13 VICE CHAIR ABDEL-KHALIK: How about
14 stability considerations comparison between ABWR and
15 BWR?

16 MR. SAKAMOTO: I think the stability
17 consideration, of course ABWR also has the BWR, so
18 it's the area of the instability, or the stability.
19 But I think it was the larger core, the design has
20 much more stable - if I could ask Nirmal Jain.

21 MR. JAIN: My name is Nirmal Jain from
22 Westinghouse. The stability analysis is ongoing. But
23 basically it is similar. And at this point it depends
24 on the design of the core. But at this point it's
25 more likely to be more stable. But it's not

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 fundamentally any different than BWR. It's the same,
2 the protective system, OPRM, that's what the stability
3 in ABWR is about. VICE CHAIR ABDEL-

4 KHALIK: Do any of the Japanese plants have an OPRM
5 detect and suppress system at all?

6 MR. SAKAMOTO: Japan does not adapt OPRM
7 .

8 VICE CHAIR ABDEL-KHALIK: But this is
9 going to be adopted here?

10 MR. SAKAMOTO: Yes.

11 MR. JAIN: It is being adopted here. We
12 are developing the topical reports to confirm that.

13 MR. SAKAMOTO: So actually there are some
14 differences between how it's implemented in Japan and
15 here, so there needs to be the so-called
16 Americanization or the design changes that we have
17 gone through since 2002 before the DOE study.

18 Next I want to touch upon again also about
19 the ABWR, the severe accident mitigation features.
20 Many of - some of the components, I know the
21 functions, the features - are the same as the BWR.
22 But first it has the inerted containment, and it has
23 the lower drywell flooding capability, lower drywell
24 special concrete and sump protections, suppression
25 code, fission products scrubbing and retention

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 function; containment; overpressure protection
2 function; drywell sumps; corium shield; and AC
3 independent water additions.

4 The major configurations of the APWR are
5 within the RCCD is shown on the right figure.

6 MEMBER CORRADINI: So if I might answer
7 the question since I unfortunately only remember a
8 newer version of a BWR. So there is no isolation
9 condenser, and there is no containment, passive
10 containment cooling feature; is that correct?

11 MR. SAKAMOTO: Yes. If there are any
12 further question I can call on my specialists on that.

13 MR. JAIN: That is correct. It is not an
14 isolation condenser.

15 MEMBER CORRADINI: Okay, and then my
16 other question is, for the features that you
17 identified qualitatively here, if memory serves me
18 these are similar to what are in the current approved
19 DCD.

20 MR. JAIN: That is correct, sir.

21 MEMBER CORRADINI: There is nothing
22 different in this regard that I recognize.

23 MR. MCBURNETT: No, nothing in here is
24 different from the current certified --

25 MEMBER CORRADINI: Okay, thank you.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. SAKAMOTO: Okay, next. As a result
2 from the calculations of core damage frequency of the
3 ABWR the STP three-four case, is maintained as two
4 times 10 minus seven, which is significantly lower
5 than the conventional ones.

6 Next page, this is the last one. But also
7 I have not gone in detail about the advanced control
8 room. But in May there is another ACRS review of the
9 design for this control RNC and control room, so I
10 will leave that more in that part.

11 But this is a picture of the Hamaoka 5
12 control room. As I mentioned the Hamaoka 5 has a
13 different configuration, actually because it's more of
14 the seismic, the reactor buildings are different, but
15 the control rooms are exactly the same. And this is
16 going to be very much likely that STP three-four
17 control rooms. And it has a very user friendly
18 control room, which in the background has a large
19 mimics of the displays and simplified annunciators and
20 those things, and on front it has the operation
21 consoles. And also it's a fully digital control
22 system. However the design comes with digital common
23 mode failure by incorporate of diverse hardwired
24 features, which means that some of the front panels
25 and the operation nodes have the conventional hard-

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 wired operations for the essential systems for shut
2 down of operations. So in case there is a common mode
3 failure in the digital you can still shut down in
4 conventional hard-wired mode the plant.

5 We are also planning to bring some of the
6 simplified annunciator into our facility in the U.S.
7 and start testing here, and I think by the time you
8 have this next ACRS meeting we can also review the
9 electronic testing here, and be able to invite you to
10 that system to see the actual operation of that too.

11 That sort of concludes my brief summary of
12 the overview of the ABWR. VICE CHAIR ABDEL-

13 KHALIK: When does STP plan to begin hiring and
14 training operators?

15 MR. MCBURNETT: I didn't bring that
16 schedule with me. We have it all laid out in a pretty
17 detailed plan, our ramp up for staffing operators. We
18 currently have, we're staffing with training
19 instructors, developing training lesson plans and
20 procedures. And having that in place and hiring
21 operators, and I'll have to get back to you on a --

22 MEMBER BLEY: You said that you actually
23 already have the training staff?

24 MR. MCBURNETT: Yes, we have four or five
25 training instructors we've hired. We have sent them

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 to the training center at Kashiwazaki, where they have
2 been through simulator training. And we basically
3 have also taken the procedures from Kashiwazaki 6 and
4 7, we are using that as a starting place. They are
5 not quite what we need as far as our impost certified
6 systematic approach, but we are taking as a great
7 starting place for us to move to where we need it to
8 be.

9 MEMBER BLEY: Do you have plans to have a
10 simulator in place?

11 MR. MCBURNETT: We've got the -
12 simulators are one of those - there are three critical
13 paths for this project, and the simulator is one of
14 them. So we've got a simulator scheduled coming in
15 just in time to qualify operators and train them. So
16 we'd like to have it sooner, but it's really between -
17 the simulator depends on the design of this control
18 room and the systems. The simulator will be in place
19 the same time we're developing the training
20 instructions and training instructors and processes of
21 training operators. And the other critical path is
22 overall engineering design and licensing were the
23 three big critical paths.

24 But I told you, I can't give you a date
25 off the top of my head.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. CHAPPELL: My name is Coley Chappell
2 of STP licensing. Current schedule, 2012 and 2013 are
3 the rough dates, and that is to support licensed
4 operator training so that we would have complete crews
5 in time prior to fuel.

6 MR. MCBURNETT: Crews in 2012 or
7 starting?

8 CHAIR BONACA: That's when we start the
9 classes.

10 MR. MCBURNETT: Start the classes.

11 MEMBER ARMIJO: Could you tell us a
12 little bit about the fuel and fuel experience with
13 ABWRs? If it's going to be a different fuel suppliers
14 than the initial ones, and the ones in Japan, and the
15 ones in Taiwan, so if you could just summarize that
16 for us.

17 MR. SAKAMOTO: Maybe you can help? Well,
18 first of all for the Japanese ABWRs we have we are
19 supplying it through the GNF, and you know the fuel,
20 and we are now also designing the fuel based with the
21 Westinghouse analysis.

22 MEMBER CORRADINI: But let me just repeat
23 what you just said so I understand it. So for the
24 current operating plants in Japan, Global Nuclear
25 Fuels is essentially the fuel supplier currently?

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. SAKAMOTO: In Japan, yes.

2 MR. MCBURNETT: And we're planning our
3 supplier will be Westinghouse.

4 MR. JAIN: And maybe I could add a few
5 words about the Westinghouse background in BWR. We
6 have been supplying fuel to right now to four reactors
7 in the U.S., and previously we had supplied fuel to
8 two other sites. It's the same fuel design which is
9 considered for STPs, and there is a fair amount of
10 experience in this country as well.

11 MEMBER ARMIJO: Has any of that fuel been
12 used in ABWRs either in Japan or elsewhere?

13 MR. JAIN: No.

14 MEMBER ARMIJO: So you haven't taken some
15 of that Westinghouse fuel and put it into your ABWRs
16 in Japan to get some experience or anything like that?

17 MR. SAKAMOTO: Not yet.

18 MR. JAIN: Not yet, but there is some of
19 the Swedish reactors have very similar designed
20 reactor internal pumps. Either they are not ABWR,
21 they are designed from that perspective, it's very
22 similar, and there the same fuel is being used. So
23 there is some experience in ABWRs.

24 MR. MCBURNETT: Any other questions.

25 The next segment was to talk about

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 aircraft impact assessment.

2 VICE CHAIR ABDEL-KHALIK: All right, at
3 this time I'd like to call on the staff to verify that
4 only people with the required clearance and need to
5 know are present.

6 MR. MCBURNETT: I'm going to ask my staff
7 that are not directly involved in aircraft to step out
8 also.

9 (Whereupon at 2:00 p.m. the open
10 proceeding adjourned, to resume in closed proceedings
11 at 2:02 p.m.)
12
13
14
15
16
17
18
19
20
21
22
23
24
25

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

O-P-E-N S-E-S-S-I-O-N

(2:45 p.m.)

VICE CHAIR ABDEL-KHALIK: Okay, so the meeting is now reopened, and we will go to the open session that deals with the departures from the certified design overview.

And at this time I guess we can let people come back in.

(General audience returns to the hearing room.)

We are back in open session, and I guess we will go back to the original handout, and that's page 20 of the original handout.

OVERVIEW OF THE ADVANCED BOILING WATER REACTOR (ABWR) DESIGN AS APPLIED TO THE SOUTH TEXAS PROJECT (STP) COMBINED LICENSE APPLICATION (COLA)

MR. MCBURNETT: Okay, #21 please. We'll talk a little bit about the background on South Texas and the plant, and then I'll move into discussion of the departures.

Just a general familiarization with south Texas, the STP site is 90 miles south of Houston. It's on the Texas Gulf Coast. It's located, the actual reactor plants are about 13 miles inland from

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 the Gulf of Mexico.

2 We are a very large site, 12,200 acres,
3 has a 7,000 acre reservoir, actually it's sized for
4 four units. We currently have two units on it, two
5 large Westinghouse specialized water reactors. It was
6 - it's an off channel above grade man-made structure.

7 It serves both the purpose of storing water - we pump
8 water out of the Colorado River when the river has
9 water flowing in it, store the water, use it for
10 cooling, and then make that from the river.

11 The - we have infrastructure in place for
12 building the units. We have roads and rail access,
13 barge access. The Colorado River is a navigable
14 waterway. In fact in the last some years back we
15 brought in new steam generators for units #1 and #2 on
16 barges on the river, so we have the access and the
17 capability to get the heavy equipment in, and so
18 forth.

19 We have the transmission corridors. South
20 Texas is located with one of the major hubs within the
21 distribution system in Texas. And we have - there are
22 eight 345 kV transmission lines going out. We don't
23 need any additional corridors, we don't need any
24 additional lines. We will reconduct a couple of those
25 lines to larger sized conductors.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 It's a low population density. We are
2 located in a single county. In fact the whole
3 population of the country is only 39,000, but the
4 actual 10-mile emergency planning zone has under 3,00
5 people in it.

6 If you look at the picture you see South
7 Texas, one of the predominant features, and what
8 people notice when they come to South Texas, is that
9 it's flat. There just is not - there is no real
10 elevation changes in the area.

11 We have existing state, county, emergency
12 plans. Strong community support in Texas. There is a
13 small population in the county. We are the largest
14 entity in that county, the major tax payer, and a good
15 corporate citizen and neighbor and well appreciated.
16 So it's a really good place. So we've got the
17 cooling, we've got the reservoir, we've got the water
18 rights to be able to provide the new unit. So that is
19 the strong advantages of it.

20 MEMBER STETKAR: Let me interrupt. In
21 that photograph it looks like there are two plumes.
22 What is that?

23 MR. MCBURNETT: Yes, when this photograph
24 was taken they were burning fields. And the Texas
25 Gulf Coast back in many many years ago, where it was -

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 before we came in, it was basically a prairie. It was
2 all grass. The grass was maintained by burning, by
3 grass fires.

4 MEMBER CORRADINI: That's a common thing
5 in the Southwest.

6 MR. MCBURNETT: Common thing. So what
7 you see, particularly in the wildlife refuges around
8 the area, they will periodically burn it to maintain
9 the ecosystem, and I suspect that was what was going
10 on that day when the photograph was taken. That is
11 actually be hind the golf range.

12 (Comments off the record.)

13 MR. MCBURNETT: By the way you are
14 looking from north to south. The southernmost
15 boundary of the property is basically the edge of the
16 main cooling reservoir. So in the background, the
17 back of the main cooling reservoir is the back
18 boundary of the property.

19 So that fire is probably 10 miles away
20 from the reactor. But that is not uncommon to see
21 that in our area.

22 I would mention the technology selection,
23 what led us to the Advanced Boiling Water Reactor.
24 Two primary things: one is the design was certified by
25 NRC; and the other is, there are four units in

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 operation in Japan, proven construction record and a
2 proven operating record. What that did for us was
3 lowers licensing risk, lowers construction risk, it
4 gives us really what we thought we could implement as
5 soon as possible. And that was the mission from our
6 owners, what can we put in the field with the least
7 risk as soon as on our schedule as soon as possible.
8 That led us to the ABWR.

9 MEMBER STETKAR: Let me interrupt. You
10 mentioned that the only amendment to the DCD is
11 related to the --

12 MR. MCBURNETT: Yes, sir.

13 MEMBER STETKAR: I have no historical
14 experience myself with the original design
15 certification. I assume that because of its history
16 it came with design acceptance criteria for digital
17 instrumentation control systems. Will those be
18 resolved as part of your COL application? Are you
19 going to talk about that in your next session?

20 MR. MCBURNETT: We can - Mike, why don't
21 you -

22 (Simultaneous speakers.)

23 MR. MCBURNETT: That was the overall idea
24 going in was to minimize departures. We knew the more
25 departures we put into it, we increase the licensing

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 risk over the life and duration, the amount of review
2 that the staff had to do. So our goal was, while not
3 doing anything dumb, by trying that strategy, but be
4 very smart and very selected about what we picked as
5 departures. And we will go through the list. But
6 that was the strategy going into it was not to grab
7 everything we could, but to real strategically pick
8 the right departures and put those into play.

9 And before I get to departures I will do a
10 couple of things. I also wanted to mention, while we
11 have selected Toshiba as the supplier, we have a
12 contract with Toshiba American Nuclear Energy as the
13 engineering construction contractor to basically
14 deliver this plant.

15 In selecting Toshiba, we are selecting a
16 vendor that wasn't the original provider of the
17 certified designs. We had to satisfy ourselves that
18 Toshiba did have the capability to deliver the
19 certified design in the U.S. We started off in that
20 process asking Toshiba and actually MPR and Toshiba to
21 perform a capabilities assessment. Caroline
22 Schlaseman was the lead on that effort, but we had
23 something like 40,000 man hours of activity going to
24 the task of Caroline assembled industry experts and
25 folks form Toshiba to go through their design and

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 their information, and identify any gaps. We were
2 really looking for anything they didn't have that
3 would create an insurmountable problem for us in being
4 able to implement that design in the U.S.

5 They implemented that work, and we came
6 after it with due diligence effort, we came in with
7 our own staff plus some outside industry experts that
8 we brought in to help us and do the due diligence
9 oversight of that process, and go through it and
10 assure ourselves - and actually we went into that
11 pretty skeptical. We were going into it fairly not
12 believing that we were going to be able to do it.
13 Myself and the engineering manager, we were both of
14 the same mind that this is -- there is no way this can
15 be done.

16 But after going through that process, we
17 were both then just thoroughly impressed with the
18 level of technical expertise and the amount of
19 information that Toshiba does have, and has access to
20 the joint efforts at K-6 and 7 as well as the
21 designing their own plants in Hamaoka 5.

22 We basically - just an anecdotal story -
23 but we went through and we opened up the DCD, and we'd
24 go pick out a reference in DCD, and show us this. And
25 sure enough, Toshiba would send the engineer off and a

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 little while later he'd come back with the document,
2 here it is. And not only here it is, but here is the
3 guy that can explain it to you. These were guys that
4 were thoroughly versed in that calculation and can do
5 it. We'd open that document up, and we'd go through
6 it, and we'd look for references. Can you show us
7 this one? And later here the guys come with that one.

8 So we played that kind of an effort with
9 them, and in every case we tried, they were, here it
10 is.

11 VICE CHAIR ABDEL-KHALIK: But was the
12 documentation in Japanese or in English?

13 MR. MCBURNETT: A lot of it was in
14 Japanese, and was completed by Toshiba engineers in
15 Japanese.

16 MEMBER ARMIJO: Would you have
17 translation issues?

18 MR. MCBURNETT: The design basis for
19 South Texas will be created in English. So yes, that
20 is part of the Americanization in producing this
21 plant. The necessary record for South Texas. But as
22 I say it impressed us. And we came to the conclusion,
23 we did identify some gaps. I mean there are some
24 things that Toshiba did not have, and that we made
25 arrangements for - as I mentioned we had Westinghouse

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 in for safety analysis. There are some fuel design
2 through Westinghouse. There are some pieces that we
3 have other means to go obtain, and that is part of the
4 process.

5 (Simultaneous speakers.)

6 MR. MCBURNETT: So that was part of the
7 selection. And since that actually - on several
8 occasions since then, the NRC staff has had an
9 opportunity to meet with Toshiba in looking at things
10 like containment analysis and sump designs and some of
11 the other activities, as well as they performed an
12 independent vendor inspection in July. And they will
13 brief you on their conclusions later. But they
14 basically reached similar conclusions in their report.

15 MEMBER ARMIJO: I just want to make sure,
16 now you have identified, you have worked out all the
17 things that are proprietary to GE that you are either
18 going to have to create on your own, using Toshiba's
19 background.

20 MR. MCBURNETT: Toshiba has access to
21 that information. And has the capability to use it.

22 MEMBER CORRADINI: So I guess I want to
23 just follow up. Because then the discussion of the
24 overview, your colleague had mentioned the original
25 arrangement in '87 was that all parties concerned had

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 essentially equal access to the basic technology; is
2 that correct?

3 MR. MCBURNETT: Correct.

4 MEMBER ARMIJO: I am talking about
5 licensing topical reports. Are there any things like
6 that that you cannot use?

7 MR. MCBURNETT: The licensing of the
8 original application was submitted referencing I
9 believe there were like 13 topical reports. And when
10 we revise the application to move to Toshiba, we did
11 not use any of the topical reports, but the
12 information we needed to put into the actual
13 application itself as opposed to handling the
14 topicals. It was easier that way for us at that point
15 in time.

16 VICE CHAIR ABDEL-KHALIK: That makes it
17 easier for us to review as well.

18 MR. MCBURNETT: Yes, and the original
19 application, it made sense to break it up that way
20 when we revised it but Toshiba did not. It didn't
21 make sense to try to do that again.

22 All right, slide #24 is just the overall
23 schedule. I won't read all these to you. We
24 submitted it in 2007, and we're basically at the point
25 now where NRC has completed phase one, of the safety

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 review, and is writing the draft SER. I think we are
2 all probably up to speed on everything on that slide.

3 VICE CHAIR ABDEL-KHALIK: We can actually
4 continue, since we are presumably on the same topic,
5 we can continue until the scheduled break time of
6 3:15.

7 MR. McBURNETT: All right then.

8 As I mentioned to start with our goal was
9 to minimize departures. We have 23 Tier 1 departures,
10 and one Tier 2* departure. And there are Tier 2
11 departures in the application. The Tier 2 ones do not
12 require NRC approval, so they are under our control.
13 And we consider the departures of importance the ones
14 that are driving NRC review, which will be the Tier 1s
15 and Tier 2*s.

16 Slide #27 is a summary, and I will go
17 through each type of slide on each one of these in a
18 minute.

19 The really - this shows kind of the
20 grouping, and we had a couple related to essentially
21 new technology. We had about three of them that are
22 related to site parameters, a couple of corrections,
23 some enhancements, and then just some kind of
24 miscellaneous things we picked up that needed to be
25 either incorporated or addressed.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 So that is what the overall list is. I'll
2 head off to slide #28. The first one I'll talk about,
3 and this will get into the DAC question that was asked
4 a minute ago, safety related I&C architecture.
5 Currently the design certification was finalized in
6 1997, so I&C has moved a long way since then.

7 We really revised it to replace the
8 obsolete technology. We have changed the description,
9 the actual descriptions in the DC was hardware based.

10 We basically described the function based on what the
11 hardware did. We changed it to describe the function
12 of the hardware.

13 And then we've eliminated some unnecessary
14 logic, the activation logic.

15 I guess what I'd like Mike Murray, is my
16 STP and nuclear operating company's I&C manager
17 responsible for the I&C on this project, and I'd like
18 him to pick up the DAC question that was asked
19 earlier.

20 MR. MURRAY: Mike Murray. The DAC
21 question that was asked earlier, as I understood it
22 was, if it part of COL or is it post-COL. Our plans
23 are in the DAC process will be inspection process, and
24 it will not be a part of the COL. We are working with
25 - there is a pilot plant for the DAC process, and we

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 will be working with the Office Of New Reactors to
2 work through that process and develop it.

3 MEMBER SHACK: So your exception will be
4 to provide new updated DAC which you will then resolve
5 later? Is that the process?

6 MR. MCBURNETT: Not new DAC.

7 MR. MURRAY: No, we're not adding new
8 DAC. What we've done is, what we are doing, is
9 developing the implementation of processes and
10 procedures to implement that DAC, and have completed
11 some of those and have those available for review. So
12 for an example, we have a project level software
13 process plan that the vendors can come in, any vendor
14 that provides it has to follow the software plan which
15 has all the aspects of design on a verification
16 validation and that's our process.

17 MEMBER BROWN: But that is not all there
18 is to the substitution of the digital equipment for
19 the analog. I presume you are talking the analog
20 hardware base.

21 MR. MCBURNETT: Actually the DC is
22 digital.

23 MEMBER BROWN: Digital?

24 MR. MURRAY: It was an early version that
25 was entirely digital. The original design, the DCD

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 was a digital platform. The actual platform, I can't
2 tell you what that is.

3 MEMBER BROWN: That's okay. But I mean
4 is there a functional description that is going to be
5 provided as part of this?

6 MR. MCBURNETT: Yes, there is.

7 MEMBER BROWN: So there will be some
8 effort with pictures and diagrams to show independent
9 redundancy.

10 MR. MCBURNETT: Yes, that's in there.

11 MEMBER BROWN: And you'll talk about how
12 you implement it in the larger diagrams, and how you
13 implement whatever the DCD requires. All that will be
14 in there.

15 MR. MURRAY: That is correct. The design
16 functionality will implement the functionality as
17 described in the DCD.

18 MEMBER BROWN: Just to give you a heads
19 up, one of the things, since I am supposed to look at
20 this stuff, I will be looking at the independence of
21 those divisions, for both the safeguards and the
22 digital I&C applications. I had no idea what it
23 looked like before. I just want to see what it looks
24 like now, and how that divisional independence is
25 maintained. It's very important. Independence is

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 independence by the way; nobody talks to the other
2 one. I don't know what they are doing, but I'm just
3 giving you a heads up.

4 MR. MCBURNETT: Mike, you want to comment
5 on that?

6 MR. MURRAY: Yes, I understand. There
7 will be an opportunity to go through that in detail as
8 we go through the chapter reviews. And that would be
9 a good time for you to ask your questions on it.

10 MEMBER BROWN: That's fine.

11 MR. MURRAY: But we have - I'll say we
12 have improved the independence of the platforms with
13 the selection of hardware that we are going to
14 implement. You will be able to see that better when
15 we get to this chapter section.

16 MEMBER BLEY: We heard earlier you had
17 staff on board for operator training. Do you have the
18 schedule for this - do you have a schedule for this
19 pilot post-COL DAC closure process that you are going
20 to do? When is that going to get started, and when do
21 you expect to finish with respect to the field load
22 date, how far before that?

23 MR. MURRAY: The - our moving targets are
24 the first quarter of next year we will start that
25 process. And it'll be a continuous process as we go

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 through the design and development process of the
2 implementation of the process.

3 MEMBER BLEY: Thank you.

4 MEMBER BROWN: Unnecessary redundant
5 actuation losses, hopefully that will be clear when
6 you get the paperwork why it was unnecessary.

7 MR. McBURNETT: Yes.

8 MR. MURRAY: Yes, sir.

9 VICE CHAIR ABDEL-KHALIK: I guess I am
10 trying to understand something you said earlier, that
11 you were relying on the inspection process to verify
12 the acceptance of whatever design you ultimately end
13 up with that meets the DAC requirements. Now if you
14 are going to - based on your timeline, this has to be
15 done fairly early for you to have a real simulator.

16 MR. McBURNETT: The design has to be done
17 before the simulator. But the DAC closure doesn't.

18 VICE CHAIR ABDEL-KHALIK: All the details
19 have to be in place prior to this inspection process
20 for you to have a simulator that is a realistic
21 simulator. And is that information that you were
22 talking to Mr. Brown about in terms of providing
23 adequate details, for him to look at it in a lot of
24 detail.

25 MR. MURRAY: Yes, sir, let me explain the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 process, and it aligns with what your question is. We
2 are doing the detailed design on the platforms as we
3 are doing the process for the simulator. Those to
4 come together where we would be able to simulate those
5 processes in the simulator, to where they will have
6 the fidelity required to train operators.

7 In our schedule we have that brought
8 together, and coming together. As we go through that
9 process, with the pilot program, our intent is that we
10 will have as each let of the design is being
11 implemented, we will look for opportunities for those
12 inspections, or what we expect to see in a pilot, and
13 we haven't got total agreement on the pilot, because
14 that is what we are working towards with that. And
15 that gives us the opportunity, and the inspectors the
16 opportunity, to watch the design as it is being
17 developed and built.

18 MEMBER BROWN: Just remember, this is not
19 just software. You've got the division - we have real
20 hardware that has to execute software, and that is one
21 of the focal points. We want to see how it's done.

22 MR. MURRAY: And we certainly appreciate
23 the heads up and we'll be prepared to discuss that.

24 VICE CHAIR ABDEL-KHALIK: Please
25 continue.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. McBURNETT: All right, the next step,
2 a departure, also an enhancement is, we found a design
3 for a reactor core isolation cooling turbine-driven
4 pump that is substantially more simple and robust than
5 the traditional Terry Turbine pumps that we use in
6 most of that application in this country. It's a
7 monoblock design that has the pump and the turbine all
8 on one shaft all in one block. It eliminates the seal
9 leakage. It's water lubricated. The reason it ends
10 up being Tier 1 is that it also eliminates the
11 barometric condenser which was necessary to the seal
12 leak off. That's what - the only reason it gets into
13 this category.

14 VICE CHAIR ABDEL-KHALIK: Now as I recall
15 there was a topical report dealing with this.

16 MR. McBURNETT: There was.

17 VICE CHAIR ABDEL-KHALIK: Was this just
18 sort of carried over?

19 MR. McBURNETT: It carried over, and now
20 instead of the topical reports, the same material is
21 in the application, or similar material, I should say.
22 So developed by the Toshiba team to replace that, the
23 other material.

24 So we have - next slide, the - on the site
25 parameter, site-specific parameters, there were three

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 different things here. The minimum sheer weight
2 velocity, the VC specified 1,000 feet per second
3 minimum shear wave. There are some isolated areas
4 underneath the site that have less than 1,000 feet per
5 second, not particular significant from an overall
6 design standpoint, but it is different than what the
7 envelope is in the design certifications. That's
8 being addressed as departure.

9 Flood elevation, which is why we have the
10 above grade reservoir on site, we do have a flood
11 potential. The certified design does not include an
12 above-grade flood, so we've added added features to
13 protect it from flooding. As well as we're just
14 slightly outside the envelope, the DC, on maximum
15 precipitation and humidity. So those have been
16 addressed as a departure. Next slide.

17 This one falls into the category of a
18 correction. The feedwater line break analysis in the
19 certified design assumes that feedwater flow is
20 terminated. However, the design does not include any
21 features which terminate auxiliary feedwater flow. So
22 in addressing that issue we perhaps provided a safety-
23 related trip of the main feed pumps in order to
24 terminate feedwater flow. And now we're re-completing
25 the feedwater line break analysis, and the containment

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 analysis, based actually on revising that, including
2 that in the analysis.

3 What the - just to be clear - we also have
4 operator actions for 30 minutes to terminate feedwater
5 flows. So the actual analysis assumes a 30-minute
6 operator action time for when feedwater flows. So
7 it's conservative, it says 30 minutes when it actually
8 should be tripped much sooner by the automatic system.

9 But that is the -- so what that does is,
10 that causes redoing the feedline break analysis,
11 redoing containment analysis. Now there are a couple
12 of Tier 2 departures that sort of all out of that. We
13 have - normally Tier 2's don't require NRC approval,
14 but since we are changing methodologies, there are
15 also some changes in the tech specs on containment
16 analysis, we end up with a couple of Tier 2 departures
17 that require NRC approval.

18 In particular the containment analysis,
19 we're reflecting the feedwater line break, and we are
20 also requesting a change in the decay heat curves.
21 We're in the DC, we're non-conservative on a long term
22 basis.

23 And then we changed the containment
24 analysis. We changed the containment special
25 response. And all that impacts fuel-swell analysis.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 So that kind of all goes together, as two Tier 2s that
2 fall out of that correction of Tier 1 issue.

3 MEMBER STETKAR: Mark, I might have not
4 been listening clearly enough. You said -- I thought
5 you said safety-related trip of the feedwater pumps.

6 MR. MCBURNETT: Yes.

7 MEMBER STETKAR: The slide says, safety-
8 related trip of the condensate pumps.

9 MR. MCBURNETT: I'm sorry.

10 MEMBER STETKAR: It is the condensate?

11 MR. MCBURNETT: It's the condensate; I
12 misspoke.

13 MEMBER STETKAR: You don't have a
14 feedwater tank? Some plants have a large -- between
15 the condensate pumps and the feedwater pumps there is
16 a feedwater unit. Well, they give it different names.
17 The aerator tank, the feedwater tank. Does the
18 condensate pumps directly feed the feed pumps on this
19 design?

20 I'm thinking about inventory. You shut
21 off the feedwater pumps, you have no flow. You shut
22 off the condensate pumps, if there is a feedwater tank
23 in between, you still have flow.

24 MR. OIKAWA: My name is Hirohide Oikawa.
25 I am from Toshiba. As for the feedwater pump, it is

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 tripped by low suction head, so we have no concern
2 about the continuous feedwater operation. But for the
3 condensate pump, we've got to assure the safety of the
4 logic, the protection logic. That is the difference
5 of the responses of the feedwater pump and the
6 condensate pump.

7 MEMBER STETKAR: I guess I still don't
8 quite understand.

9 MR. JAIN: Let me -- I could actually --
10 when we calculated the total feedwater flow coming
11 from the BOP side, we did take into account the
12 inventory stored in that feedwater piping, the
13 feedwater heater. But as far as I know there is not a
14 separate tank.

15 MEMBER STETKAR: That's all I was asking
16 for. I am familiar with some plants that have a real
17 big feedwater tank.

18 MEMBER ARMIJO: I am still trying to
19 understand, what is being corrected? Was there a
20 deficiency in the existing DCD that you detected?

21 MR. MCBURNETT: What is being corrected
22 is the analysis that's in the DC, assume feedwater
23 flow stopped. There wasn't any thing in the DC that
24 stopped feedwater flow. And as soon as that comes in,
25 in Japan they use turbine-driven pumps. We are using

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 motor-driven pumps. That probably sets the stage
2 for how that occurs in the original design. That's a
3 little speculative.

4 VICE CHAIR ABDEL-KHALIK: Is there a
5 logical point to stop for a break.

6 MR. MCBURNETT: This is a good one.

7 VICE CHAIR ABDEL-KHALIK: At this time
8 we'll take a break for 15 minutes.

9 (Whereupon at 3:15 p.m. the proceeding in
10 the above-entitled matter went off the record to
11 return on the record at 3:30 p.m.)

12 VICE CHAIR ABDEL-KHALIK: We are back in
13 session.

14 Mr. McBurnett, would you please continue.

15 MR. MCBURNETT: Yes, go on to slide #31.

16 Other correction that we have included in
17 the Tier 1 departures in the application, the
18 certified design lists a diesel generator engine room
19 temperature limit of 50 degrees C. And it just has
20 the diesel engine, the actual controls in separate
21 areas. So what the design, the HVAC that's in the
22 design isn't capable of maintaining the 50 degrees in
23 worst case conditions, so we addressed that with
24 adjusting the temperature up a little bit. WE say all
25 the equipment that is environmentally sensitive is in

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 another area. This is really just the engine itself.

2 VICE CHAIR ABDEL-KHALIK: Within site
3 guidance on working in high temperature areas, 60
4 degree suits? I mean this - I mean there is - you
5 have to get some high level -

6 (Simultaneous speakers.)

7 MR. MCBURNETT: It's the scenario, the
8 worst case scenarios, and the running in accident
9 conditions, that you end up with those kinds of
10 numbers. So it's an area that doesn't have to have
11 access to it.

12 VICE CHAIR ABDEL-KHALIK: I mean when
13 people go into a high temperature areas, they have to
14 acquire approval if the temperature exceeds a certain
15 limit. I think it's what 140 F? Under no
16 circumstances they can go in.

17 MR. MCBURNETT: Normally it's not going
18 to be anywhere near that, normal operations it's not
19 going to be anywhere near that temperature. This is
20 the scenario where the engine has been running for
21 seven days, and it's the hottest time of the year, and
22 all these things have built up to give you that
23 maximum temperature. Normally it shouldn't operate
24 there.

25 VICE CHAIR ABDEL-KHALIK: Okay.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. MCBURNETT: I don't know if Scott, if
2 we have anybody else that is more versed than that on
3 the team. The controls and everything are in a
4 different area. We don't have to go into that.
5 Coley, do you have any additional --

6 MR. CHAPPELL: My name is Coley Chappell.
7 Just an experience, with this is the diesel generator
8 engine room, and the 140 degrees is consistent, in
9 line with, about the temperature of other types of
10 equipment spaces. It would not operate at that
11 temperature, and that would be the upper limit that's
12 approved by the manufacturer for that particular
13 equipment. But that would be an upper limit. That
14 would not be a normal operating temperature.

15 MR. MCBURNETT: Then moving into the list
16 of enhancements, the - on the - there are four
17 divisions of instrument controls, and there are three
18 divisions of sector related diesels, there are three
19 trains, three divisions. And there is a fourth that
20 is an I&C division. When one of those other trains
21 has on it a regulating transformer that provides for
22 the maintenance power to the system, and if you have
23 the UPS interrupt for the power supply out of service
24 for some reason. For some reason they did not include
25 that on the fourth division. Our suspicion is it was

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 an oversight in the detail in the certified design.
2 It doesn't really affect safety or safety issues, but
3 it provides maintenance capability to the system.

4 So we've added the regulating transformer
5 on the fourth division similar to what is on the other
6 three divisions for I&C.

7 MEMBER STETKAR: Did the original design
8 have four divisions?

9 MR. MCBURNETT: Yes. It has four
10 divisions, each division has its own --

11 MEMBER STETKAR: Okay, so this didn't add
12 a complete fourth division.

13 MR. MCBURNETT: It just added a
14 regulating transformer. You have to take the UPS out
15 of service for batteries of the inverter, so you have
16 a way to keep the channel powered.

17 MEMBER BROWN: Let me phrase that one
18 other way. You have four channels. Three have
19 regulating transformers; one did not. And all you've
20 done is add --

21 MR. MCBURNETT: That's all we've done.

22 (Simultaneous speakers.)

23 MEMBER BROWN: I thought it was a real
24 upgrade, not an enhancement.

25 MEMBER STETKAR: We're getting into a

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 list of things that aren't quite as interesting as the
2 first couple.

3 On top of slide #32, the residual heat
4 removal system, in the DC two of the RHR trains
5 provide spent fuel pool cooling. The third train did
6 not. And we've added so that the third train also
7 provides spent fuel pool cooling. That is just for
8 versatility during outages to give you the capability
9 to not have to schedule the trains as tightly when you
10 are in an outage condition to maintain spent fuel
11 cooling.

12 We've eliminated the hydrogen recombiners
13 consistent with 50.44. The - we have deleted main
14 steam isolation valve closure on scram, for high
15 radiation. This has been done by every BWR plant in
16 the country. It was a spurious trip activation. It's
17 not used in any safety analysis. Call it a spurious
18 trip. And it's all been eliminated, now we're
19 eliminating it from the ABWR as well.

20 And on 33, the - the reactor pressure, the
21 reactor internal pump motor casing, the certified
22 design says there is no cladding inside the motor
23 casing for the RIP pumps. But indeed every RIP pump
24 that has been built for K-6/7 and all the other plants
25 has some areas inside of it that does have some

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 stainless steel cladding on it. So we addressed that
2 to reflect what is actually in the design and intended
3 to add to the description of the cladding.

4 The rad waste building substructure has
5 been reclassified as non-seismic. This is the
6 consistent with the current version, Rev. 2, of Reg
7 Guide 1.143. Apparently that was in some state of
8 flux back in the mid-'90s when this was originated, so
9 we basically brought it up to the current Reg Guide
10 revision.

11 And on control system inputs testing
12 hardware we've clarified some of the safety testing of
13 the rod control power supplies.

14 On 34, there is some changes we made in
15 the breaker fuse coordination, clarifying how the
16 breaker fuse coordination works in the design, as well
17 as there is a requirement in for testing in the plant
18 at minimum voltages, which we really can't do as
19 installed in the plant. Minimum voltage testing has
20 to be done in the shop, or in the vendor's shop. So
21 that is reflected in the change.

22 MEMBER BROWN: When you show these, or
23 when you present these, are you going to show what it
24 was, and then what it is now, so that the change is
25 understandable, as opposed to just seeing what it is

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 not and trying to figure out what it was before?

2 MR. McBURNETT: Yes, go to the chapter
3 reviews, certainly. What you see when you - the
4 application, is line-in and line-out markups. So you
5 can see what was taken out.

6 MEMBER RAY: That is a little bit
7 different than what you are addressing.

8 MEMBER BROWN: I know.

9 MR. McBURNETT: He is looking for a
10 little bit clearer comparison.

11 MEMBER RAY: Here is the issue. At you
12 looking at changes, or are you looking at prescription
13 of design changes? And the second thing is what we
14 are looking for - the first thing is what we get,
15 okay. And we probably should leave it there for now.
16 We have to figure it out when you are given textual
17 changes what the design change was. This
18 presentation I think we should leave it. I think he's
19 got the point.

20 VICE CHAIR ABDEL-KHALIK: We'll see on
21 Saturday as to what is the optimal way for us to
22 review these modifications.

23 MEMBER RAY: It's easy to say what's
24 optimal. What's achievable is a different thing.

25 MR. McBURNETT: All right, slide #35. We

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 did have one Tier 2* departure. Like I said, we
2 didn't go -o- we're trying to minimize the number of
3 departures, so we haven't done a lot of wholesale
4 changes to codes and standards. We did go through and
5 strategically determine where we needed to address
6 codes to a later code revision. And so that's what we
7 have here as Tier 2* change that goes through a number
8 of changes to reference the revision numbers of codes
9 and standards, in each case changes to a later
10 approved revision. And so that's what have as Tier 2*
11 changes. It goes through a number of changes to
12 reference just a revision number for codes and
13 standards, in each case coming to an existing approved
14 version.

15 And also departures in technical
16 specifications, really there are nine of those that
17 fall out of some of the Tier 2 changes. We talked
18 about containment analysis earlier; that was one of
19 them. We've also changed the plant voltage
20 distribution system. The certified design has --

21 VICE CHAIR ABDEL-KHALIK: Has the GOTHIC
22 code been approved, been reviewed and approved by the
23 staff?

24 MR. JAIN: The GOTHIC code has been
25 approved for Mark 1 containments and we have submitted

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 a topical to expand this application to ABWR
2 containment design. And that is under review right
3 now.

4 MEMBER CORRADINI: Just, could you
5 repeat?

6 MR. JAIN: Currently we have approval for
7 Mark 1.

8 VICE CHAIR ABDEL-KHALIK: Mark 1, okay.

9 MR. MCBURNETT: Actually, the plant
10 medium, the project system, the certified design has a
11 single voltage system, 6.9 kV. We've changed it what
12 is much more typical in the U.S., a dual voltage, a
13 13.8 and a 41.16, just makes it easier for us on
14 motors and pumps and motors and valves and wires and
15 things.

16 That reflects a Tier 2 change but it
17 reflects in the tech specs. That's where it comes in
18 as a tech spec change that has to be approved.

19 VICE CHAIR ABDEL-KHALIK: How far are the
20 switchyards for the new units from the existing units?

21 MR. MCBURNETT: The new units do have
22 their own switchyard, and it is - this is an estimate,
23 but it is probably 500 feet west. Does that sound
24 about right, guys, Scott? How far? How far the
25 switchyards are apart, the existing switchyard from

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 unit #1 from unit #2 from units #3 and #4.

2 MR. MORRIS: This is Scott. And Ed, I'm
3 sorry, I don't know how to answer that question. It's
4 a long way.

5 MR. MCBURNETT: The plants are about
6 1,000 feet apart. So the switchyards, that's an
7 estimate. Not miles, and not real close.

8 MR. HEAD: There's actually - don't we
9 have a picture at the end of the presentation?

10 MR. MCBURNETT: It doesn't show the
11 switch yard on it. We can get that information.

12 The other technical specification changes,
13 a number of editorial changes in the technical
14 specifications, really don't change any of the intent.

15 Thirty seven, there are some other notable
16 Tier 2 departures. A couple have already been
17 mentioned. One I kind of lump altogether here, on rad
18 waste, liquid, solid and gas as rad waste, the
19 certified design basically reflected technology that
20 was back in the '80s vintage, evaporators and
21 concentrators and incinerators and things that we just
22 don't install in plants now. We don't use them.
23 Instead we go to modulate systems, and the rad waste
24 system, we take a Tier 2 departure, to upgrade all
25 that to the current technology. It's the same rad

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 waste building that you are going to see in other
2 applications, or very very similar in concept.

3 And then on the slide #39, ECCS section
4 strainers, we have, recognizing strainer technology
5 has changed significantly since 1997, we have upgraded
6 the strainer design, and have a commitment to meet the
7 latest revision of reg guide 102.

8 That kind of concludes all my discussion
9 of departures. Any other departure-related question.

10 Clearly they will all be gone over in much more
11 detail, and we will work to provide information in a
12 way that works better for the individual chapter
13 reviews.

14 The last item on our list, steel design
15 and licensing. And Bob Quinn from Westinghouse is
16 going to present this.

17 I did want to do a little bit introduction
18 for it. The - we are going to talk about our strategy
19 on fuel. From the very beginning when we first
20 submitted, we had realized that the fuel design that
21 is in the certified design dates back to 1997. We
22 realized that if we changed the fuel design at that
23 point, we in all likelihood by the time we bought fuel
24 in the 2013 timeframe, we'd be changing the design a
25 second time.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 We looked at it and said, that's two
2 steps. Why do we need to do it twice? We'll do it
3 once, we'll do it after COL. We talked to the staff
4 about that, and we don't spend your resources, we
5 don't spend our resources, we can do this more
6 effectively just doing it one time, one submittal, one
7 review. And all agreed that that was the best answer.

8 So our strategy has been for licensing
9 based on this fuel design, this insert by design. We
10 will submit a fuel amendment shortly after COL that
11 will hopefully put the fuel design that we would plan
12 to use in the first cycle.

13 MEMBER ARMIJO: Now that is an amendment
14 to what?

15 MR. MCBURNETT: To the COL.

16 MEMBER ARMIJO: To the COL.

17 MR. MCBURNETT: That's the strategy for
18 handling that, and it continues even as we have
19 changed vendors being the right strategy for us. Now
20 at this point we have Westinghouse set up to do that
21 analysis and provide that fuel design and develop
22 analytical tools or modify their analytical tools to
23 be able to support that. And I'll ask Bob to go
24 through the process that they are going to - and we've
25 also agreed with the staff and had - have scheduled

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 for getting to that point.

2 MR. QUINN: Yes, I wanted to touch on it
3 briefly, slide #42 in the package talks about the
4 status and schedule for our path forward on fuel for
5 STP three and four. As Mark mentioned, Westinghouse
6 will be providing that fuel, and will be providing the
7 supporting evaluation and analysis for that. So
8 Westinghouse has a number of topical reports that we
9 are planning to submit; a couple we've already
10 submitted. IN order to expand our safety analysis
11 methodology to cover the BWR designs. There is a
12 total of 11 topical reports that are being submitted. Two of
13 them are new topical reports, one on transients, and
14 one on facility analysis. There is one topical that
15 we are revising; that's on the reload methodology.
16 That's to cover ABWR. And then there is a total of
17 eight supplements to topical reports that are already
18 reviewed and approved by NRC for various applications
19 for Westinghouse. Those cover basically the rest of
20 the analytical area, the transients, LOCA containment,
21 and the control rod blade design.

22 So we've come in, met with NRC staff in
23 January, went through the list of topical reports. We
24 have submitted two of those already. They are both
25 supplements, one in September, one in October. Then

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 next year the bow wave comes if you will. We have one
2 topical that will be coming in in April; four more in
3 June; four more in September. In our meeting with
4 staff we talked about the schedule and our need for
5 reviews of those topicals. And I think we have a
6 schedule that we can work with, in terms of getting
7 our submittals done next year and having the reviews
8 done in time and approvals in place to support the
9 development of the fuel amendment to the COL sometime
10 in the 21st century. So that is our current plan. Any
11 questions?

12 VICE CHAIR ABDEL-KHALIK: Are there any
13 questions for STP or Westinghouse?

14 MEMBER ARMIJO: I don't know what's
15 customary, but is it Westinghouse's or South Texas'
16 expectation that these LTRs will be reviewed by ACRS?

17 MR. MCBURNETT: Whatever your process is.

18 VICE CHAIR ABDEL-KHALIK: It is up to us
19 to decide.

20 Any other questions?

21 Well, at this time we are ready to hear
22 from the staff. And I guess the focus of this
23 presentation --

24 MR. HEAD: We note the conclusion slide
25 does have two switchyards on it. And just for

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 reference, the buildings down there at the bottom,
2 those are larger than a football field, and the
3 distance is around 600 feet. So while I can't give
4 you the exact perspective, you can see it there.

5 VICE CHAIR ABDEL-KHALIK: Thank you.

6 So at this time we will hear from the
7 staff. The first group will be on the qualification
8 of offerors, vendor, and if possible on the timeline
9 that we will use.

10 (Comments off the record.)

11 NRC STAFF'S PLAN FOR STP COLA REVIEW

12 MR. TONACCI: Okay, well, I am Mark
13 Tonacci. I am the branch chief of the ESBWR/ABWR
14 projects two branch. Relatively new in that role.
15 But George Wunder is the lead project manager, and has
16 been with this project since the beginning.

17 We will talk briefly about the timeline
18 and the work that is coming out way, and by
19 correlation, to you, and then George gets the more
20 interesting part, which is talking about the alternate
21 vendor, and work we did looking at the alternate
22 vendor qualifications.

23 So with that, I will talk briefly here
24 about the work that is ongoing, licensing work. We
25 have been talking predominantly about the COL safety

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 review, and you can see the dates there. We received
2 the application in September of '07. We've gone
3 through phase one, and we're in the midst of the
4 review of phase two which will wrap up in April of
5 next year. We are closing down the chapters now, and
6 trying to close out questions on open items. The
7 chapters will be coming to ACRS for review in March.
8 There are a number of presentations already scheduled
9 in March of next year, one in May, and then we hope to
10 wrap up in June. And we hope to exit phase three,
11 which is the safety-related SERs with Open Items by
12 August. And then roll into phase four, five and six.

13 We also were talking about the design
14 certification aircraft impact amendment to the DC. We
15 received that some months back; we have not yet
16 approved the schedule. We have it. We've gone through
17 the docketing review, but we have not published a
18 formal schedule for that, but we are very close. As a
19 matter of fact the letter is in concurrence now.

20 We do have coming to us next week a
21 request for a limited work authorization to do some
22 work, and STP is trying to get a head start on some
23 work they can do that does not need our approval.
24 There is a question about a retaining wall and whether
25 or not it can or cannot be left there. They are going

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 to formally submit that work authorization to us, and
2 we will take a look at it and see if it needs our
3 approval, and if we have go through the reviews, or if
4 it doesn't meet our approval, in which case they are
5 allowed to go on and never pursue any further. So
6 obviously we have not developed a schedule for that
7 work yet.

8 We just talked about the fuel topical
9 reports. We have a couple; the rest will be coming in
10 next year. Clearly you want to get those done over
11 the next couple of years and completed before the
12 formal license amendment, which will be coming to us
13 tentatively planned in 2013. So the idea is to get
14 the fuel topical reports reviewed, and then when we
15 receive the license amendment in 2013, we'll work our
16 way through that. Obviously that schedule is not
17 developed either.

18 MEMBER SHACK: When are they going to
19 submit the updated PRA? Is that going to be part of
20 the COL?

21 MR. TONACCI: George, do you have
22 anything on that?

23 MR. STILLWELL: I'm Bill Stillwell. I'm
24 the PRA supervisor for South Texas Units #3 and #4.
25 Are you talking about the PRA that we have to update

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 to support the COL, or the PRA that we have to have to
2 support operation over 60 years? Exactly two
3 different PRAs.

4 MEMBER SHACK: Both.

5 (Laughter.)

6 MR. STILLWELL: -- is in fact complete,
7 and we are using it now to support DRAP activities as
8 detailed design moves forward.

9 MEMBER SHACK: This meets all applicable
10 standards?

11 MR. STILLWELL: No, this is in accordance
12 with Reg. Guide 1.206. This is an approved PRA. If I
13 have significant design changes, or changes to plant
14 design, then there is a question whether I have to
15 meet current closing standards, but we got through
16 that with no significant changes. So in accordance
17 with Reg Guide 1.206 And C3.119, as long as there is
18 no significant changes, the PRA doesn't have to be
19 modified, but I have to incorporate the design changes
20 into the plan-specific PRA. So there were no
21 significant design changes in accordance with the ASME
22 standard, so I have a PRA to support total licensing
23 that was done in the late '80s, early '90s. It looks
24 like an IPE plus a little bit. So if you think back
25 to the early '90s, this was a pretty good IPE, plus a

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 pretty good discussion of low power shut down, a
2 pretty good discussion of some of the external events.

3 They used five as a screening methodology for fires.

4 They did separate margins analysis, because that is
5 the stage of design and that was the most efficient
6 way to look at seismic events.

7 But that is the PRA we have to support
8 COL. Once we have the application, once we have the
9 application approved, we have to have a PRA that meets
10 current codes and standards that the NRC approves at
11 fuel load with standards one year prior to fuel load.

12 That PRA has actually started. We started that work
13 in May. By next year, the end of next year, or the
14 early part of 2011, we will have completed the level
15 one/level two almost some external events PRA, and
16 we'll go through - we're setting ourselves up to go
17 through peer review. So peer review will actually
18 start for us in 2011, and we'll go through the peer
19 review, and incorporate facts and observations from
20 the peer review, 2011, early 2012. At that point we
21 get a code, and then we get to come back and talk to
22 you about all the exciting stuff.

23 MEMBER APOSTOLAKIS: So the peer review
24 is the NEI peer review?

25 MR. STILLWELL: It's the ASME peer

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 review. The ASME standard peer review. Which is
2 NEI-plus. But yes. It's the ASME requirements --

3 MEMBER APOSTOLAKIS: That's a PRA that
4 you can keep in your headquarters, and if anybody
5 wants to look at if they have to come there.

6 MR. STILLWELL: Yes. Except the results
7 will be summarized and be part of the FSAR, Final
8 Safety Analysis Report.

9 VICE CHAIR ABDEL-KHALIK: Thank you.

10 MEMBER APOSTOLAKIS: What is the logic of
11 using PRA or for lesser quality for the COL? And then
12 jump up to a much higher standard? I can understand
13 why you need the PRA for the 60-year operation. But
14 it seems there is a huge gap there. Is it just a
15 matter of convenience.

16 MR. STILLWELL: It is a matter of timing.
17 When was this design certified? What existed when
18 the design was certified, how the rules evolved, and
19 in effect this is what we have.

20 MEMBER APOSTOLAKIS: Okay.

21 (Comments off the record.)

22 VICE CHAIR ABDEL-KHALIK: Continue.

23 MR. TONACCI: That concludes this portion
24 of my presentation, and we will go to the ultimate
25 vendor qualification with George.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. WUNDER: Thank you. Good afternoon,
2 Mr. Chairman. Thank you very much for the invitation.

3 We are very grateful to be here to talk with you this
4 afternoon.

5 Our original plan was to have to have the
6 individual chapter PMS talk to the subcommittee about
7 their chapters and talk to you about the technical
8 challenges they had and about the focus of the staff's
9 effort. Our schedule got a little bit rearranged so
10 we are here talking to you on a day when most of the
11 chapter PMS are in training.

12 The good thing is that we have the
13 opportunity to talk to the entire committee.
14 Unfortunately I cannot address the individual chapters
15 in the depth that could do them justice, as could the
16 individual chapter PMS. So with that in mind we ask
17 and South Texas graciously agreed to give a little
18 more in depth presentation on their departures.

19 As you have probably already concluded,
20 much of the staff's review effort will be on the
21 departures and the supplementary information that has
22 been proposed by South Texas, because the certified
23 design itself, it has finality and it is not open to
24 staff review.

25 We hope, and I think because of the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 questions you were asking the applicant, that the
2 present that STP gave of their technical departures
3 has provided you with some of the insights into where
4 the staff will be focusing its review efforts.

5 What I'd like to talk to you about is an
6 overview of the staff's alternate vendor qualification
7 review, and I would also like to give you our proposed
8 schedule for presenting the staff's SER to you.

9 You learned from the applicant's
10 presentation that the design for what was the General
11 Electric advanced boiling water reactor will be
12 supplied to South Texas by Toshiba. That makes
13 Toshiba what we call an alternate vendor, and the rule
14 allows for an alternate vendor to supply a certified
15 design provided that they are demonstrated as
16 qualified to do so.

17 This is the first time we have had to
18 exercise this particular provision in the rule, so we
19 had to decide amongst ourselves on the staff, what
20 does it mean to demonstrate qualified. Well, we knew
21 that the applicant was going to do a due diligence, so
22 we said to ourselves, let's ask them to submit a
23 summary of that effort for formal staff review, and
24 then once we have reviewed that we will be better
25 informed as to what additional information we might

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 need, as well as to what types of inspections, audits,
2 requests for additional information, we may need to
3 send out.

4 MEMBER ARMIJO: Let me just ask one quick
5 question. When the new certification is issue, or
6 amended certification is issue, now what is the status
7 of that? Can any facility reference that, whether
8 it's applied by Toshiba or anyone else?

9 MR. WUNDER: Can they reference it?

10 MEMBER ARMIJO: Yes, who --

11 MR. WUNDER: The design is owned by the
12 people.

13 MEMBER ARMIJO: All right, so any
14 supplier could take that existing amended certified
15 design and market it. Separate from business issues,
16 I'm just talking regulatory.

17 MR. WUNDER: If they are qualified.

18 MEMBER ARMIJO: So let's say GE had a
19 customer, and they came in and said, hey look, we
20 really like this amended design here . We're going to
21 reference that and our customer is going to buy it
22 from us. Is that a problem for the NRC?

23 MR. WUNDER: No.

24 MEMBER ARMIJO: Okay.

25 It may be a business problem, I don't know

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 that. But not from a regulatory standpoint.

2 MR. WUNDER: It's allowed in the rules
3 for anyone who is being qualified to provide the
4 design.

5 MEMBER CORRADINI: So the issue is the
6 qualification of a third party?

7 MR. WUNDER: Yes, sir.

8 (Comments off the record.)

9 MR. WUNDER: We also, what we did when we
10 were trying to think of what does it mean to be
11 qualified, we came up with a list of fundamental
12 questions that we decided to ask ourselves during the
13 course of our review. And these are things like, what
14 information might be necessary to supply a design that
15 might be proprietary, copyright protected, patented,
16 or otherwise unavailable to the alternate vendor? How
17 does the applicant propose to fill any design basis
18 gaps that might result from this information not being
19 available? What has South Texas done to assess the
20 alternate vendor's ability to reconstitute necessary
21 information? Has South Texas done an adequate job of
22 scoping, that is, have they done an adequate job of
23 looking around to determine what information is in
24 fact necessary? Have they circumscribed that
25 properly?

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 Then we looked at the alternate vendor
2 itself. And we asked questions like, can they assume
3 the duties normally assigned by a plant vendor? Can
4 they manage design changes and support the licensing
5 process? And can they address the differences between
6 the designs they have already made and built, and the
7 U.S.-certified ABWR?

8 So there were basically two parts to the
9 staff review, the review of due diligence
10 documentation, and the audits and inspections.

11 So we did our review of the applicant's
12 due diligence, and we decided that we would like to
13 look deeper into some areas regarding alternate vendor
14 qualifications. The SER isn't public yet, so I don't
15 want to touch on things that are pre-decisional, but I
16 think I can safely point out some of the things that
17 we identified.

18 We identified some questions in the area
19 of pressure-temperature limit methodology and fluence,
20 and our questions and the applicants' responses in
21 this area are going to be detailed in Chapter 5 of our
22 SER. We identified some issues in containment
23 analytical model and hydrodynamic loads, as you might
24 well have guesses, and the resolution of these are
25 going to be detailed in Chapter 6 of our SER, and of

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 course there are always issues with instrumentation
2 and control, which will be discussed in Chapter 7 of
3 our SER.

4 And both instrumentation and control and
5 quality assurance are parts of the staff's alternate
6 vendor inspection.

7 So armed with this information, informed
8 by our review of the due diligence summary, we sent a
9 team in Japan in July to help with our independent
10 assessments of the basis for South Texas'
11 determination of vendor qualifications. The team
12 consisted of nine people, they were there for a week.

13 We looked at Toshiba's Part 21 program, their
14 Appendix B program. We looked at how they do design
15 controls, their procurement of a document control
16 program. We looked at control of purchased materials,
17 corrective action program, training and qualification
18 programs, and the initial test program.

19 And in instrumentation and control we took
20 a look at how Toshiba intends to design and integrate
21 several safety and non-safety related digital I&C
22 systems.

23 So in our alternate vendor qualification
24 effort we conducted document reviews as well as audit
25 - yes, sir.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 MEMBER BROWN: How many people did you
2 send on this team?

3 MR. WUNDER: There were nine on the team.

4 So we conducted document reviews, as well
5 as audits and inspections. The staff's alternate
6 vendor qualification effort will be discussed in
7 Chapter 1 of our SER. Technical issues that arose
8 during our review may be addressed in various chapters
9 of the SER, 6 and 7, 5; that's all that I can think of
10 right now. And the at results of the staff's
11 inspections are available. The inspection report can
12 be found in ADAMS at a section number ML 09237079.

13 MEMBER ARMIJO: Since so many of the
14 documents were in Japanese, what exactly were you
15 reviewing when you did a document review?

16 MR. WUNDER: We were -- a lot of it - we
17 weren't reviewing Japanese documents. We were
18 reviewing American documents, General Electric
19 documents. Largely what we were trying to do was to
20 look at things that were proprietary or formed the
21 design basis for the ABWR and determine which of those
22 may not be available to the alternate vendor. And
23 then when we had a question there we would determine
24 whether or not they add access to it or they could
25 reconstitute it, or how they were going to get around

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 the problem that that posed.

2 Okay, the final subject, we have been
3 working with the staff, and our plan is to present our
4 SER to the ABWR subcommittee over the course of five
5 meetings between early March and late May. If anyone
6 has presented anything here today that has piqued your
7 interest and led you to think that additional
8 subcommittee meetings may be necessary, we will be
9 more than happy to work with your staff to support
10 anything that you would like in that area.

11 I guess our plan is that the next time we
12 will meet with you gentlemen altogether is going to be
13 in June, if all goes well.

14 VICE CHAIR ABDEL-KHALIK: Are there any
15 questions for either Mark or George?

16 MEMBER ARMIJO: I don't know if we've
17 received it, but I'd like a list of all the licensing
18 topical reports in the fuel area.

19 VICE CHAIR ABDEL-KHALIK: We'll get that
20 for you.

21 MR. TONACCI: Many of those we haven't
22 received yet.

23 MS. BANERJEE: Not all of them are
24 submitted yet.

25 MEMBER ARMIJO: At least we know the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 titles. We should know the titles by now.

2 MR. WUNDER: We do have a list of
3 anticipated and a schedule for when they are supposed
4 to finish.

5 MEMBER RAY: Let me just piggyback on
6 that. It's interesting that these are referred to as
7 topical reports, and they are confined to the fuels
8 area. In other contexts we are familiar with
9 technical reports that are submitted in support of
10 licensing -- I don't know where that name comes from
11 precisely. But in any event --

12 MR. WUNDER: I think it is probably
13 important to note that the COL review and the granting
14 of the COL review and the fuel amendment are separate
15 and independent entities.

16 MEMBER RAY: That's a good point, that is
17 a relevant distinction in terms of the terminology.
18 But I think it might be the case that if there are
19 these technical reports that you are talking about
20 submitted to the board of licensing that we have them
21 also listed and available so that they can be
22 requested by members to review in the very same way
23 that the topical reports are. That's all I'm saying.

24 MR. WUNDER: And we can do that, and I
25 believe the - for example in the area of containment,

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 for the COL itself, those are in fact technical
2 reports that are submitted, and they are submitted on
3 the docket and become a part of the application, which
4 is different than a topical report which under our
5 procedures is treated very very differently.

6 MEMBER RAY: I do understand that, and I
7 just wanted to add technical reports, because
8 ultimately what we are looking for is the opportunity
9 to recognize areas of technical review that we can be
10 efficient in focusing attention to, and the technical
11 report as opposed to the COL itself is often a way of
12 recognizing here is an area where this thermal
13 hydraulics or whatever it happens to be, structural
14 mechanics, would that be identified for review.

15 MR. WUNDER: Yes, sir.

16 MEMBER BROWN: You said you plan to
17 present to the full committee in June, 2010. Is that
18 the ultimate vendor qualification?

19 MR. WUNDER: No, sir, that will be the
20 staff's SER for the COL. SER with open items. That
21 will be part of it.

22 MEMBER BROWN: Okay, that is the phase
23 two?

24 MR. WUNDER: That is the phase two
25 product.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MEMBER BROWN: You said June, are there
2 some other dates in the --

3 MR. WUNDER: Yes, sir, I'm sorry, the
4 Phase 2 product we intend to present to you gentlemen
5 in June.

6 MEMBER BROWN: This thing says August.

7 MR. WUNDER: That is the completion of
8 Phase 3, sir. Phase 3 is done after we receive your
9 letter and respond to it, I think.

10 MEMBER BROWN: Okay, I got you.

11 VICE CHAIR ABDEL-KHALIK: Are there any
12 other questions from the committee to either the staff
13 or STP?

14 MEMBER MAYNARD: Since we have a little
15 bit of time here for the staff, the revision to the
16 DCD, now does the previous board - is it still valid,
17 or does this replace the previous DCD, approved DCD?
18 If another applicant came in later, could they
19 reference either?

20 MR. WUNDER: I am going - I don't want to
21 get in trouble on this. I know there is talk of doing
22 things differently. This will be I believe revision
23 five to the DCD, and I believe that what will happen
24 is, it will replace entirely revision four. So the
25 only thing that changes in the rule is in Appendix A

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 there is a revision number. Currently it reads
2 revision four, and it will read revision five. So
3 that will replace the existing rule.

4 VICE CHAIR ABDEL-KHALIK: It may happen
5 naturally. There is a 15-year limit.

6 MEMBER MAYNARD: Yes, that runs out in
7 2012. It really has nothing to do with our review.
8 But it just seems interesting to me that somebody can
9 get an approved design, somebody else could come in
10 and ask for a change to that, and then if somebody
11 wanted to come - the original supplier wanted to do
12 the original job, they'd have to come in and get that
13 revised again?

14 MEMBER ARMIJO: No, I think I - that was
15 my question. I think it's an existing amended DCD
16 that anyone who is a qualified vendor could reference.

17 MEMBER CORRADINI: But Otto's point is
18 well taken. It just turns out that the way this is
19 very revised under DCD is simply for aircraft impact,
20 right? So that is minimal. But somebody could, based
21 on your logic, somebody could come in and say, I want
22 to change major portions of this to a new rev, and the
23 old one would disappear, and you would have to go and
24 change the new one.

25 VICE CHAIR ABDEL-KHALIK: It is a non-

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 issue in this case. We are subject to a 15-year
2 limit.

3 Are there any other questions for either
4 the staff or STP?

5 MEMBER BROWN: Yes, I just thought of one
6 if you don't mind. And it's probably because I just
7 didn't quite understand.

8 When you made the comment relative to the
9 translation issue, and you answered, no, we reviewed
10 GE documents that were going to be able to Toshiba,
11 Toshiba, for their work design, whatever. I didn't
12 hear anything about evaluating Toshiba relative to
13 their actual capabilities themselves, other than - all
14 you did is talk about you reviewed for vendor
15 qualification just the GE documents that they would
16 have available for you.

17 MR. WUNDER: Right, there are two parts
18 to our evaluation, and I shouldn't have just said GE;
19 I should have said design basis documents.

20 MEMBER BROWN: But those are GE
21 documents.

22 MR. WUNDER: Yes, many of them are;
23 probably most of them are.

24 MEMBER BROWN: But you didn't translate
25 from Japanese?

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. WUNDER: No, no, we had two parts to
2 our evaluation. Basically it breaks down like this.
3 In order to determine that an entity is qualified, we
4 said, well, let's think about this in basic terms.
5 What does that mean? Well, first off, they've got to
6 have the information that is necessary to provide the
7 design. And then given the information they have to
8 be able, they have to have the ability, to take the
9 information to turn it into a design. And that, those
10 abilities were assessed in our inspection in Japan and
11 documented in that inspection report. That's where
12 our - the majority of our work toward assessing
13 Toshiba's capabilities were.

14 MEMBER BROWN: So all that list of eight
15 items were in Japanese?

16 MR. WUNDER: No, sir. No, sir, those are
17 areas that we identified when we were doing our review
18 of the design basis documentation. We looked at it.
19 We said, in what areas might there be issues with
20 South Texas and their chosen alternate vendor not
21 being able to provide the design because the
22 information is not there, or they have decided to
23 change their approach or something like that. So we
24 identified these areas. We identified pressure-
25 temperature limits. We identified hyperdynamic loads.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 We identified I&C. All these things where we wanted
2 to either assess further Toshiba's capabilities, or
3 determine for ourselves that South Texas-Toshiba,
4 their contractors, were able to obtain the necessary
5 or information or reconstitute it.

6 MEMBER BROWN: These items were their
7 capability, not GE documents?

8 MR. WUNDER: Part 20 - no, no, excuse me,
9 the list that you are showing me now, those are the
10 major areas of our inspection in Japan of Toshiba.

11 MEMBER BROWN: Of capabilities?

12 MR. WUNDER: Yes, sir.

13 MEMBER BROWN: Okay, not the GE
14 documents? Their capabilities?

15 MR. WUNDER: Yes, sir.

16 MEMBER BROWN: Okay. I didn't get the
17 separation.

18 MR. WUNDER: I probably didn't explain it
19 well.

20 MEMBER BROWN: I doubt that.

21 VICE CHAIR ABDEL-KHALIK: At this time
22 the schedule calls for committee discussion. Yes,
23 sir?

24 MR. HEAD: Just standing; sorry.

25 (Laughter.)

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 VICE CHAIR ABDEL-KHALIK: We can go
2 around the table, if people would like to offer any
3 remarks on either of the two sections at this time.
4 Jack?

5 MEMBER SIEBER: I have no remarks.

6 VICE CHAIR ABDEL-KHALIK: John?

7 MEMBER STETKAR: No.

8 VICE CHAIR ABDEL-KHALIK: Dennis?

9 MEMBER BLEY: Yes, I really appreciated
10 the briefing. I am really please to see the several
11 areas they are moving ahead very aggressively on.

12 VICE CHAIR ABDEL-KHALIK: Dana.

13 MEMBER POWERS: I will probably have
14 extensive remarks on this session on Saturday.

15 VICE CHAIR ABDEL-KHALIK: Bill, Sam?
16 Mike? Harold?

17 MEMBER BROWN: I made my points.

18 VICE CHAIR ABDEL-KHALIK: Mike?

19 MEMBER CORRADINI: No, I just appreciate
20 the presentations by Toshiba and the staff.

21 VICE CHAIR ABDEL-KHALIK: George?

22 Well, thank you very much. At this time I
23 would like to express our appreciation to STP and the
24 staff for a very informative presentation.

25 I will turn it back to Mr. Chairman almost

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 an hour ahead of time.

2 CHAIR BONACA: So we will take a 30
3 minute break, until 20 of 5:00, and then resume the
4 meeting then.

5 (Whereupon, the above-entitled matter went
6 off the record at 4:21 p.m.)

7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com



U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

Amendment to the AP1000 Design Control Document (DCD) Presentation to the ACRS

Eileen McKenna

NRO/DNRL/NWE2, Chief

November 5, 2009

Briefing Purpose and Agenda

- Status briefing regarding proposed AP1000 design certification amendment (DCA)
 - application
 - staff review
 - Committee presentations
- Update on reference combined license (RCOL) application

AP1000 Design Certification Amendment

- Current AP1000 Design Certification - Appendix D to 10 CFR Part 52 (Revision 15 to the AP1000 Design Control Document (DCD)) – effective 2006
- Safety Evaluation Report – NUREG-1793, “Final Safety Evaluation Report Related to Certification of the AP1000 Design”
- Post-certification Activities
 - NuStart Submittal of over 100 Technical Reports (TRs) beginning in 2006(list of TRs provided separately)
 - Staff Review of TRs – which address aspects of AP1000 Design and COL information items (in support of specific DCD changes)
 - Topics with multiple TRs include seismic, HFE, I&C, components

Application for Design Certification Amendment

- Application of May 26, 2007 based upon Revision 16 to the AP1000 DCD
- Reference to 10 CFR Part 52, Section 52.63 – Finality of Standard Design Certifications
- Submittal of Revision 17 of the AP1000 DCD – September 22, 2008
- RAI responses leading to DCD changes
- Revision 18

Review of the AP1000 DCA

- Six phase review schedule
- Review is focused on changes proposed by Westinghouse, using SRP-based review
- Issuance of Individual Chapters in Phase 2 (SER with Open Items [SER/OIs]) to become a supplement to NUREG-1793
- Presentation of chapters at ACRS meetings

Requests for Additional Information

- Presently about 47 RAIs pending
- Some RAIs amplify on open items (e.g., seven RAIs on HFE, nine on I&C, nine for chapter 9)
- Chapter 3 has ten, chapter 6 has seven, and there are five others

I&C Design Acceptance Criteria (DAC)

- Instrumentation and control
 - Diverse Actuation System (Table 2.5.1-4 commitment 4)
 - Design requirements
 - System Definition
 - hardware and software development
 - Protection and Monitoring System (Table 2.5.2-8 commitment 11)
 - Design requirements
 - System Definition
 - hardware and software development (design and implementation)

DAC – Human Factors Engineering

Table 3.2-1 of Tier 1

- Integration of Human Reliability Analysis with Human Factors Engineering design
- Task analysis (TA) performed IAW TA implementation plan
- Human systems interaction design for control room IAW implementation plan
- HFE program Validation and Verification plan developed IAW programmatic level description of HFE V&V plan

Piping DAC

- Table 1-2 in introduction to DCD contains list of analysis methods, Codes, modeling assumptions, and acceptance criteria for AP1000 piping and pipe support design
- Revision 17 proposes removal of DAC on basis of completion of risk-significant set of piping packages
- Staff review continuing

COL Information Items

- Table 1.8-2 of Tier 2 of the DCD contains all the COL information items.
- DCA added information about whether action needed by COL applicant or holder
- DCA proposes closure/deletion of 25 items, revision of 12 items, addition of 9 items
- Examples of COL items

Current DCA Review Schedule

- Published schedule had last chapter of SER w/OI issued in January
- Schedule for chapters 3 and 6 being re-evaluated due to additional submittals expected on shield building and sump

Open Item Status

- 124 Open items
- Attached table shows chapter breakdown
- Responses received for about one-third of items to date

Safety Evaluation Reports (SERs) with Open Items (OIs)

SERs w/Open Items by Chapter	OIs Open	OIs Closed
1	2	--
2	6	--
3	35	--
4	--	1
5	2	2
7	22	--
8	5	--
9	11	--
10	1	4
11	--	1
12	4	1
13	1	--
14	1	2
16	5	5
17	--	3
18	5	2
19	<u>2</u>	<u>4</u>
Total	102	25

Significant Design/Hardware Changes

- Seismic analyses (soils, high frequency)
- Structural changes for AIA (shield building and others)
- Enhancements for security, loss of large areas
- Containment Sump changes
- Control Room Ventilation System revision
- Integrated Head Package
- Pressurizer shape change
- Flow skirt and neutron panels added; RV diameter change, baskets moved
- Fuel storage racks – change in capacity, associated design changes
- Class 1E dc voltage now 250 V, second reserve aux transformer (and fast transfer), turbine and control system, additional waste monitor tanks

Changes in Materials

- Changes for ASME code of record, procurement
- Main steam line change to SA-335 Grade P11 alloy
- RCP flywheel change to bimetallic with tungsten alloy inserts. Alloy 625 for flywheel enclosure
- RV change to copper limit
- Add additional SS types for RV internals (304,304H,304L)
- CRDM components materials

Fuel and core design changes

- Gray rod control assemblies (from 4 to 12 with Ag-In-Cd)
- Use of borosilicate or wet annular burnable absorbers
- Changes to internals affect on method for determining total design bypass flow

Committee Interactions

- Orientation briefings in October 2007 and May 2009
- SC meeting July 23-24, 2009 (10 chapters)
- Subcommittee meeting Oct 6-7, 2009 (3 chapters)
- SC meeting Nov 19-20, 2009 (2 chapters and info brief on sump testing)
- January 13-14, 2010 SC briefing scheduled (chapter 15, other topics of interest)

Status for AP1000 Reference Combined License Application

DNRL

November 5, 2009

AP1000 Lead COL Status

- Transition from Bellefonte to Vogtle as the AP1000 reference COL is nearly complete:
 - Staff issued Bellefonte SER with Open Items for Chapters 1, 2, 3 (except 3.7/3.8), 4, 5, 7, 8, 10, 11, 12, 13 (except 13.6/13.7), 14, 16, 17, 18, 19
 - Bellefonte SER with Open Items Chapters 6, 9, and 15 will be issued on a schedule that comports with AP1000 DCD SER with Open Items schedule
- Staff preparing Vogtle's Advanced Final Safety Evaluation Report with no Open Items (Advanced FSER).
 - The current schedule for completion of the Advanced FSER is late summer/early fall 2010.
 - ACRS interactions on the Advanced FSER in fall 2010.

Proposal for upcoming ACRS Interactions

November 2009 to February 2010

- Interact with ACRS staff to identify “issues of interest” to ACRS subcommittee members
 - Related to standard content
 - Related to site-specific content

Spring and Summer 2010

- Conduct ACRS subcommittee informational briefings on “issues of interest”

Fall 2010

- Conduct ACRS subcommittee and full committee briefings on Vogtle and Summer Advanced FSERs



Regulatory Guide RG 5.71 Cyber Security Programs for Nuclear Facilities

Presented to: Advisory Committee on Reactor Safeguards

Karl Sturzebecher & Eric Lee
US Nuclear Regulatory Commission
November 5, 2009

Purpose of the Meeting

- Review enhancements to RG 5.71
- Overview of RG 5.71
- Request letter with feedback

Enhancements

- New framework
- Deterministic methodology using NIST standards
- Provided self tailoring full spectrum security controls
- Detailed guidance & examples to meet the rule
- Addresses the differences between DI&C and IT systems
- Defensive architecture
- Security lifecycle enhancements
- Security Plan Template - Submittal

Cyber Security Program

- Form a Cyber Security Team (CST)
- Identify Critical Systems (CS's) and Critical Digital Assets (CDAs)
- Defense-in-Depth Protective Strategies

Defense-in-Depth Protective Strategies

Strategy 1 - Incorporate protective security boundaries for timely detection and response against a cyber attack

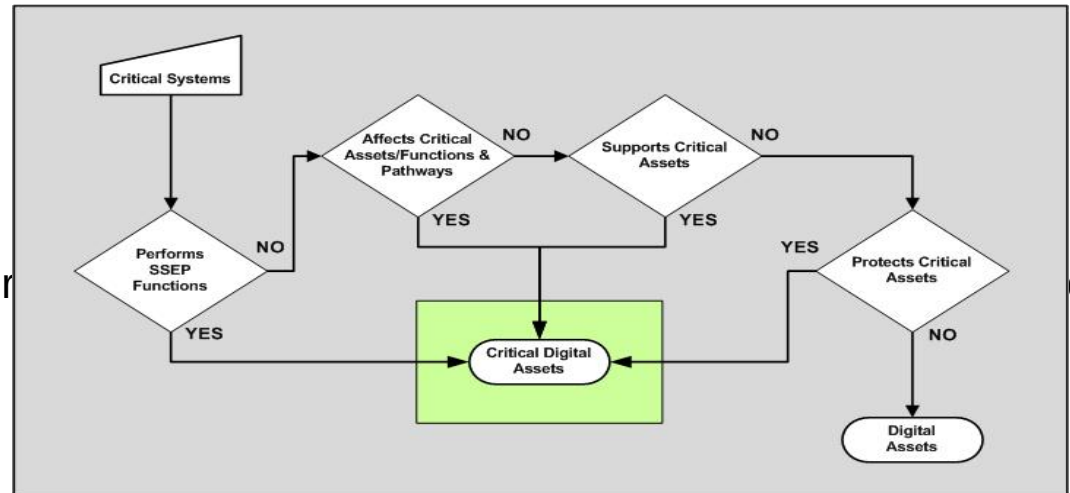
Strategy 2 - The application of security controls coupled with the physical program to detect, deter, respond and recover from a cyber attack

Strategy 3 - Maintain the Cyber Security Program, which includes improving the program

Application of Strategy 1&2

The Steps:

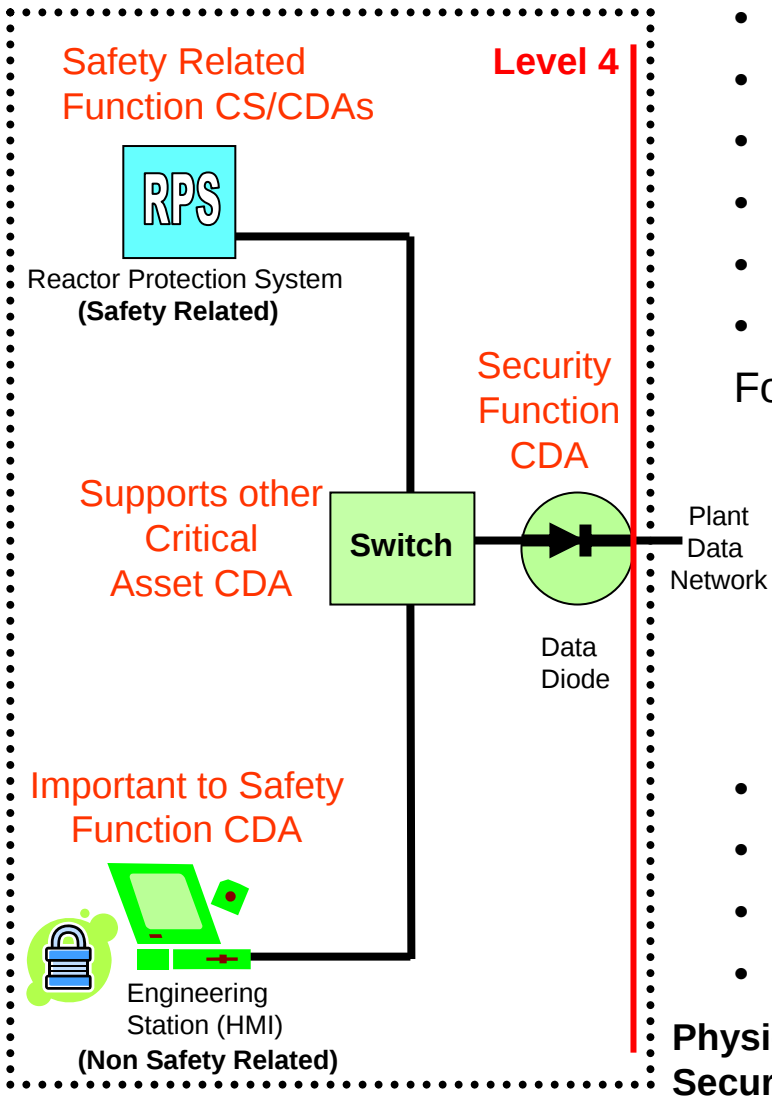
- Determine CSs and CDAs
- Review and validate



however alternately applied at the HMI along with Physical Security

C: Authentication is applicable, do A or B

- Complete addressing for all security controls per CDA
- Test for vulnerabilities and ensure effectiveness
- Complete sufficient documentation for NRC inspection
- Maintain the Cyber Security Program



Maintaining the Cyber Security Program

- Actively monitor and update cyber security
- Change control
- Review as part of the physical security program
- Retain records and documents

Cyber Security Plan Template

- Describe Cyber Security Team qualifications
- Describe how CDAs are identified
- Describe the defensive architecture
- Describe how all cyber security controls in RG 5.71 Appendices B&C are addressed and applied
- Document commitment to have sufficient documentation available for review upon inspection
- Describe how cyber security program will be maintained

Summary of RG 5.71

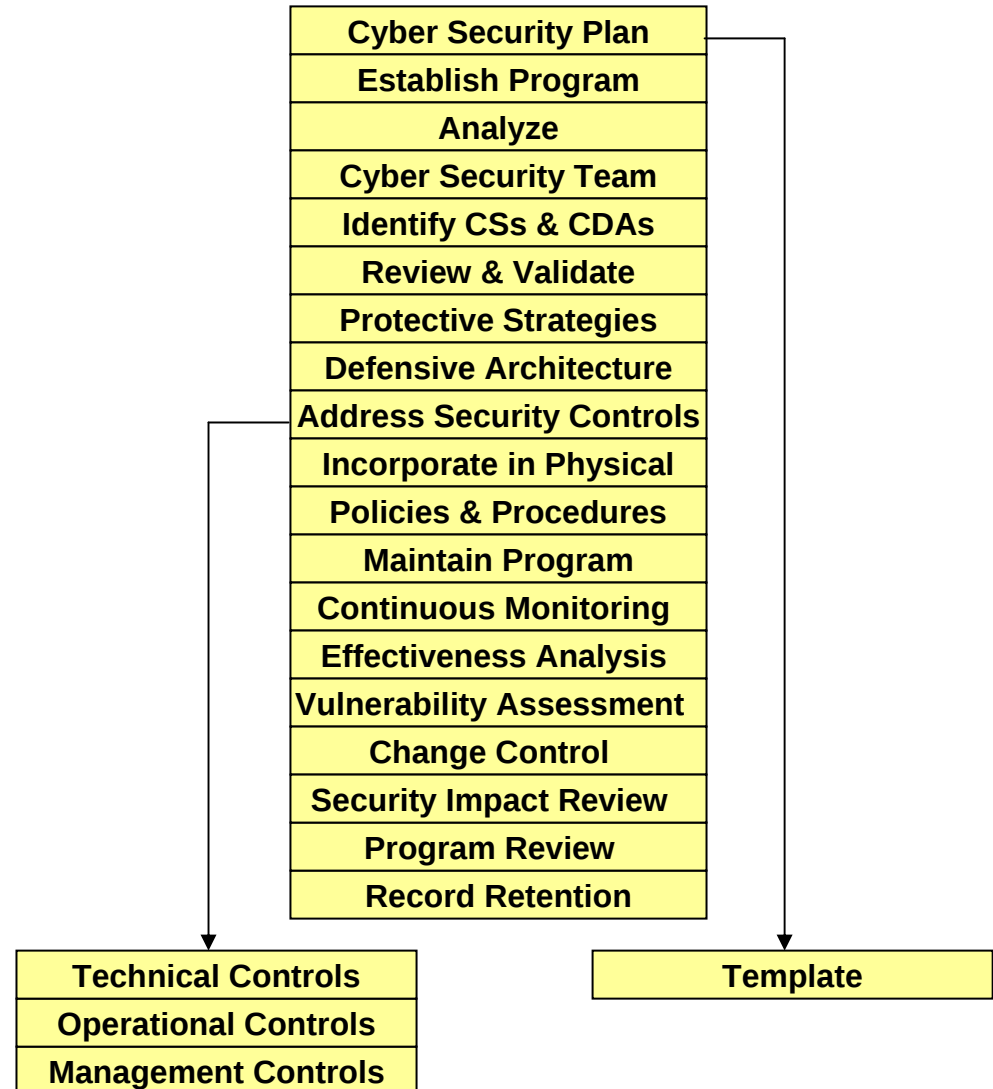
- Addresses an intelligent, malicious adversary
- Based on experience and expertise for defending similar or greater threats
- Peer reviewed on widely accepted standards

Enhancements Backup #1

March 2009 Version

Cyber Security Plan
Cyber Security Program
Analyze
Incorporate in Physical
Attack Vectors
Apply Security Controls
Protective Strategies
Policies & Procedures
Roles & Responsibilities
Review Program
Record Retention

November 2009 Version



March 2009 Version

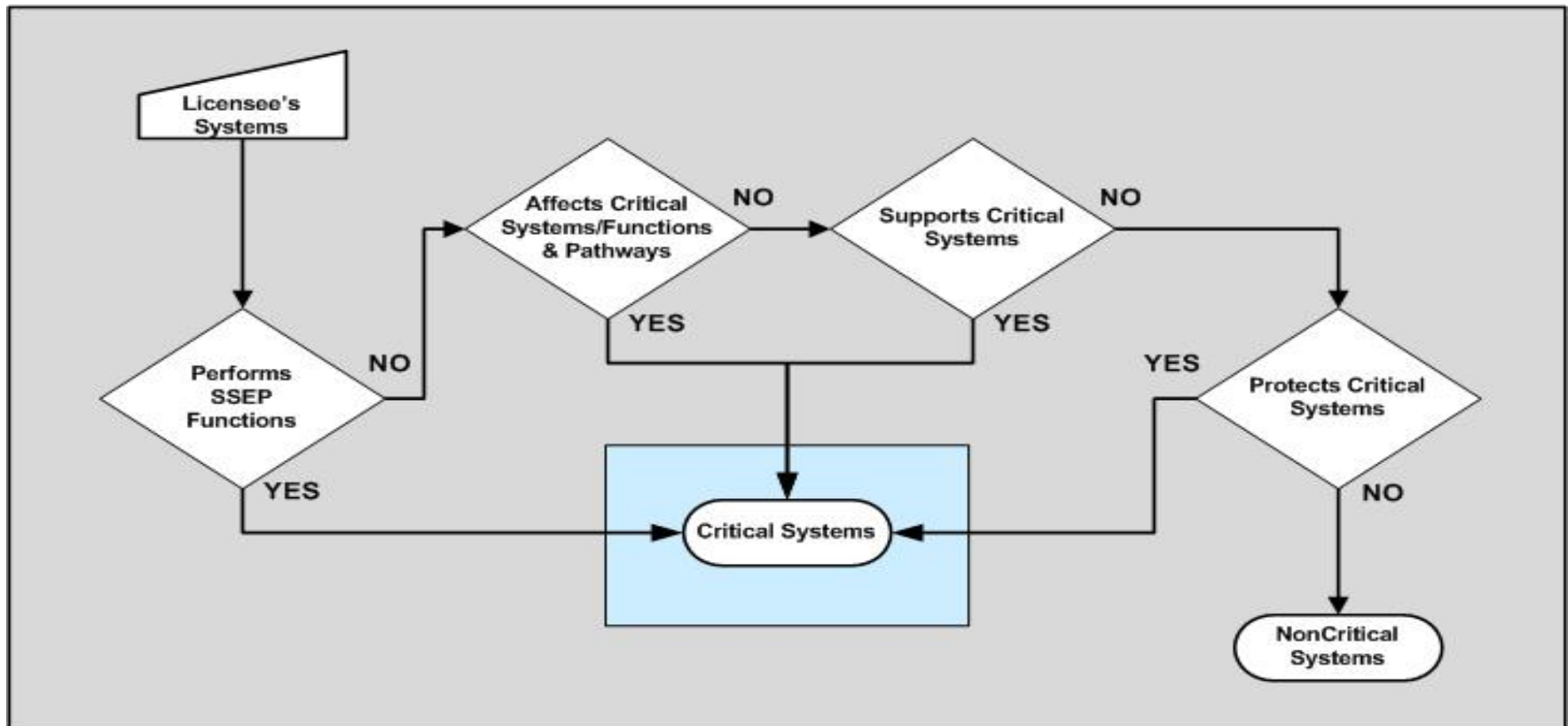
- Risk based methodology
- Use attack vector analysis to prove need
- Apply security controls
- Bottom up approach

November 2009 Version

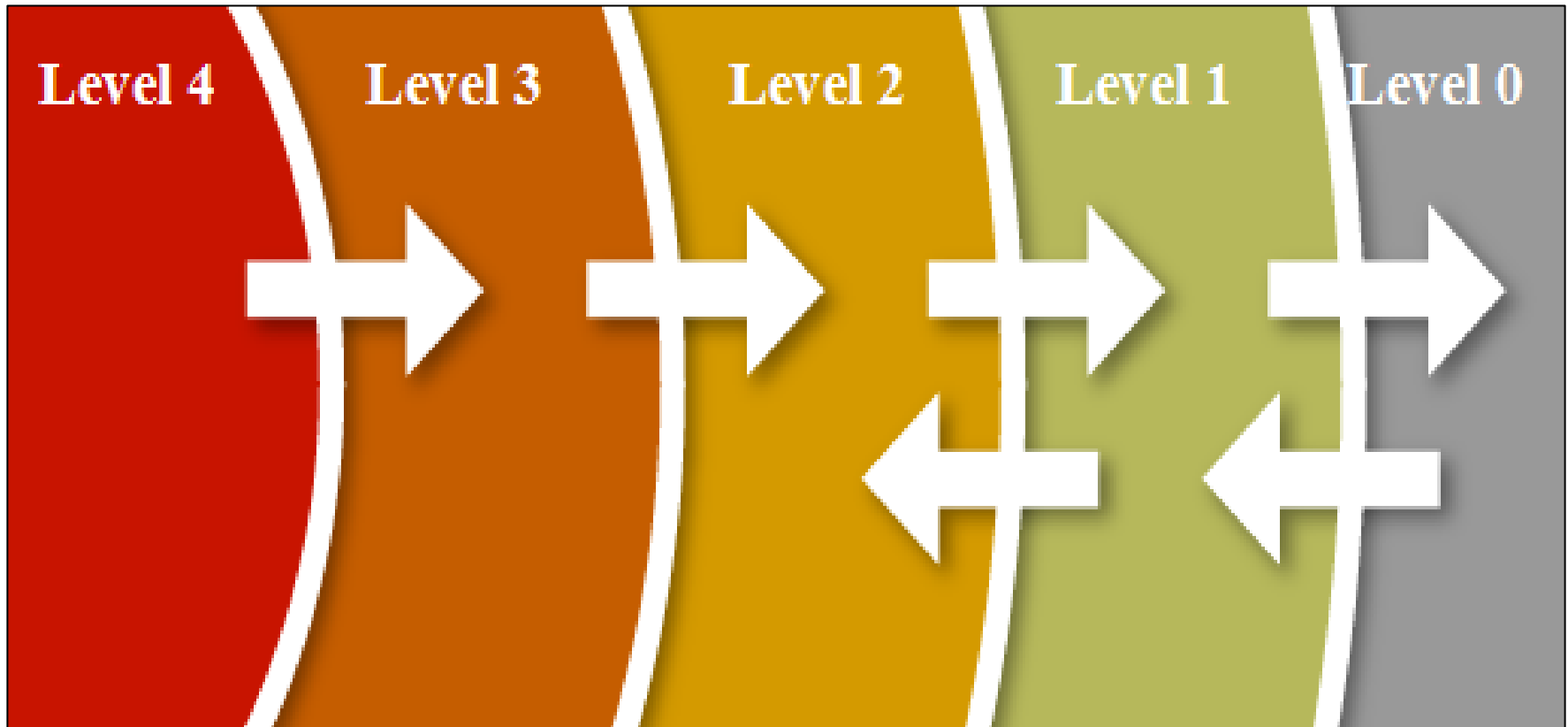
- Deterministic methodology using NIST security controls
- Self tailoring technical security controls
- Vulnerability assessment & effectiveness analysis confirm protection
- Top down approach

Flow Chart Backup #3

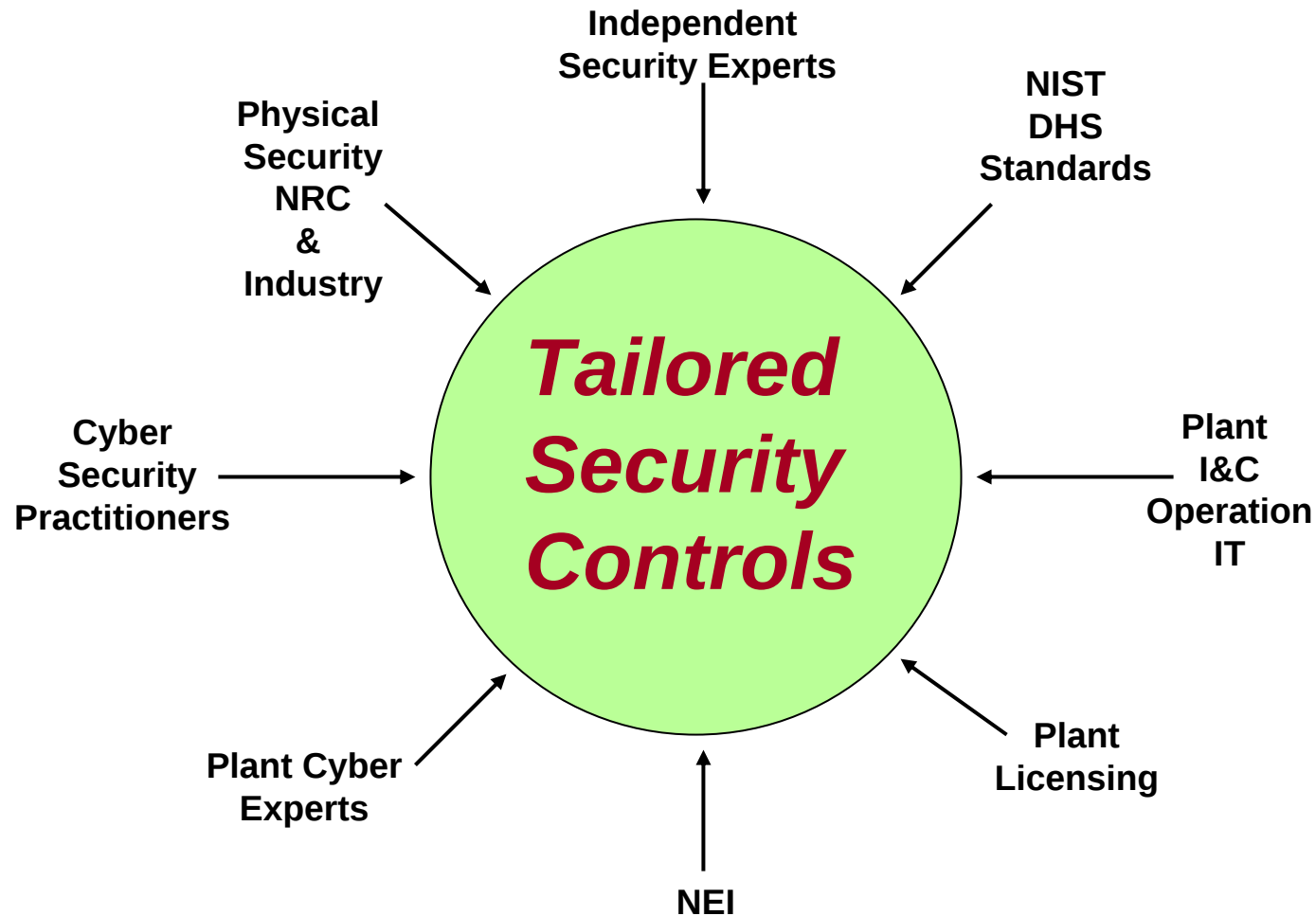
Identify Critical Systems (CSs) & Critical Digital Assets (CDAs)



Deploy Defensive Architecture



Strategy 2 - Backup #5



The three ways to address technical security controls

A: Apply security control to CDA

B: If security control can not be implemented then use alternative controls or countermeasures with same degree of protection

C: If the security issue does not exist, then the security control is not applicable

References:

NIST SP 800-53, Rev. 3, "Recommended Security Controls for Federal Information Systems," National Institute of Standards and Technology, Gaithersburg, MD, August 2009.

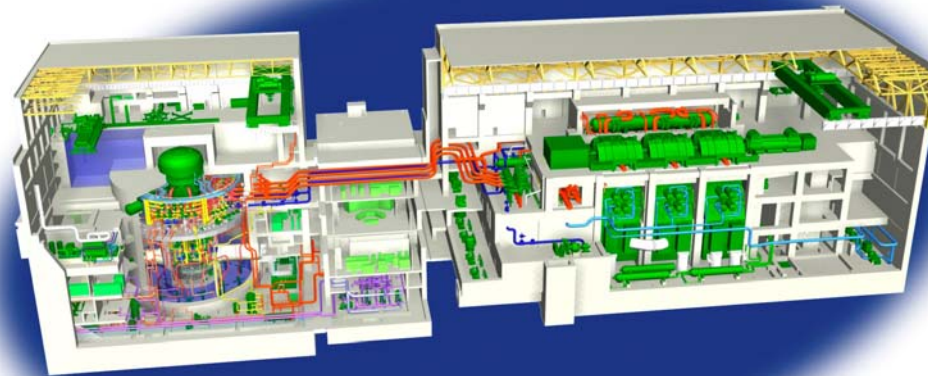
NIST SP 800-30, "Risk Management Guide for IT Systems," National Institute of Standards and Technology, Gaithersburg, MD,

NIST SP 800-37, "Guide to Certification and Accreditation of Federal Information Systems," National Institute of Standards and Technology, Gaithersburg, MD, May 2004.

NIST SP 800-82, "Guide to Industrial Control Systems Security," National Institute of Standards and Technology, Gaithersburg, MD, September 29, 2008.

DHS, "Catalog of control systems Security: Recommendations for Standards Developers," Department of Homeland Security, Washington, DC, September 2008.

Advisory Committee on Reactor Safeguards



Overview Advanced Boiling Water Reactor (ABWR) South Texas Project (STP) Units 3 & 4

November 5, 2009
(Open/Closed)

Introductions

Attendees

STPNOC

Mark McBurnett

Scott Head

Bill Stillwell

Jim Tomkins

Coley Chappell

Mike Murray

Kyle Dittman

TANE

Hiroshi Sakamoto

Fumihiko Ishibashi

Bob Schrauder

Toshiba

Hirohide Oikawa

Westinghouse

Bob Quinn

Brad Maurer

Nirmal Jain

Sargent & Lundy

Bob Hooks

MPR

Caroline Schlaseman

Desired Outcome

Provide an overview to ACRS on the background of the certified U.S. Advanced Boiling Water Reactor (ABWR) to be provided by Toshiba for South Texas Project Units 3 and 4

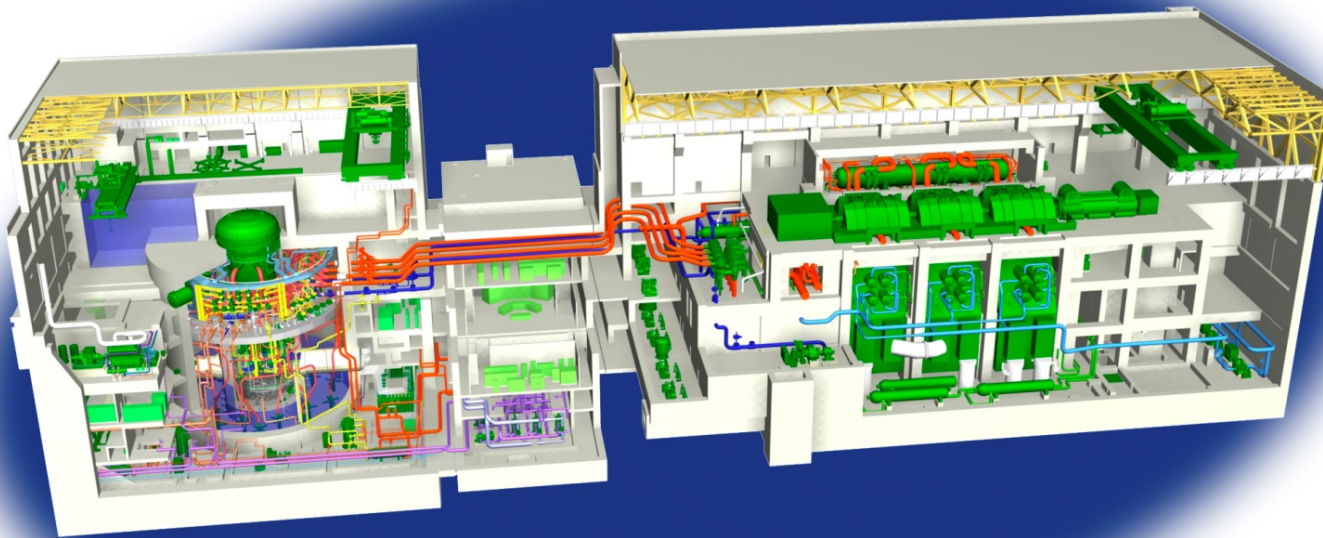
Agenda

- Introduction – Mark McBurnett
- ABWR Overview – Hiroshi Sakamoto
- ABWR Technology & Comparison to BWR – Hiroshi Sakamoto
- Aircraft Impact (CLOSED) – Bob Quinn
- History of STP Units 3 & 4 COL Application – Mark McBurnett
- Departures from the ABWR DCD – Mark McBurnett
- Fuel Design and Licensing – Bob Quinn
- Conclusion

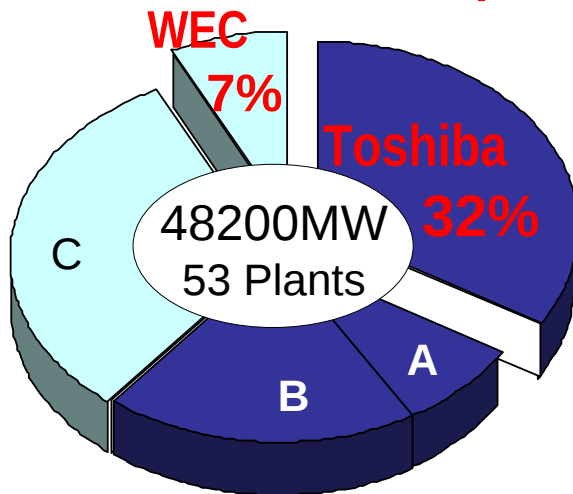
Engineering, Procurement, and Construction (EPC) Team

- **Prime Contractor:**
Toshiba through Toshiba America Nuclear Energy
- **Sub Contractors:**
 - **Fluor**
 - **Sargent & Lundy**
 - **Westinghouse**
 - **MPR**

Overview Advanced Boiling Water Reactor (ABWR)

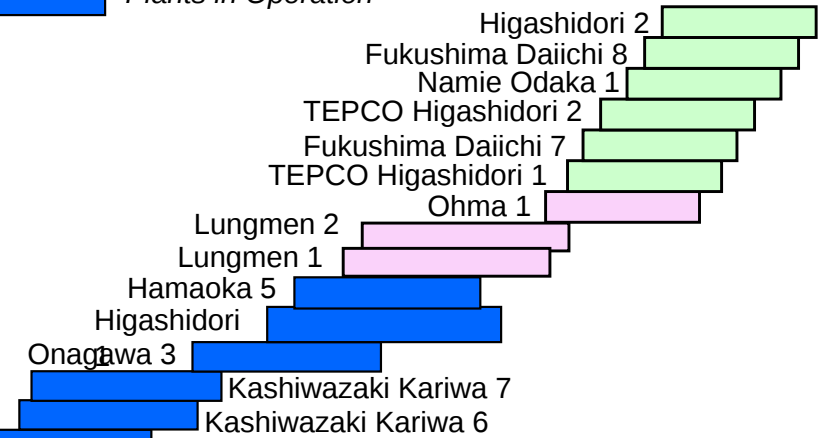


Toshiba Group: 39%

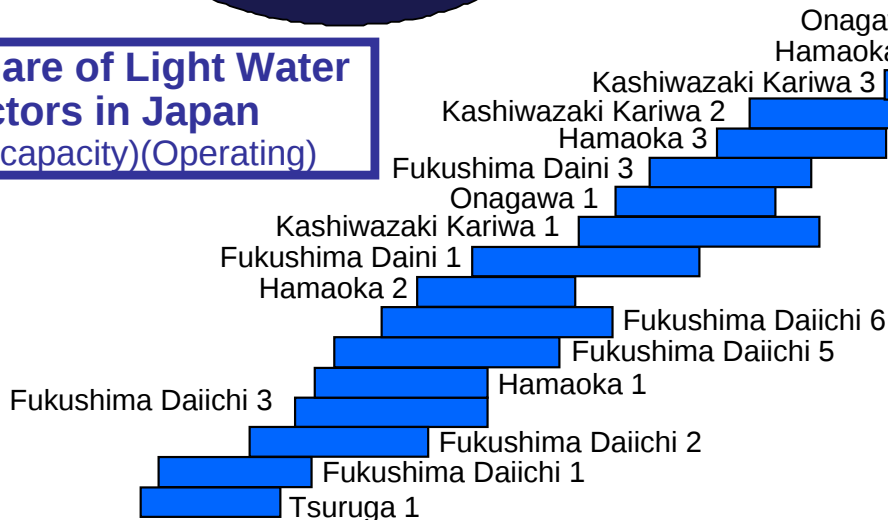


PWR
40%
(23 Plants)

BWR
60%
(32-2 Plants)



Market Share of Light Water Reactors in Japan
(installed capacity)(Operating)



- Entered business in 1966
- Constructed 22 plants, 17 as prime contractor
- Acquired WEC in 2006

Continuous Construction Experience

ABWR Progression



STP 3,4



Hamaoka 5



Shika 2



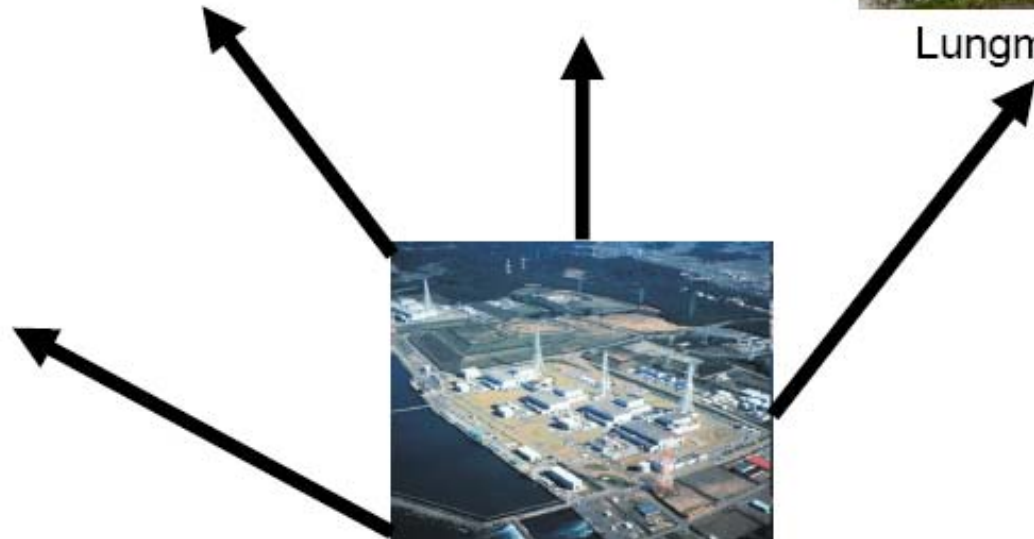
Lungmen 1,2



US ABWR
DCD

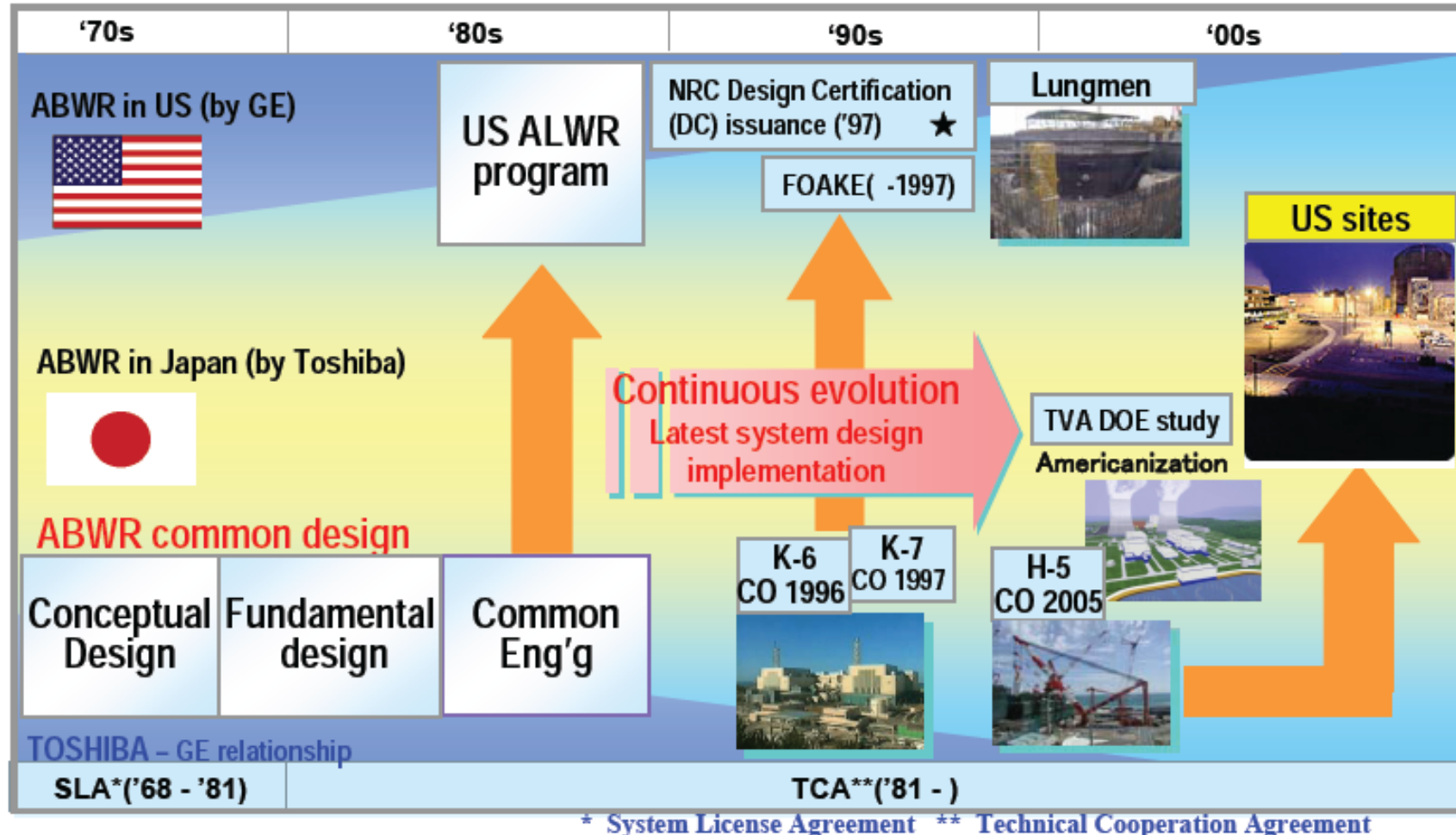


Kashiwazaki 6,7



{

ABWR was Jointly Developed in Japan

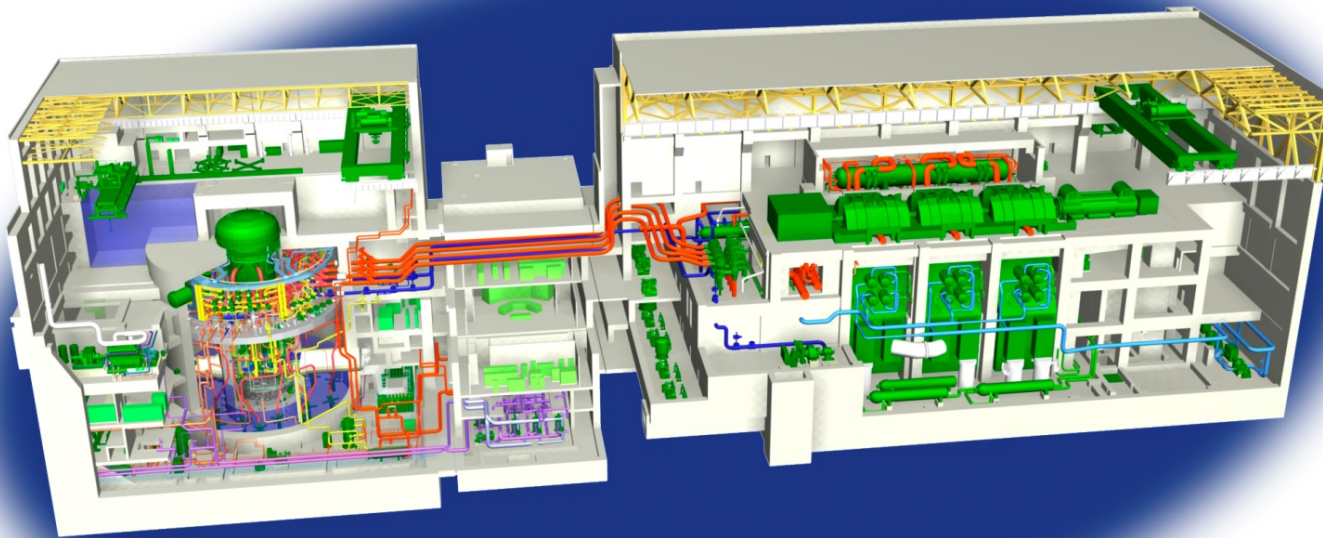


Toshiba ABWR Experience

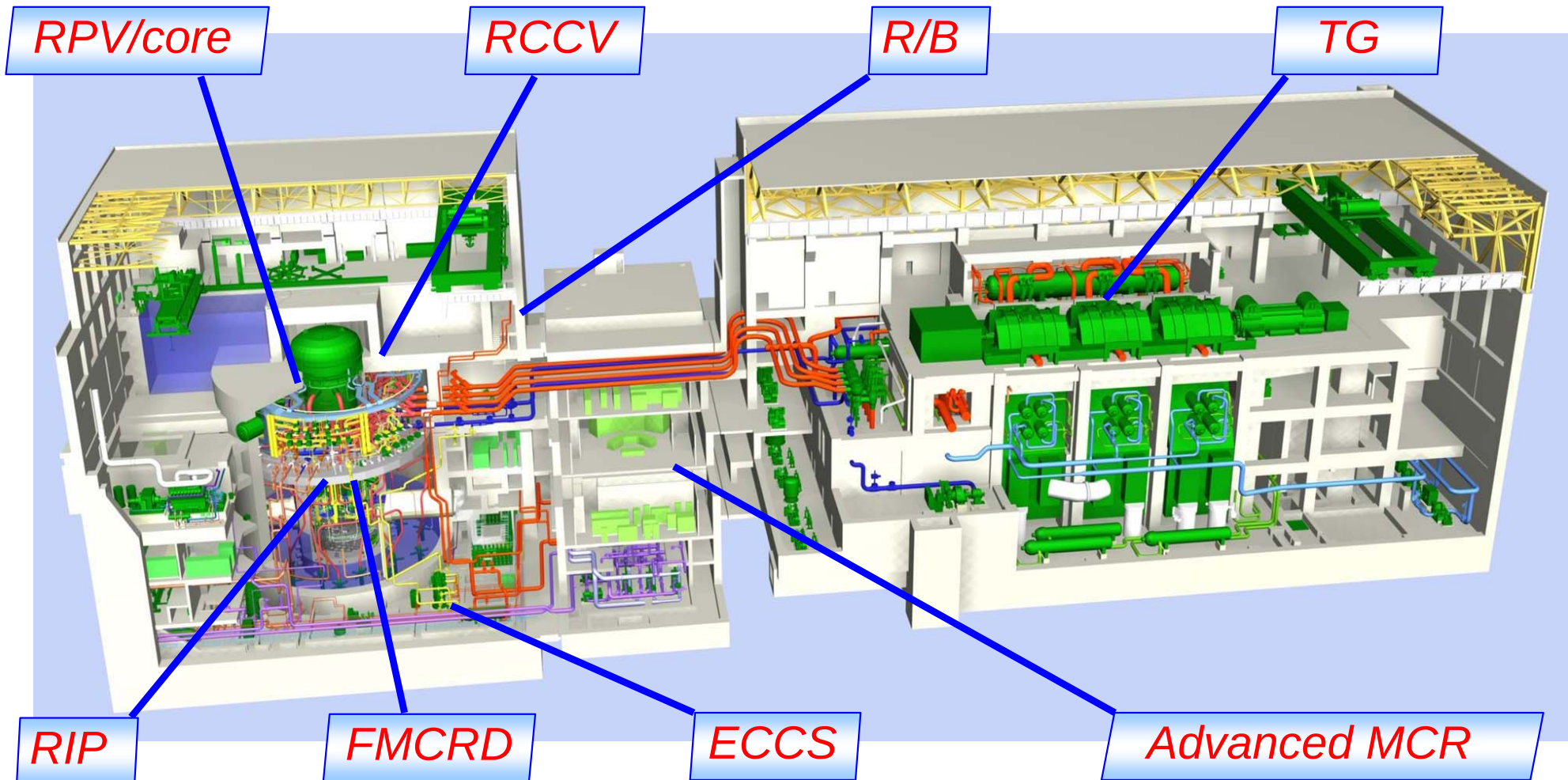
Development of the ABWR Design:

- **ABWR was developed in Japan, under the cooperation of Toshiba, Hitachi, and GE and was supported by TEPCO and other utilities**
- **Toshiba has a complete set of ABWR design documents through the development of the above and actual construction in Japan**

ABWR to BWR Comparisons



Overview of ABWR

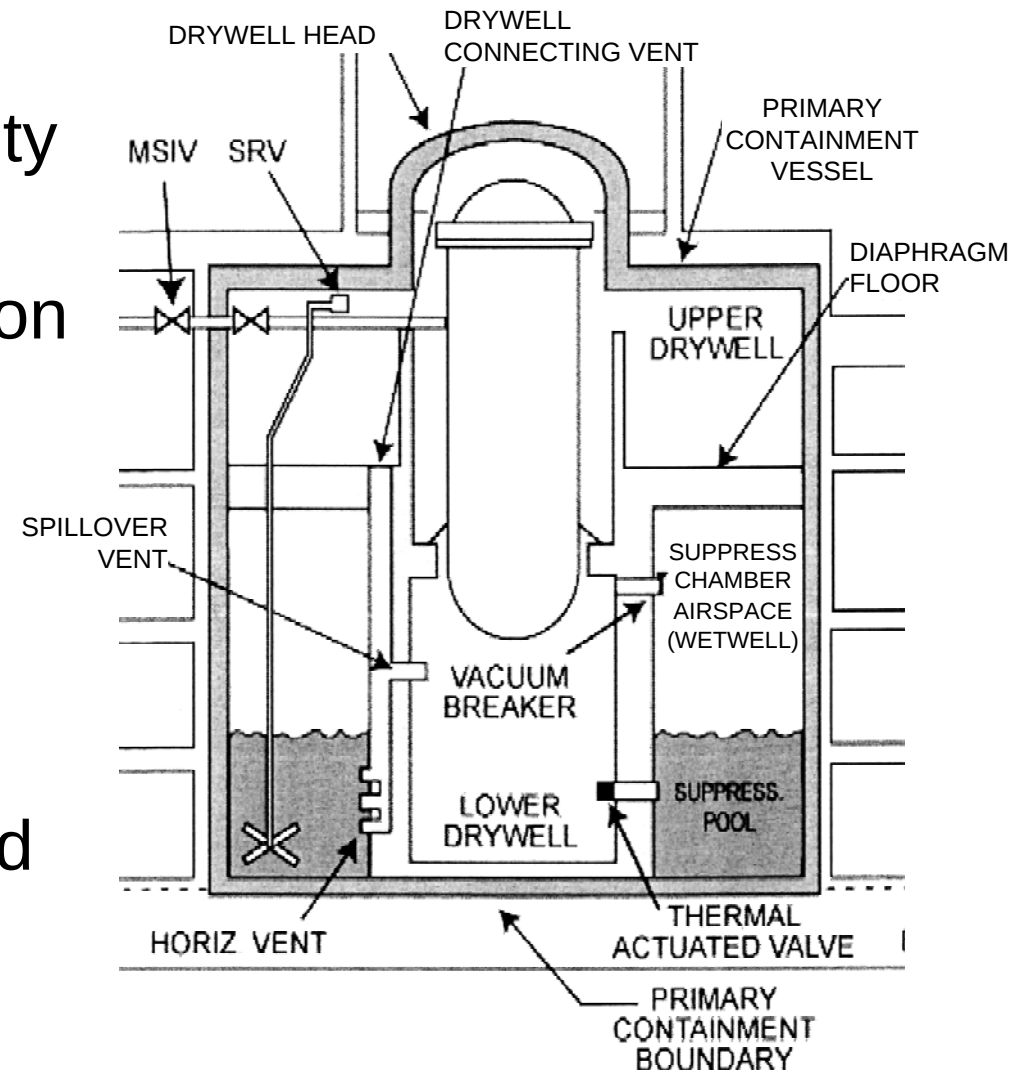


	ABWR	BWR
Recirc Flow	10 Internal recirc pumps (RIPs)	2 External recirc loops – Variable recirc pumps – Flow control valves
Control Rod Drive	Fine motion control rod drives – Group or “gang” control capability – Electrical fine motion drive, hydraulically scrambled	Hydraulically operated control rods with single rod operation
LOCA Design	RPV water level post-blowdown <u>above</u> top of active fuel (TAF)	RPV water level post-blowdown 2/3 core height with spray cooling

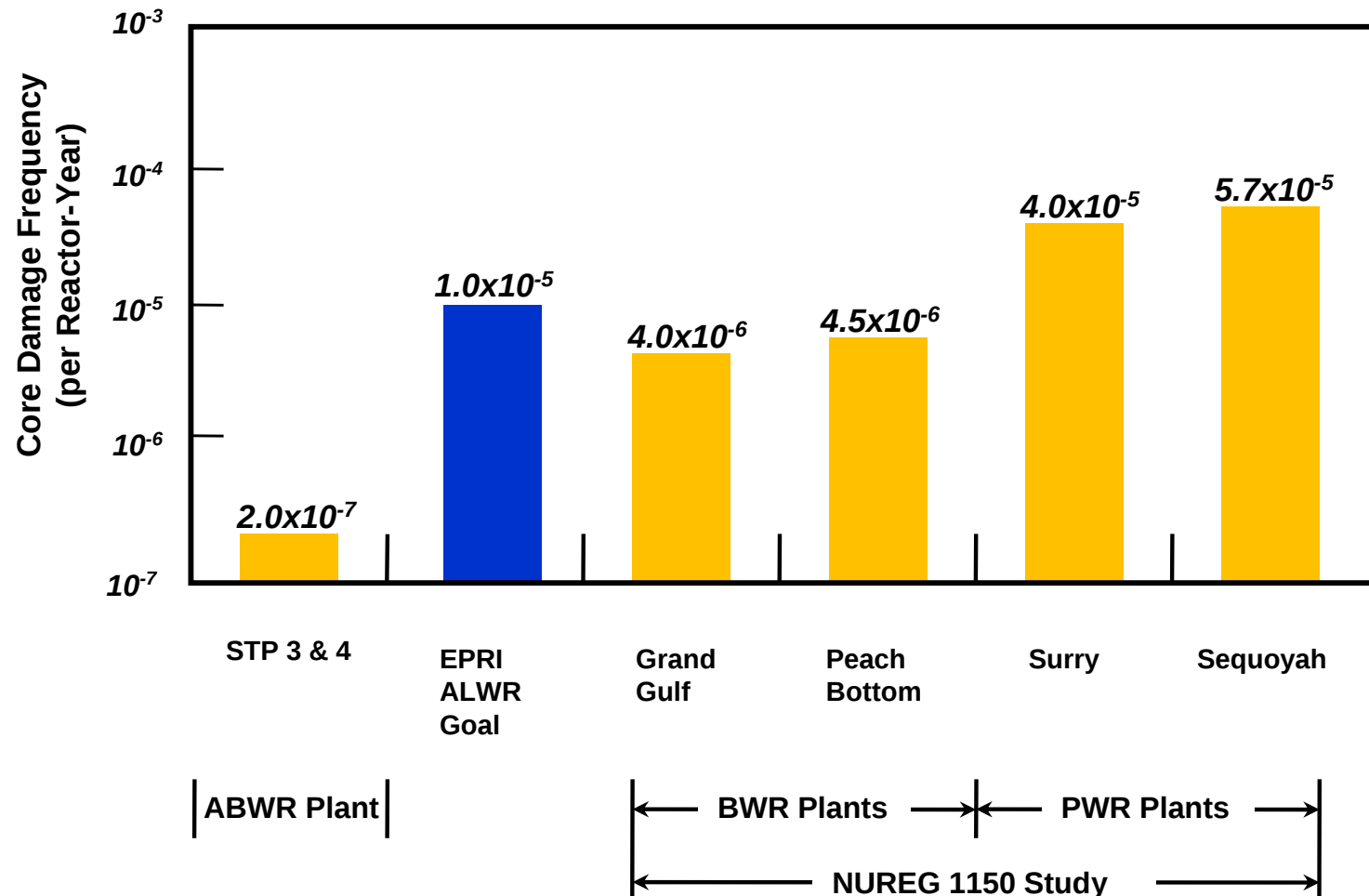
	ABWR	BWR
ECCS	3 divisions high pressure + 3 divisions low pressure flooding	1 division high pressure + 2 divisions core spray and low pressure flooding
ATWS Mitigation Features	Advanced design: – Alternate Rod Insertion (ARI) – Recirc Pump Trip (RPT) – Auto Standby Liquid Control (SLCS) initiation – Fine Motion Control Rod Drive auto run-in – Auto feedwater pump runback	10 CFR 50.62 required RPT, ARI and SLCS

ABWR Severe Accident Mitigation Features

- Inerted containment
- Lower drywell flood capability
- Lower drywell special concrete and sump protection
- Suppression pool - fission products scrubbing and retention
- Containment overpressure protection (COPS)
- Drywell sumps corium shield
- AC Independent Water Addition (ACIWA)



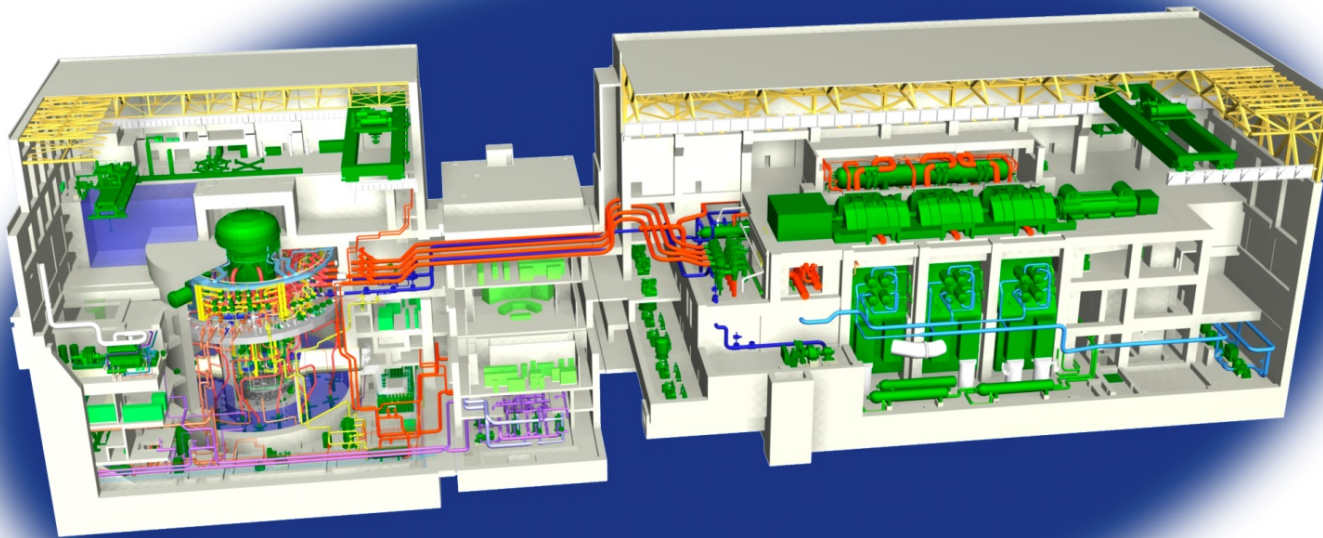
Core Damage Frequency - Internal Events



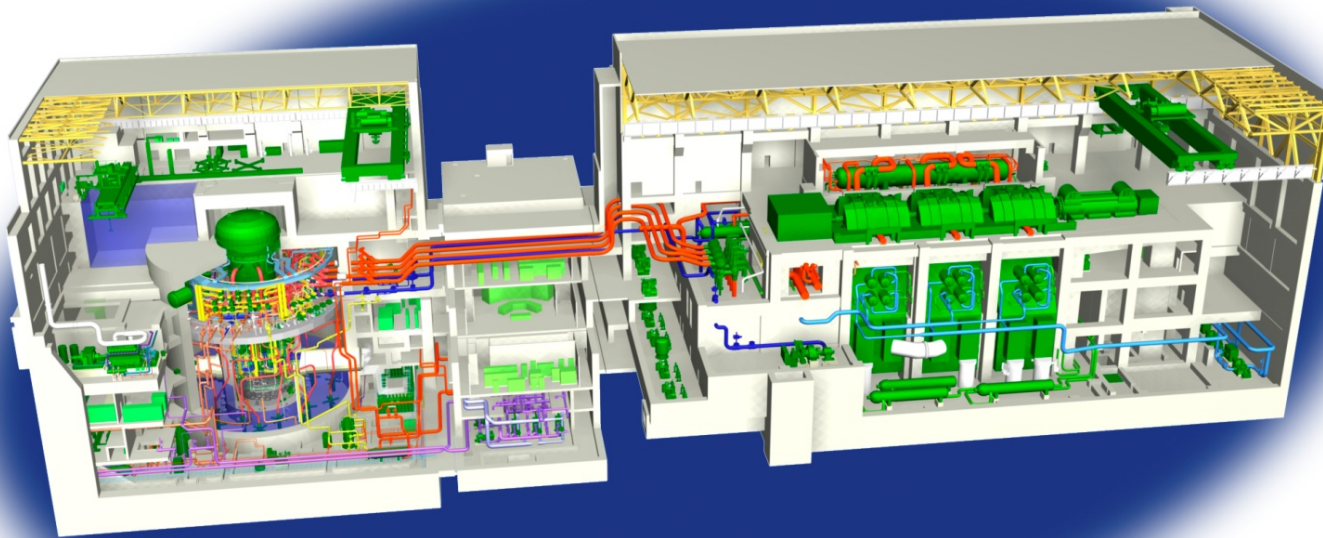
Advanced Control Room



Aircraft Impact Assessment (Closed)



History of STP Units 3 and 4 COLA



Site Characteristics



- Large site – 12,200 acres
- Large Main Cooling Reservoir – 7,000 acres sized for 4 units
- Infrastructure in place
 - Road, rail and barge access
 - Transmission corridor
- Low population density nearby
- Existing State, County and Site Emergency Plans
- Strong community support

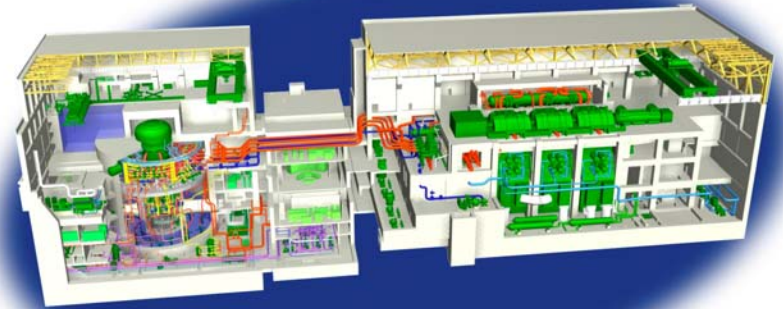
Technology Selection

ABWR is proven reactor technology

- Design Certification issued
- Four Units in Operation

Objectives

- Least licensing risk
- Predictable construction schedule
- Generation online as soon as possible
- Take advantage of advanced state of ABWR design and engineering
- Maximize use of existing plant design
- Minimize departures from Certified Design



Alternate Vendor Capabilities

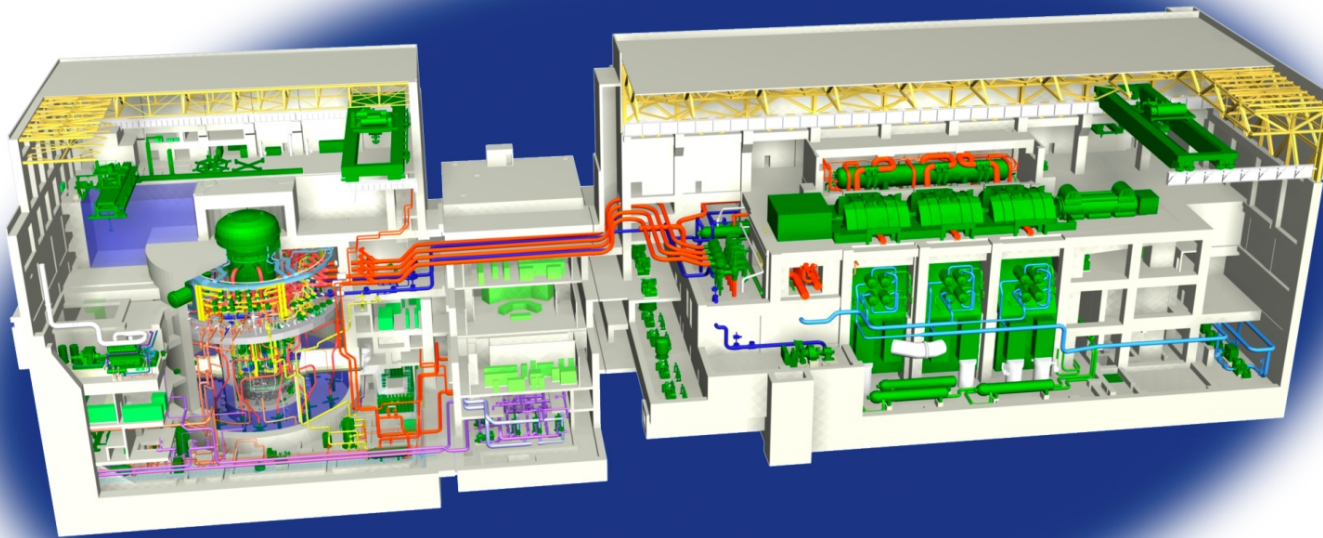
STP Due Diligence review was performed:

- Objectives
 - Toshiba Capability Assessment Oversight
 - Independent Assessment
- Conclusions
 - STP Concluded Toshiba is qualified to supply the U.S. ABWR
 - Confidence in the ability of the EPC Team to build the Certified ABWR Design and support the STP COLA
 - Project risks and impacts have been addressed and found acceptable

History of the STP Units 3 and 4 COLA

- 09/20/07 COLA submitted referencing 10 CFR 52, Appendix A, ABWR Design Certification
- 11/29/07 NRC accepted COLA for docketing (52-012 and 52-013)
- 08/18/08 STP letter to NRC regarding Due Diligence Report finding Toshiba is qualified as Alternate Vendor
- 09/24/08 COLA Revision 2 submitted to NRC
- 08/28/09 NRC completed independent assessment that finds Toshiba qualified as Alternate Vendor
- 09/16/09 COLA Revision 3 submitted to NRC
- 09/17/09 NRC completed COLA Safety Review Phase I (RAIs Issued)

Departures from the ABWR DCD Tier 1, Tier 2*, Technical Specifications, and Notable Tier 2



Departures from the ABWR Design Control Document (DCD)

- STP 3 & 4 is basically identical to the U.S. ABWR Certified Design
- Limited number of Tier 1 Departures (13)
- One Tier 2* Departure

Tier 1 Departures

New Technology

- Safety-Related I&C Architecture
- RCIC Turbine/Pump

Site Specific

Corrections

- Site Parameters
- Feedwater Line Break Mitigation
- Reactor Building Safety-Related DG HVAC

Enhancements

- I&C Power Divisions (4th Division I&C)
- RHR System and Spent Fuel Pool Cooling
- Hydrogen Recombiner Elimination
- Delete High Radiation MSIV Closure and Scram

Miscellaneous

- RPV System RIP Motor Casing Cladding
- Re-classification of RW Bldg to Non-Seismic
- Control Systems Inputs, Tests, and Hardware
- Breaker/Fuse Coordination and Low Voltage Testing

Tier 1 Departures

New Technology

- Safety-Related I&C Architecture (STD DEP T1 3.4-1)
 - Separate and independent system level data communication capabilities replace obsolete technology
 - Functional (vs. hardware) design of digital controls platforms
 - Eliminated unnecessary redundant actuation logic
- RCIC Turbine/Pump (STD DEP T1 2.4-3)
 - Simplified monoblock design (integral turbine and pump)
 - Installed and operating in international applications

Tier 1 Departures

Site Specific

- Site Parameters (STP DEP T1 5.0-1)
 - STP 3 & 4 site requires departures from the reference ABWR DCD site parameters selected to bound most potential U.S. sites:
 - Minimum shear wave velocity
 - Design basis flood level (increased ~7 feet) due to main cooling reservoir failure as a design basis event
 - Maximum design precipitation rate (rainfall) and maximum wet-bulb temperatures (humidity)

Tier 1 Departures

Corrections

- Feedwater Line Break Mitigation (STD DEP T1 2.4-2)
 - Safety-related trip of condensate pumps after Feedwater Line Break (FWLB) in containment, to limit mass flow
 - Related Tier 2 Departures requiring NRC approval:
 - Containment Analysis** (STD DEP 6.2-2) updates modeling using GOTHIC (WCAP-17058), for feedwater flow into the drywell (FWLB), drywell connecting vents, and decay heat curves (non-conservative for long-term analysis)
 - Revised Pool Swell Analysis** (STD DEP 3B-2) incorporates new pool swell method to address containment response as described in STD DEP 6.2-2

Tier 1 Departures

Corrections

- Reactor Building Safety-Related Diesel Generator HVAC (STD DEP T1 2.15-2)
 - Diesel Generator (DG) engine room temperature limit during operation is below 60°C vice 50°C
 - No impact to environment for DG controls

Enhancements

- I&C Power Divisions (STD DEP T1 2.12-2)
 - Adds 4th safety-related division to Class 1E I&C Power Supply System

Tier 1 Departures

Enhancements

- RHR System and Spent Fuel Pool Cooling
(STD DEP T1 2.4-1)
 - Adds RHR A capability so that any of the three RHR loops can supply fuel pool cooling or makeup
 - Increases flexibility to coordinate division outages
- H2 Recombiner Requirements Elimination
(STD DEP T1 2.14-1)
 - Complies with 10 CFR 50.44, amended after Certification
- Deletion of MSIV Closure and Scram on High Radiation
(STD DEP T1 2.3-1)
 - Existing regulatory and BWR industry initiative to eliminate spurious trips

Tier 1 Departures

Miscellaneous

- RPV System Reactor Internal Pump (RIP) Motor Casing Cladding (STD DEP T1 2.1-2)
 - Consistent with design in use for operating ABWRs
- Re-classification of Radwaste Building Substructure to Non-Seismic (STD DEP T1 2.15-1)
 - Commits to Regulatory Guide 1.143 rev. 2 for the design of radwaste processing SSCs
- Control Systems Changes to Inputs, Tests, and Hardware (STD DEP T1 2.2-1)
 - Test clarification for Rod Control and Information System (RCIS) non-Class 1E uninterruptible power supplies, such that either will maintain both RCIS channels operational

Tier 1 Departures

Miscellaneous

- Breaker/Fuse Coordination and Low Voltage Testing (STD DEP T1 2.12-1)
 - Modifies interruption device coordination to conform with acceptable industry practices, and codes and standards (e.g., IEEE 141, IEEE 242, etc.), and to coordinate to the maximum extent possible
 - Allows for as-built performance type voltage testing and analyses at the manufacturer's shop, and comparison of pre-operational tests against system voltage analyses

Tier 2* Departure

Tier 2* Departure

- Codes, Standards, and Regulatory Guide Edition Changes (STD DEP 1.8-1)
 - Updates compliance to more current revisions/editions of selected applicable NRC Regulatory Guides and Industry Codes and Standards which have been approved or endorsed by the NRC
 - Ensures more recent industry design and construction practices are used, updates requirements in fields that have advanced considerably since certification, and deletes obsolete requirements

Departures from the Generic Technical Specifications

- Tier 2 design changes that require conforming changes (9)
Examples:
 - **Containment Analysis** (STD DEP 6.2-2) as previously noted
 - **Plant Medium Voltage Electrical System** (STD DEP 8.3-1) changes to a dual voltage (13.8 kV and 4.16 kV) design, increases DG and Combustion Turbine Generator (CTG) ratings, and revises CTG required start time to comply with RG 1.155 for Station Blackout (SBO) alternate AC
- Other changes to the Tech Specs (7)
- Editorial changes that do not change intent

Tier 2 Departures

- Except as previously noted, changes to Tier 2 information do not require an exemption or prior NRC approval
 - Screened/evaluated according to Part 52 App A, VIII.B.5
 - Changes are site-specific (e.g., Turbine Generator design), regulatory-related (e.g., dual units), corrections, updates, and clarifications
- Radwaste changes are considered notable for their scope:
 - **Liquid Radwaste Process Equipment** (STD DEP 11.2-1)
 - Modular components and reduced system complexity, no fundamentally new equipment or processes
 - Removes Concentrators (Evaporators), and changes number/capacities of installed tanks and pumps

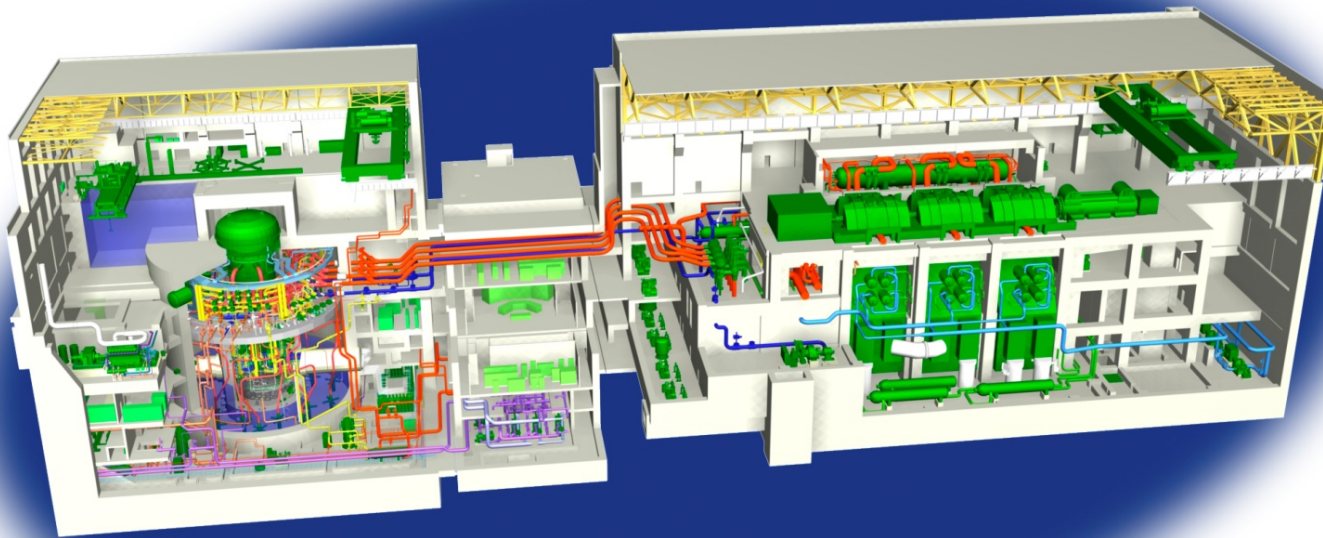
Tier 2 Departures

- **Gaseous Waste Management System** (STD DEP 11.3-1)
 - Recombiner train with proven operational experience
 - Changes number, arrangement and vessel size of charcoal adsorbers (total mass unchanged)
 - Adds offgas evacuation system and revises charcoal adsorber vault temperature to optimize performance with no changes to design basis or function
- **Radioactive Solid Waste Update** (STD DEP 11.4-1)
 - Modular components and reduced system complexity, no fundamentally new equipment or processes
 - Deletes Incinerator and Compactor, and changes number/capacities of tanks and pumps

Tier 2 Departures

- **ECCS Suction Strainers** (STD DEP 6C-1)
 - Upgrades strainers to state-of-the-art cassette type
 - Meets latest regulatory guidance in RG 1.82 Rev. 3

Fuel Design and Licensing



Fuel Background and Overview

- STP 3&4 COLA does not depart from the certified fuel design
- COL amendment to be submitted ~ 2 years prior to fuel load

STP 3&4 Fuel Status and Schedule

- Westinghouse Licensing Topical Reports (LTRs) are being submitted to expand the safety analysis methodology to ABWR design
 - 2 new LTRs (transient and stability analyses)
 - 1 revision (reload methodology)
 - 8 supplements (transient, LOCA, containment, and control rod blades)
- Schedule of LTR submittals
 - 2 completed in September and October 2009
 - 1 planned for April 2010, 4 in June 2010, and 4 in September 2010
- LTR submittal schedule and expected NRC review supports STP 3&4 fuel amendment submittal in 2013

Conclusion



ACRS Briefing On South Texas Project Licensing Activities

*Mark Tonacci, Branch Chief
George Wunder, Lead Project Manager
ESBWR/ABWR Projects Branch 2 (NGE2)*

November 5, 2009

South Texas Project 3 and 4 Licensing Activities

	COL Safety Review	DC Air Craft Impact Assessment	COLA Limited Work Authorization	Fuel Topical Reports	COL License Amendm't
Receipt Date	09/20/07 - A	6/30/09 - A	11/9/09 Proposed Submittal	09/30/09 thru 2010	Mid-2013
Phase 1 – RAIs Issued to Applicant	09/17/09 - A	Schedule Not Yet Approved	Schedule not Developed	Schedule not Developed	Schedule not Developed
Phase 2 - SER with OIs issued	04/22/10 - T				
Phase 3 - ACRS Review	08/10 - T				
Phase 4 - Advanced SER	04/11 - T				
Phase 5 - ACRS Review	07/11 - T				
Phase 6 - Final SER Issued	09/11 - T			Prior to License Amendm't Request	

Discussion Topics

- Overview of Alternate Vendor Qualification Review
- Focus of staff review of COLA
- Proposed ACRS presentation schedule

Vendor Qualification Activities

- Review of STPNOC due diligence summary report
- Audits and inspections to support review of the STPNOC due diligence effort

Fundamental Questions

- What information may not be available to AV?
- How does STPNOC intend to fill gaps?
- Has STPNOC assessed AV's ability to reconstitute information?
- Has STPNOC done a reasonable job of scoping?
- Can they assume duties normally assigned to plant vendor?
- Can they manage design changes and support licensing process?
- Can they address differences?

Review of Design Basis Documentation

- Identification of reference material
- Categorization and disposition of reference material
- Identification of further inspection/audit needs
 - Pressure/Temperature limits
 - Neutron fluence projection
 - Containment analytical model
 - Hydrodynamic loads
 - Instrumentation & Control
 - Quality assurance

Inspection and Findings

- Conducted a week long inspection in Japan in July to assess AV's programs
 - Part 21
 - Appendix B program
 - Design control
 - Procurement document control
 - Control of purchased material
 - Corrective action program
 - Training and qualification
 - Initial test program

Summary of Staff AVQ Effort

- Staff conducted document review and inspection
- Staff effort summarized in SER Chapter 1
- Parts of review found throughout SER
- Inspection report available to public (ML092370709)

Proposed Schedule

- We have proposed 5 ABWR Subcommittee meetings between March and May 2010.
- Additional Subcommittee meetings to meet ACRS needs.
- Plan to present to full Committee in June 2010.