

1 UNITED STATES OF AMERICA
2 NUCLEAR REGULATORY COMMISSION
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4 MEETING WITH THE ADVISORY COMMITTEE
5 ON REACTOR SAFEGUARDS

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7 FRIDAY

8 DECEMBER 04, 2009

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10 The Commission convened at 9:30 a.m., the Honorable Gregory
11 B. Jaczko, Chairman, presiding.

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13 NUCLEAR REGULATORY COMMISSION
14 GREGORY B. JACZKO, CHAIRMAN
15 DALE E. KLEIN, COMMISSIONER
16 KRISTINE L. SVINICKI, COMMISSIONER

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2 PANEL:

3 DR. MARIO V. BONACA, Chairman, ACRS

4 DR. DENNIS C. BLEY

5 MR. HAROLD B. REY

6 DR. WILLIAM J. SHACK

7 DR. J. SAM ARMIJO

8 DR. GEORGE E. APOSTOLAKIS

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

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3 CHAIRMAN JACZKO: Good morning everyone, this is
4 one of our peer audit meetings that we have with the Advisory
5 Committee on Reactor Safeguards, and it comes right after
6 another meeting we had yesterday to christen the new meeting
7 room. So, I think it is a nice opportunity for us to focus
8 on specific issues that ACRS has played a significant role
9 in and helping us work through as an agency. I always find
10 these meetings particularly interesting as we hear from ACRS
11 and their views and their expertise on a wide ranging area
12 of NRC's activities.

13 I think these discussions are always extremely
14 valuable for the Commission as it looks at its
15 decision-making process. In particular,
16 to have that independent voice on technical
17 matters and their nexus with our regulations.

18 Today will be an important meeting where we will
19 talk about issues on containment overpressure, on issues with
20 the ITAAC process and design acceptance criteria, the AP1000
21 design certification review, and cyber security.

22 This is also a particularly important meeting for

1 us to say thank you to two members of the committee who are
2 changing their service to the committee, or moving their
3 service in a different direction, and the first is Mario
4 Bonaca who will be stepping down as the chair of ACRS.

5 We certainly want to thank him for his efforts in
6 that regard.

7 I think your second or third stint as chairman and
8 it was a very successful time. We certainly
9 appreciate your leadership on handling a large
10 number of complex, technical issues.

11 Among them is the work on SOARCA, the Containment
12 Accident Pressure, and I think you can take credit perhaps for
13 changing the name of containment overpressure to containment
14 accident pressure.

15 The ITAAC closure process and a variety of other
16 things.

17 The other individual I wanted to recognize was
18 Otto Maynard who has been with the committee for four years,
19 and he'll be retiring in January of next year.

20 We certainly appreciate his work and his focus on a variety
21 of significant issues.

22 Highlights certainly being the license renewals

1 for Indian Point and Oyster Creek, which are very complex
2 issues.

3 So, we appreciated his work there and his
4 contributions on the APWR design certification application.

5 To both of you, we thank you for your service and Mario, we
6 look forward to continuing to work with you in your new role
7 as a regular member of the committee.

8 Again, I look forward to today's meeting, we will
9 open up if any of my colleagues want to make some comments.

10 COMMISSIONER KLEIN: I would just like to comment
11 on again, what ACRS does on behalf of the NRC is really helpful.

12 The public confidence that it gives is
13 immeasurable.

14 It helps us on this side of the table and
15 obviously, subject to Senate confirmation, we look forward
16 to George being on this side the next time he appears here.
17 We look forward to continue the work on ACRS and thank you
18 again for all of your service.

19 Certainly, Mario, you did a great job and Bill I'm
20 sure trained you well as the previous Chairman, in terms of
21 activities and we hope Otto does well in his next life as
22 well.

1 COMMISSIONER SVINICKI: I would just add my thanks
2 as well and Dr. Bonaca, I will mention that we had an
3 opportunity to talk a little bit about some of the good
4 aspects of going back to your new old role of being a
5 member of the committee, that that there is a unique burden
6 and extra responsibilities that you've carried under your
7 term of Chairmanship.

8 Thank you for your willingness and it is wonderful
9 to be able to continue to have access to your work and your
10 expertise as a member of the committee.

11 I would like to thank Dr. Maynard for
12 his work as well.

13 Thank you.

14 CHAIRMAN JACZKO: With that, I will turn the
15 meeting over to you, Mario.

16 DR. BONACA: Good morning.

17 Next slide.

18 I will start now with a summary of accomplishments
19 that we have had since we last met with the Commission in June
20 2009.

21 Since that time we have issued 20 Letter Reports.

22 The topics included in those reports are License Renewal

1 Applications, ITAAC Closure Process, North Anna COL
2 Application and SER with Open Items, 3-Dimensional Finite
3 Element Analysis of the Oyster Creek Drywell Shell, TRACE
4 Thermal-Hydraulic System Analysis Code, Fire Protection
5 Issues, Steam Generator Action Plan Items, and Cyber
6 Security Programs for Nuclear Plants.

7 Some of these issues are very significant for us,
8 and is the subject of presentations that will follow mine.

9 Next.

10 As you remember we issued the letter in March 18,
11 2009, describing the ACRS position on Containment Accident
12 Pressure making several recommendations to facilitate
13 resolution of the differences between the ACRS and the staff
14 on the CAP issue.

15 We briefed the Commission on our recommendation on
16 June 4, 2009.

17 On that date, in response to our March 18, 2009,
18 letter, the EDO stated that the staff is evaluating some of
19 the ACRS recommendations which entail genetic
20 implementations, for example revising Regulatory Guide 1.82
21 but the EDO pointed out that these evaluations will take
22 some time.

1 In the near term, the staff is evaluating and factoring ACRS
2 questions and suggestions into its ongoing review of the
3 extended power uprate application for Browns Ferry Units 1,
4 2, and 3.

5 In September of 2009, the staff informed the
6 licensees of Browns Ferry and Monticello plants that, until
7 additional regulatory guidance is developed for dealing with
8 the CAP credit issue, completion of the review of the EPU
9 applications for these plants will be delayed.

10 In January it will be delayed for all plants that
11 require credit for CAP.

12 Next.

13 We will meet with the staff to discuss additional
14 regulatory guidance for the rest of the CAP credit issue
15 when the guidance is available.

16 Next slide.

17 I have a summary here of new plant activities and
18 you can see that we are pretty much engaged on five designs
19 and even amendments to existing certified design.

20 I will start with the ESBWR which is being led by
21 Doctor Corradini.

22 We completed the review of the draft SER Chapters for

1 the ESBWR design certification application, provided six
2 interim letters on 20 Chapters.

3 Currently reviewing the resolution of open items
4 and those of the resolution of ACRS raised issues, and
5 we plan to review the final SER as soon as it is available.

6 Next.

7 We reviewed the draft SER on North Anna, Unit 3,
8 COL application referencing the ESBWR design.

9 We issued that report on October 23, 2009.

10 Again, this effort was led by Dr. Corradini.

11 We are reviewing design certification application
12 and draft SER associated with the US-APWR design.

13 We issued a Letter Report with our review of the
14 Topical Report submitted by Mitsubishi -- "Defense in Depth and
15 Diversity," related to US-APWR design.

16 Next.

17 We are currently reviewing amendment to the AP
18 1000 design control document. This is a major undertaking, the
19 amendment is substantial.

20 We are reviewing draft SER on the EPR design
21 certification application. Dr. Powers is leading this effort.

22 We are reviewing the reference COL Application for

1 the AP 1000 design and the draft SER.

2 Actually, we will review -- originally the COL was
3 for Belafonte, and is now we believe it is shifted to
4 Vogtle.

5 We are continuing to interact with the NRO staff
6 to establish schedule for review of design certification and
7 COL Applications to ensure timely completion of ACRS review.

8 That is kind of a challenge, in a way, because we
9 have so many actions, but I think we can support timely
10 review of this application.

11 Next.

12 In the next two slides I am summarizing major
13 review activities.

14 There are other things we do, but these are the
15 most important that we have on the table.

16 Design Certification application, Combined License
17 applications, License Renewals, we always see them as
18 important , a critical step for many plants, Extended
19 Power Uprates, Fire Protection issues, Digital I & C and
20 Cyber Security, which has become a very important issue for
21 our review, Safety culture.

22 Next.

1 Rules and Regulation Guidance, Safety Research
2 Program, we will issue this year the biannual report on the
3 safety research, SOARCA, Containment Accident Pressure Credit
4 Issue, PWR Sump Performance, Reactor Fuels, Radiation
5 Protection and Materials Issues, these are really dominant
6 areas of engagement for us over the next six months.

7 Next.

8 On ACRS review of new reactor applications, I would
9 like to point out that we performed a short meeting, we call it a
10 mini-retreat on November 7, 2009, to focus ourselves on
11 optimizing our review of amendments to previously-certified
12 designs.

13 That is something we have not done before.

14 We find ourselves in a position where we are not
15 efficiently reviewing this amendment.

16 We worked out some plans on what we can do to
17 improve our review.

18 Specifically, to move on from a chapter by chapter
19 review to a different kind of approach which is the one of
20 identifying the reason for changes, the significance of
21 the change, the substance in it, and for us to focus much
22 better on the reasons for the amendment to the application.

1 As I said here in the second bullet on this page,
2 several operational items were identified for enhancements.

3 We have initiated discussion with NRO and EDO to
4 get support in obtaining different form of the information in a
5 way that we can better review it.

6 Next.

7 I would like to conclude my presentation with a
8 couple of observations on recent license renewal reviews.

9 Recent license renewal reviews, which are the
10 subject of two of the subsequent presentations, one on
11 Beaver Valley and one on Oyster Creek, really show
12 that the license renewal program continues to provide safety
13 benefits.

14 A number of these issues have been identified
15 because of license renewal applications, which has highlighted
16 the significance by inspections to observations, in some case
17 observation made without committee.

18 This is not the process by which we rubber stamp license
19 renewal. It is a process by which we find those who accept the
20 significant issues, and we deal with them and the benefit
21 comes also in the current license term because they are being addressed.

22 I conclude with the statement that says ACRS will

1 continue to focus on lessons learned from our reviews that
2 may have generic implications for other facilities. This
3 is how we operated in the past and will continue to do so.

4 This completes my presentation.

5 The next presentation is by Dr. Bley and has to do
6 with ITAAC.

7 DR. BLEY: Thank you.

8 Good morning.

9 As we do our reviews of the design certifications
10 and more recently amendments to the design certs and COL
11 applications, our interest in
12 the closure process for Inspections
13 Test Analysis and Acceptance Criteria, ITAAC,
14 has become more pointed.

15 In particular, that special case of ITAAC called
16 Design Acceptance Criteria, DAC, is growing on our
17 attention.

18 On the next slide I just want to spend a minute or
19 two of background to set the stage for the rest of it.

20 ITAAC, of course, and the closure requirements are
21 defined in Part 52.

22 The Commission's SRM on SECY-90-377 many years ago

1 stated that the applications for design certification should
2 reflect a complete design, except to accommodate as procured
3 hardware characteristics.

4 Which led to SECY-92-053 that came in response to
5 that use of design acceptance criteria during Part 52 design
6 Certs, and there, DAC was first defined and introduced, the
7 needs, the basis for needing it were described, and they
8 also gave a very thoughtful discussion of pitfalls that
9 could accrue from the idea of DAC.

10 That was, it had a lot of foresight in it.

11 Those issues that they raised are the same
12 ones we are starting to think about now.

13 Since that time, the ACRS has issued three
14 different reports addressing ITAAC and DAC.

15 On the next slide, next.

16 Our first report in this area was in 1990 and
17 requirements for design certification under Part 52 where we
18 agreed with ITAAC process itself.

19 We recommended that the staff narrow its focus to
20 the scope of that needed for safety.

21 Following that, in 1992, we issued a report on the
22 use of DAC itself.

1 In that report, we supported DAC for limited
2 applications, and that is a point we keep coming back to,
3 and noted that extensive use of DAC could be adverse to
4 safety and recommended that it be limited.

5 On the next slide we will talk about the main
6 focus of today, which is our more recent report this summer
7 dealing with Reg Guide 1.215 on closure of ITAAC.

8 I will start with DAC just because that's where we
9 will focus later.

10 In the Reg Guide it identified three options for
11 the closure of DAC.

12 Amendment of the design certification rule and in
13 fact, we are in the process of renewing the AP 1000 where
14 that is going on.

15 Identify the COL Application review process, so
16 far we have no COL applications that are closing DAC at that
17 stage they are being passed on.

18 Finally, ITAAC closure after COL issuance.

19 Next slide.

20 That third option is the one we think needs some
21 clarification.

22 As to the overall Reg Guide on closure of ITAAC,

1 the committee in this letter said that it provides an
2 acceptable approach for closing ITAAC.

3 However, we thought that the Reg Guide should be
4 revised to specify where the detailed closure process
5 guidance for DAC will be provided.

6 We understood that that detailed guidance is not in place
7 yet, but thought there should be at least a link to it in
8 the Reg Guide.

9 We also recommended that the DAC closure process
10 guidance should include an in-depth review comparable to the
11 usual design certification process to ensure adequacy of the
12 design.

13 In the letter, we talked about the fact that we
14 thought it needed to be an integrated system design review
15 that ensures adequacy as the as-built system, not just to fulfill
16 the stated design purposes, but also to identify and
17 eliminate unexpected failure modes – what things
18 could go wrong that could prevent the
19 otherwise successful completion of designs.

20 That is the hard part of the review.

21 It has always been the hard part of the review for
22 systems and the process.

1 Finally, we ask that the DAC closer process when
2 the guidance was completed be provided to us for review.

3 Following our letter, we were very pleased that
4 the staff has formed a task group, task working group to
5 develop the DAC resolution process.

6 We really look forward to seeing how these things
7 are spelled out at that point in time.

8 We note that you issued an SRM following a meeting
9 with staff to the SECY on ITAAC closure directing the staff
10 to complete the proposed revisions to the Regulatory
11 Guidance by the end of the coming year.

12 We look forward to an exciting year and an
13 interesting one in trying to follow this and moving forward.

14 That's the end of what I had to say today.

15 CHAIRMAN JACZKO: Probably won't be after we ask
16 questions.

17 DR. BLEY: No doubt.

18 DR. BONACA: The next presentation we have by
19 Harold Ray and the amendment to the AP 1000 design control
20 document.

21 MR. RAY: Good morning.

22 If we can go to the first slide, please.

1 This is on the AP 1000 amendment to the design
2 certification.

3 The design certification is just three years old
4 at this point in time.

5 The full committee did get briefings in both May
6 and in November, and as the Chairman mentioned, the process
7 that was introduced in May and has pretty much contended
8 until now, is the so-called chapter-by-chapter review of the
9 SER.

10 A necessary process, we understand, for how the
11 staff does its work, we are looking for some way, not to be
12 quicker as you will see I think we are keeping up quite
13 well, but to be more effective in our reviews by taking a
14 different lens and I will comment on that.

15 The work gets done, initially, in subcommittee.

16 We have had three two-day meetings so far, July,
17 October, and November.

18 The initial meeting in July as Chairman mentioned,
19 did include the Bellefonte Reference Combined License
20 Application, we've narrowed our focus recently, we will
21 return we expect to the Vogtle combined operating license
22 at some point next year.

1 Next.

2 Our status is current with the available chapters
3 in the SER.

4 This slide indicates 15 of 19. Since then,
5 we have done two more, so we are close to having
6 done our review at the subcommittee level of 19 chapters.

7 The body of work behind all of that, for example
8 is illustrated by about 100 of the 130 total open items
9 that remain open, and we look forward to the staff's closure
10 of those open items.

11 As I said, we have a meeting in January when we
12 expect additional chapters to be available, the few
13 remaining items albeit no doubt the most difficult ones.

14 Next, please.

15 The amendment reflects, as I said, three years
16 since the certification occurred.

17 Here I listed the changes the applicant itself
18 identified to us for highlighting what the amendment would
19 contain, and the first two items are as member Bley
20 mentioned, we see very positively and that we are closing
21 these information items or the DAC, and in fact, now have
22 evolved into informally at least, into a scheme in which the DAC can

1 be viewed as having tiers of closure in any given DAC, for example,
2 in instrumentation and control.

3 It is a learning process, it is certainly doing a
4 lot to provide more specificity in the certified design as
5 it will be amended.

6 The applicant also told us about NRC requirements
7 they were responding to that have emerged and standardization
8 that was taking place as they deal with the ongoing design
9 development and maturity of that design, and as they work
10 with their customers to identify improvements in the design.

11 Next, please.

12 In addition to the categories of change areas that
13 are involved, or the motivation for them I should say.

14 The applicant also highlighted for us the things
15 that they thought were most important in the application,
16 which we appreciate and find helpful.

17 They mentioned the developing security
18 requirements of the agency, and as I've already said, the
19 DAC in the areas of instrumentation control, but also human
20 factors engineering, and piping as these things are
21 developed and can become specific elements of the certified
22 design, rather than remain as DAC.

1 The containment sump and downstream effects were
2 long-term cooling, as we often think of it, will be
3 addressed and we have had one briefing so far on that
4 subject.

5 The topic, of course, which has gotten the most
6 public notice is at the top of the next page, the structural
7 design and seismic analysis.

8 Control room ventilation, some modifications in
9 the reactor vessel head area.

10 An area called ASTRUM, a methodology that is being
11 applied to enable best estimate calculations of the peak
12 clad temperatures for the design basis LOCA.

13 It is a significant change and calculation of
14 margins that will have an important effect as we move from
15 Appendix K, which is the basis of the certified design as it
16 stands today.

17 There are 100 technical reports outstanding, and I
18 will refer back to my comment about another way to look at
19 these things, this is a different lens as opposed to
20 chapter-by-chapter review of what, at the end of the day,
21 has to be a legal document.

22 These are a way that the applicant has addressed

1 technical issues more broadly.

2 The committee is looking carefully at those, they
3 may give rise to some additional requests for information
4 and meetings, so far that has not been the case, but we are
5 not yet done.

6 The bottom line in my last slide here, indicates
7 that there aren't any items that we have so far identified
8 in these three two-day subcommittee meetings, or in anything
9 else that has taken place, that have not previously been
10 identified by the staff and remain under staff review.

11 As is typically the case, we sometime get
12 information briefings, we don't attempt to reach consensus
13 or closure until the staff has had an opportunity to
14 establish their position.

15 That similarly concludes my initial remarks at
16 least.

17 DR. BONACA: Thank you.

18 The next presentation is by Dr. Shack on the
19 Oyster Creek Drywell Shell Finite Element Analysis.

20 DR. SHACK: Next slide, please.

21 One of the pretentious issues in the Oyster Creek
22 license renewal was the condition of the drywell shell,

1 which is the primary containment.

2 There had been significant corrosion of the
3 drywell shell that was identified in the late 1980s.

4 This affected mostly the lower spherical portion
5 of the shell called the "sandbed" region, and one thing I
6 want to note is that that corrosion was rather unevenly
7 distributed among the ten bays that formed the bottom of the
8 shell.

9 Some of them were, essentially, uncorroded and
10 others were sort of severely corroded.

11 The local loss of material could be up to 30%.

12 Next slide, please.

13 The corrosion was caused by water which leaked
14 from the cavity above the reactor vessel during refueling. It
15 ran down, collected in the "sandbed" region, which again,
16 had access to air, so it was aerated, it was not in close
17 contact with concrete so we don't get the usual beneficial
18 effect of increasing the pH.

19 So, it remained fairly aggressive and there was
20 significant corrosion due to this.

21 The licensee has taken measures to prevent further
22 corrosion, reducing the leakage, epoxy coating of the

1 "sandbed" region. They've removed the sand to essentially,
2 remove the contact with the moisture.

3 These seem to be effective, but there were no
4 measures taken to mediate the loss of material that has
5 occurred to date.

6 It was important to carry out analyses to ensure
7 that the containment, in fact, could maintain or provide,
8 meet the licensing basis requirements.

9 Next slide.

10 There've been a number of analyses done on the
11 drywell shell back in 1992, the licensee had General
12 Electric do one.

13 Sort of based on the technology of the day, they
14 sort of did a pie slice model using the ten fold symmetry.

15 So they could reduce the problem to a more
16 manageable size, but one of the things that forced them to
17 do was to use an average thickness, a uniform thickness,
18 rather than taking into account the fact that the thickness
19 might vary from bed to bed.

20 That is the current licensing basis analysis.

21 During the license renewal, the staff had Sandia
22 perform a new 3D analysis, which did take into account the

1 variation and thickness, but included sort of typical
2 licensing basis conservative assumptions for thickness and
3 the capacity reduction factor for buckling.

4 Again, it is important to note that that analysis
5 confirmed that the current configuration met the licensing
6 basis, and we are still consistent with the ASME Code
7 requirements.

8 However, they didn't quantify the actual margins
9 and in our February 2007 meeting with the ACRS, Exelon
10 committed to perform a more realistic 3D finite analysis
11 that would better quantify the actual margin that was
12 present in the degraded containment structure.

13 This commitment was included as a license
14 condition in the Oyster Creek license renewal.

15 We recently reviewed that analysis which was
16 submitted to the NRC by Exelon.

17 They had it performed by Structural Integrity.
18 It's a more realistic analysis, it used modified reduction
19 factors to give a more realistic estimate of the buckling
20 strength, and they performed base case and sensitivity
21 analyses to address the measurement uncertainty which is
22 still going to be present.

1 The Structural Integrity results suggested that
2 the actual margins for the as-found configuration are
3 significantly larger than the ASME Code requirements.
4 Essentially the stress margin for buckling is 3.4 versus the
5 2.0 minimum that you are required to have by the Code during the
6 refueling outage which is one of the limiting cases.

7 The Finite Element Analysis, next slide, uses a
8 very detailed model.

9 Modeled as a thin shell which is quite
10 satisfactory for the Oyster Creek drywell since it's got a
11 very large ROT ratio. They've modeled all the penetrations, used
12 a very large number of elements to get a very refined
13 picture of the geometry exam and mesh sensitivity to make
14 sure they got numerical convergence.

15 It's an excellent analysis of the assumed model of
16 the shell.

17 Of course, there are still uncertainties
18 remaining, because we don't really know the exact
19 characterization of the thickness in the "sandbed" region.

20 There is a question of what the actual values of
21 what the reduction factors are for the buckling loads.

22 Next slide.

1 Next slide.

2 The licensee characterized the UT thickness from
3 measurements on grids at one elevation, a single elevation.

4 They supplemented these by grids in the trenches
5 in bays five and 17 that they'd excavated to look underneath
6 the concrete.

7 Again, these measurements were supported by visual
8 examination, that is there was no significant thin regions
9 that were missed in the modeling in engineering judgment.

10 The Sandia estimates, as I mentioned, were more
11 licensing basis.

12 They looked at individual UT measurements of
13 locally thinned areas, so they took the thinnest regions and
14 used those to develop a thickness model.

15 It is more conservative, but allowing for the
16 conservancy that is know to be in the Sandia estimates we
17 would judge them as generally consistent with the licensee's
18 estimates.

19 The one thing we want to note is even if you get
20 the average thickness right, there is still a bay to bay
21 uncertainty. But in the 3D model that could lead to
22 essentially redistributions of load. If you.

1 underestimated one bay thickness but you
2 have more in the other, then you just sort of redistribute the load and
3 it really takes a decrease in the average thickness to
4 significantly change the real margin.

5 We think that the Sandia estimates provide a good
6 basis for concluding that there is not much likelihood that
7 the average thickness that is used in the licensee analysis
8 is significantly nonconservative.

9 The modified reduction factor, next slide, again
10 is used to count for the fact that no matter how elaborate
11 the Finite Element Analysis is, it assumes perfect shell
12 geometries which really aren't there.

13 These factors are introduced to account for
14 imperfections which can reduce loads by up to a factor of
15 five.

16 The primary justification we have for the values
17 that people use for the capacity factors are experimental
18 results, which are used as a basis for an ASME Code case
19 which was the basis for the calculation.

20 We hired a consultant to do an independent
21 analytical assessment, and that analytical assessment
22 showed, gave results that showed that the code case results were

1 slightly more conservative.

2 Again, we feel that the capacity factors used are
3 realistic and, perhaps, slightly conservative.

4 The overall report has been reviewed by the staff,
5 the ACRS, our consultants, Becht Nuclear Services.

6 There is general agreement that the analysis was done
7 using good engineering practice and judgment.

8 Our conclusion is that the analysis fulfills the
9 licensee's commitment to provide a more realistic analysis
10 that better quantifies the available safety margin.

11 Back to you Mr. Chairman.

12 DR. BONACA: Thank you.

13 Our next presentation is by Dr. Armijo and it's
14 about the Beaver Valley License Renewal and Containment
15 Liner Corrosion.

16 DR. ARMIJO: First slide.

17 Thank you.

18 In our letter of September 16, 2009, we recommended
19 approval of the application for license renewal for Beaver
20 Valley Units 1 and 2.

21 The critical issue that required our evaluation,
22 more evaluation than normal, was a localized corrosion of

1 the Unit 1 carbon steel containment liner.

2 This liner is 3/8 inch thick steel, it provides no
3 structural support, its only function is to prevent leakage.

4 So, in contrast to the Oyster Creek containment,
5 which Dr. Shack talked about, we didn't have to deal with
6 structural failure, we just had to address the issue of
7 leakage and continued corrosion.

8 The other function that the liners served and
9 contributed to the problem, was the fact it served as a form
10 during construction and the concrete containment vessel was
11 actually poured right up against the liner.

12 The structural strength of the containment 54-inch
13 thick reinforced concrete is the real containment.

14 There were two instances of corrosion on this
15 liner, one in 2006 and one in 2009.

16 Next slide.

17 In 2006, a large area, approximately 400 square
18 feet, was exposed during a steam generator replacement
19 project, and the liner-to-concrete surface was exposed and
20 three local areas were found to contain pitting corrosion.

21 These were very small areas, total area of about
22 three to four square feet in three separate locations,

1 representing roughly 1% of the exposed liner.

2 The rest of the liner was unaffected.

3 The pits did not penetrate the liner, the deepest
4 was approximately 40% of the liner thickness.

5 These were repaired, two areas were repaired by
6 cutting them out and replacing them with new liner material.

7 A third area with minimal corrosion was left in
8 place and baseline ultrasonic inspection was performed to
9 measure the thickness at that stage, and to monitor any
10 further corrosion in the future.

11 In fact, in 2009, another UT examination was made
12 of that area and no additional corrosion was found.

13 This pitting corrosion was attributed to corrosion
14 early in plant life.

15 These structures were built over a period of
16 several years as the concrete was poured and the containment
17 was built up.

18 At that time, the material is totally exposed to the
19 environment, it is not a particularly benign environment, if
20 you will.

21 They attributed most of that corrosion to early
22 plant life, although it is not really possible to tell

1 exactly when it happened.

2 Next slide.

3 In 2009, during a visual inspection of the inner
4 surface of the containment liner of Beaver Valley Unit 1, a
5 blister was observed on paint on the inside.

6 As the inspectors investigated that blister, they
7 found it was it was caused by rust deposits, large
8 quantities of rust.

9 As they cleaned it out, they found that there was
10 a 1 inch by 3/8 inch rectangular hole penetrating the liner.

11 Further examination revealed there was a
12 decomposed piece of lumber, wood, 2 by 4 by 6 inches long at
13 the exact location where the hole occurred.

14 This wood was taken to the laboratory and
15 examined.

16 It was found to contain about 13% moisture and it
17 was slightly acidic, a pH of 3.7.

18 The wood was a construction spacer, which was used
19 to keep the liner from the rebar as the concrete was poured.

20 According to their quality assurance documents it
21 should have been removed, but it was not.

22 So, that was the root cause of the problem.

1 It is not unusual, similar events have been
2 observed in DC Cook Unit 2, North Anna Unit 2, and Brunswick
3 Unit 2, all of which were reported in 1999, in which wood or
4 other organic materials such as a leather glove behind the
5 liner caused accelerated corrosion of the steel.

6 Next slide.

7 The mechanism responsible for the two wall liner
8 corrosion is reasonable well understood.

9 Typically in a concrete structure, steel is
10 protected from corrosion in the event any water gets into
11 the structure, the water equilibrates with the materials in
12 the cement forming a basic environment.

13 In this environment the steel is typically
14 referred to as being passivated, that is its corrosion rate
15 is extremely slow and it's protected.

16 Typically, in the 2006 inspection of the Beaver
17 Valley liner, we don't know what actually caused it because
18 the concrete was removed by hydro-lazing, but where the
19 concrete and rebar was examined there was no damage at all
20 to the rebar.

21 So, we know that the corrosion in the case of
22 Beaver Valley during the 2009 discovery, was caused by the

1 acidity of the wood controlling the environment, as opposed
2 to the normal concrete-to-liner basic environment.

3 Unit 2 was different, it was constructed about ten
4 years later. Construction practices were different and they
5 used welded angle iron to provide the spacing.

6 So, there should be no wood between those
7 interfaces, but we can't really prove that without testing.

8 Next slide.

9 In the future, the licensee has committed to
10 perform visual inspections of all accessible liner surfaces
11 of both units.

12 Since the mechanism of failure could have been a
13 result of systematic errors, for example leaving more
14 spacers, that is one possibility, the other
15 possibility is there could've been random situations.

16 The inspection program that has been committed to is
17 to do focused inspections in non-random areas using
18 volumetric ultrasonic testing.

19 These will be performed at eight locations in each
20 unit and it will be guided by the knowledge of the system.

21 In addition, 75 or more randomly selected areas
22 will be examined by UT to get a statistical evaluation of

1 the overall condition of the liner.

2 Next slide.

3 The inspections of the Unit 1 liner will be
4 completed in time for the corrective action to be performed
5 before entering the period of extended operation.

6 In fact, the Unit 1 liner visual exam will be
7 completed in 2010, the non-random exam in 2010, and the
8 random exam by 2016.

9 The Unit 2 operation examination will be completed
10 before 2027.

11 Next slide.

12 Based on all this information and our evaluations,
13 we concluded that the proposed inspection programs and
14 related commitment provide reasonable assurance that the
15 liner integrity will be adequately maintained during the
16 period of extended operation.

17 Next slide.

18 The staff has initiated several activities to
19 include supplementing Inspection Notice 2004-09, and making
20 potential changes to the NRC's outage inspection procedures
21 for additional guidance on containment walkdowns.

22 The ACRS is expecting a briefing the middle of

1 next year regarding containment liner corrosion issues and
2 actions that the staff intends to take to address them
3 generically for operating plants.

4 Thank you.

5 DR. BONACA: Our last presentation we have
6 scheduled is from Dr. Apostolakis on cyber security.

7 DR. APOSTOLAKIS: Last month we reviewed
8 Regulatory Guide 5.71 "Cyber Security Programs for Nuclear
9 Facilities", which has been developed to help the licensees
10 comply with 10 CFR 73.54.

11 This rule requires that licensees produce policies
12 and plans for cyber security by November 23, 2009, last
13 month.

14 The rule also requires that the licensees provide
15 high assurance that computer and communications networks are
16 adequately protected.

17 We concluded that the Regulatory Guide, which is
18 based on NIST, National Institute of Standards and
19 Technologies, standards is helpful in developing the plans, but does
20 not provide adequate guidance as to how adequate those plans
21 are.

22 Which, of course, is one of the requirements of

1 the rule when it asks for high assurance.

2 The Regulatory Guide adapts generic lists of
3 security controls that are listed in the NIST documents, and
4 these were not developed having nuclear plants in mind.

5 So, we recommended in order to remedy this on the
6 next slide, that after the initial, obviously there was no
7 time to ask for pilot projects because November 23 was
8 imminent.

9 We recommended that after the initial
10 implementation of this guide, it should be revised to take
11 advantage of the lessons learned and the insights that would
12 be collected after the licensees try to implement this
13 guide.

14 In terms of longer term research projects, as you
15 know the ACRS always asks for research, we purpose that maybe a
16 greater use of the insights from probabilistic risk
17 assessments would be helpful in the security area.

18 In particular, the damage to the core will have to
19 follow one of the sequences that are listed in the PRA's.

20 Now, I don't want to say that 100% of those will be
21 there, but it would be interesting to investigate whether we
22 can take advantage of that and maybe there will be new

1 sequences that will be created by a cyber attack, that's
2 fine, and see whether we can put some order in the way we
3 are implementing the security measures, which right now really
4 are based on the judgment of experts.

5 This would be a very similar analysis the way we do
6 seismic evaluations, fires, we have the baseline PRA with
7 the accident sequences, and then we see how the earthquake might affect
8 those sequences, so the same way how can a cyber attack affect
9 those sequences.

10 We feel that there ought to be a better
11 understanding and better guidance regarding the interaction
12 within cyber security and safety.

13 People have talked about certain measures we
14 might take for cyber security might be detrimental to safety, possibly vice
15 versa.

16 We need to understand this a little better.

17 That is another longer-term research project that
18 we are recommending.

19 Finally, supply chain attacks, these are mentioned
20 in the Regulatory Guide, but they're just mentioned really.

21 We felt that maybe this is an area that needs to
22 be investigated further, because it might be a way of

1 attacking the facility.

2 This is where we stand on cyber security, Mr.

3 Chairman, back to you.

4 DR. BONACA: Thank you.

5 This concludes our presentation.

6 CHAIRMAN JACZKO: Thank you.

7 It was, as usual, a very interesting, informative

8 presentation.

9 We will begin our questions with Dr. Klein.

10 COMMISSIONER KLEIN: Well, thanks for a very good

11 presentation.

12 I guess I will start in the order of the

13 presentations, so I get to start with Mario, but others can

14 comment as well.

15 If you look back at when we started license

16 renewals, that was sort of a new process, we have now gone

17 through that.

18 I guess I would like to hear your comments on

19 where do you think we are with the COLs, compared to how we

20 were with the license renewals?

21 In other words, if you look at where we are now in

22 the COL process, how do you think that compares to when we

1 first started the license renewals?

2 Do you think we are better prepared, better

3 focused than when we started in license renewals?

4 DR. BONACA: I think when we started license

5 renewal, the process I think moved pretty rapidly to really the same process

6 we have today.

7 We had the benefit of many years of preparation on

8 the part of the staff that produced the GALL report, for example.

9 So, the technical basis for the evaluation we were

10 performing at the time was available, was recognized.

11 I think the faculties we had at that time was mostly

12 for interpretation of the issue of what passive component meant so

13 the distinction of the scope, scoping issues and if you

14 remember for a number of years their interaction with NEI in

15 defining items in scope and not in scope.

16 We got kind of concerned on the side there've been

17 changes.

18 The process was tracked pretty rapidly.

19 I really haven't had time in making a comparison

20 with COL.

21 I think we're probably in a similar situation.

22 I think that the rules are clear of what we are

1 supposed to do, and I don't think there is much of a
2 disagreement with the industry about scoping issues of any
3 other kind.

4 COMMISSIONER KLEIN: Any other comments from
5 anyone else?

6 Just as where we are with the new process, do you
7 think we are pretty good shape on the COLs?

8 DR. SHACK: The scope is so much larger than
9 license renewal, it is really hard to make the comparison.

10 We will be dealing with issues like DAC, which are
11 really completely new to us.

12 Evaluating an aging management program is, in some
13 ways something that the staff is relatively familiar
14 with.

15 DAC is a whole new process for going through an
16 evaluation.

17 We are just getting started.

18 COMMISSIONER KLEIN: In that regard, in terms of
19 ITAAC, I think that's an area that there is still some
20 uncertainty, do you think we are on a resolution path on
21 ITAAC?

22 DR. BLEY: There is uncertainty, and I guess I

1 should say the committee hasn't reached many conclusions
2 beyond the ones I talked about.

3 We have discussed this quite a bit.

4 I think we're all pleased that there is now a
5 working group in place to develop details of how, in fact
6 these DAC are going to be closed.

7 It is easy to envision problems, and for me, a
8 process like this hasn't had a pilot, the first real one is
9 going to be the pilot.

10 That feeling is the first couple need a much
11 closer look to see if they are really doing what we expect
12 them to do.

13 I am not sure we can learn anything from it, but
14 since we have the AP 1000 Amendment going on, we are seeing
15 a lot of changes, DAC aren't being resolved as DAC.

16 There is a review and completion, but one might gain something
17 from seeing the kinds of questions that come forward in that review and
18 trying to envision how the process, when it's defined, will identify the same
19 kind of problems that are being picked up now.

20 MR. RAY: Perhaps I can add a comment.

21 I really think, at this point, the First Amendment
22 and AP 1000 is the one and only thing I have to really use

1 as a basis of comparison, but I think it's a generic
2 observation.

3 The First Amendment is going to be different than
4 everything after that.

5 Initially, the certification you don't have
6 customers the way you do when you're coming up to the COL
7 process as the AP 1000 is doing.

8 A lot of the experience that we are having now I
9 think is a unique one-time event that once beyond this and I
10 think your question would go more to the longer-term outlook
11 for the process, like license removal possibly.

12 It may be too early to tell, but I think we will
13 converge in that direction.

14 I just think right now, we are doing this initial
15 amendment, which everyone can expect to occur as the initial
16 implementation, the initial sighting, the initial
17 construction takes place.

18 I think it will be very different later and much
19 more similar to what you're asking about.

20 COMMISSIONER KLEIN: Harold, you had mentioned it
21 during your presentation on the AP 1000 that obviously,
22 we've heard some discussions about the containment and the

1 sumps, do you think we are on a path for closure on those
2 issues?

3 MR. RAY: Yes, Dr. Klein, but I will say whether
4 it takes place as part of this amendment or takes place more
5 generically, specific to the AP 1000, I think has yet to be
6 decided.

7 That is really a discussion between the staff and
8 the applicant.

9 There is an expectation we are well aware of that
10 we will resolve that entirely, but the needs of the
11 amendment closure that we are currently engaged in may or
12 may not allow that to happen.

13 I don't want to hold out too optimistic a
14 prospect, but if it doesn't it will get resolved.

15 COMMISSIONER KLEIN: Thank you.

16 Bill, obviously George mentioned the ACRS always
17 likes to look on research activities, and any good faculty
18 member would want to do that, but in terms of the
19 capabilities if you look at the 3D modeling that we have
20 available today, could you just comment on how much better
21 we are able to do our analyses with the computational
22 characteristics that we have, compared to the initial

1 licensing?

2 It seems to me that our technology for modeling is advanced
3 pretty much.

4 DR. SHACK: Yes, it has made dramatic
5 improvements.

6 We can handle routine problems like pressure
7 relief of structures, we are still doing researches as
8 failure problems.

9 Especially taking probabilistic estimates, a
10 deterministic analyses have advanced enormously, and we can
11 do much more complex geometry, much more realistic estimates
12 of those.

13 Dealing with failure of structures in a
14 probabilistic sense, once you get past the deterministic
15 one, if you're really looking for probabilistic estimates,
16 we are still developing that technology.

17 COMMISSIONER KLEIN: Thank you.

18 Sam, on the liners, the corrosion that you
19 addressed, in general is there a coating between, on the
20 backside of the liners?

21 DR. ARMIJO: No.

22 There may be, but typically it is just carbon

1 steel with the milled scale from fabrication of the steel,
2 that's it.

3 That was 19, early 1970s technology.

4 They made newer materials, newer construction, they may
5 in fact try paints, but I think it may not be a good idea, because the concrete
6 does provide a very nice chemical environment in the event that
7 you do get moisture there.

8 That has been proven over time.

9 COMMISSIONER KLEIN: I remember from my prior
10 university life that if your containment, for most research
11 reactors, trigger reactors, the tanks are aluminum and
12 aluminum and concrete don't get along.

13 DR. ARMIJO: I agree with that, that is a basic environment, aluminum
14 isn't really good there.

15 COMMISSIONER KLEIN: George, you had talked about
16 the supply chain and a lot of times what the Department of
17 Defense does in areas that are very critical, they've gone
18 for a supply chain that is called a trusted foundry, where
19 there is, minimize the chance of anyone doing anything bad,
20 particular in micro-electronics.

21 Have you looked at anything like the digital
22 instrumentation and control that the industry should look at

1 trusted foundry types?

2 DR. APOSTOLAKIS: I don't think we have been
3 informed about that.

4 I don't think anybody has said anything.

5 Maybe we can learn from the Department of Defense,
6 but this is not something that has come up in our
7 deliberations with either the staff or the industry, but
8 that is certainly a good idea.

9 COMMISSIONER KLEIN: Thanks, no more questions.

10 CHAIRMAN JACZKO: Commissioner Svinicki.

11 COMMISSIONER SVINICKI: I just want to follow up
12 quickly, Mr. Ray on the AP 1000, I know that Dr. Klein asked
13 about that already.

14 First of all, thank you, I know you stepped into
15 leading this activity at a time where there is a whole
16 lot going on, and I am sure that was not a real easy entry,
17 but I appreciate your willingness to take on this lead role
18 on AP 1000.

19 One thing I thought of is on the shield building.
20 My understanding is that experts and consultants on this are
21 being hired up very quickly between the designer and the NRC
22 Office of Research, we have some consultants that we have on

1 contract.

2 Are you concerned at all that when ACRS gets to
3 the point that you might need to have some experts on
4 contract that you won't be able to find anyone that isn't
5 already conflicted out and working with somebody else?

6 MR. RAY: My colleagues are laughing because I
7 think they imagine you must've heard our discussion
8 yesterday.

9 COMMISSIONER SVINICKI: There are no bugs in your
10 new area.

11 MR. RAY: It is too soon for me to be concerned, I
12 think to answer your question, but I am certainly
13 anxious to see that person walk through the door, and we do
14 recognize the need you're actively considering how to meet
15 that need.

16 I appreciate your reinforcing with us that it is
17 something we do need to do, and as you said, the
18 availability of people who could independently advise us is
19 one of the factors that we are concerned about.

20 Also, the short time that we likely are going to
21 have once it does come to us to reach some conclusion is
22 another concern.

1 That is all I could say at this point.

2 COMMISSIONER SVINICKI: Okay, very good, thank
3 you.

4 At least through the knowing laughs of others, you
5 are at least cognizant of it and focused on it, I just
6 wanted to raise it as it issue of awareness.

7 That is very good.

8 Dr. Bley, I don't really have a question on design
9 acceptance criteria, I appreciate that you're highlighting
10 it.

11 We have heard about it consistently from the ACRS
12 and I think Dr. Shack mentioned it as something, it is new
13 conceptually, so both the committee and staff are going to
14 have to really work to have a framework for addressing the
15 design acceptance criteria.

16 Maybe I will ask you, your presentation was clear
17 and that it's an issue, being worked and so I'm not asking
18 this in terms of your having any kind of conclusory
19 statements, but do you think that staff is making progress
20 in terms of refrain work for addressing DAC on a schedule
21 that is a pace with what it needs to be?

22 DR. BLEY: That is a hard one for me to answer.

1 Their working group has just been established and
2 we saw one of the first presentations, so it looks like they
3 are organized and ready to go.

4 We haven't met with the working group or haven't
5 seen their schedule, but I think it is clearly high enough
6 visibility that it is taking off so we are hopeful but we
7 are not aware of where they stand.

8 COMMISSIONER SVINICKI: Okay, I will look forward
9 to hearing the ACRS's updates on this issue and in the
10 months and years ahead.

11 This is following up a little bit on Dr.
12 Klein's line of questioning, but it is probably stepping
13 back quite a bit and raising it much or generally.

14 It has to do with, I will start by saying that
15 pretty soon I will have been two years serving on the
16 Commission, and in my service here I will speak for myself,
17 but it has really been an enhanced and supported by the work
18 of the ACRS.

19 I was reading, I am a fan of history, I am no
20 great expert on history, but a fan of history and I was
21 reading Truman Commission from 1949 did a study of
22 government structures.

1 They had a few chapters on independent regulatory
2 agencies, so I thought what were people thinking 60 years
3 ago about independent regulatory agencies, and it's amusing
4 if anyone wants to look it up and read it.

5 How what could have been written much more
6 recently than 60 years ago, but it's interesting that an
7 element in there is advisory committees to independent
8 regulatory commissions.

9 This report precedes even the creation of the AEC
10 so it was not something that was considered in there, but
11 again, as I mentioned before, ACRS's history is a long
12 historic one, it goes back to the AEC itself.

13 One of the things that I think about now in terms
14 of the work of the ACRS is that it's a tremendous workload
15 between the license renewals, the design certs and the COLAs

16 You mentioned in here your mini retreat and that
17 you are looking at how you go about some of your review
18 activities and you are working with or meeting with the EDO
19 and I appreciate that because obviously there is a
20 substantive engagement with the staff, but at the end of the day, and I will
22 speak for myself, the ACRS's views on things are always a part of my

1 deliberations in any matter that you taken up and issued a report on, or a
2 position on that is a factor for me and my work.

3 One of the things, it is obvious the specific
4 value that you bring.

5 We heard about Beaver Valley and Oyster Creek, and
6 as a body of experts you each are there ostensibly assigned
7 one level of expertise or something that you represent, but
8 then as a collective I think your reviews bring so much more
9 than really the sum of the parts.

10 What I count on and I think historically the ACRS
11 has done this, the best way I can describe it is a term that
12 might mean something only to me, I hope that's not the case,
13 I call it the spaces in between.

14 The spaces in between the chapters that you take
15 up in between the topical reports that you look at.
16 Meaning, if there is something that is not being
17 looked at or addressed I think that the Commission would
18 expect that the ACRS is finding those gaps and I worry with
19 a workload that is as substantial as it is, does it become
20 more mechanistic or formulaic.

21 I don't think historically the Commission has
22 desired that the ACRS be like another last check on merely

1 what the staff did, but an identifier of any other essential
2 thing that the Commission should know about before it acts.

3 I don't know, we have some newer members of the
4 committee and some newbies like Dr. Shack here who has not
5 had any long service.

6 Would any of you weigh in on that?

7 The newer members have a fresh set of eyes and
8 those of you with long service, is this something as a group
9 you think about and try to say, you know, is there kind of
10 anything in between the individual things we're looking at.
11 Are we making sure that it is all there?

12 DR. BONACA: One thing that the ACRS does every
13 month, we have this PMP which is a management review of all
14 the work that is coming from the staff and, essentially, we
15 are planning sessions.

16 The planning sessions always end up with an assessment of feasibility,
17 can it be done?

18 What does it take?

19 Until now I think we are satisfied and we can
20 cover the ground that we are covering.

21 It doesn't mean that if we have too much workload, is it
22 acceptable to skip some material.

1 People are pretty conscientious from what I see
2 about reviewing supporting topical and that kind of information.

3 We have to be sensitive to the fact that right now
4 we have a huge amount of workload coming our way.

5 I tried to mention some of the individuals that are chairing individual
6 review group designs and they are experienced individuals.

7 COMMISSIONER SVINICKI: We have heard comments on
8 the chapter-by-chapter reviews that is a necessary framework
9 but maybe not the best way for the ACRS.

10 DR. BONACA: Absolutely, for example that is only
11 one-way.

12 At some point we felt pretty comfortable with the
13 review of design on the chapter-by-chapter that has been
14 done for the US-APWR.

15 We have expressed concern about not having all the
16 chapters available at the same time.

17 With that kind of concern we still have been able
18 to go chapter-by-chapter.

19 It makes sense.

20 You get a kind of design we try to apply the same
21 process of chapter-by-chapter to the amendment to the AP
22 1000 and it didn't work out.

1 What we are finding was chapters with a lot of
2 notation of changes, but no clear indication of where the
3 changes came from so we are losing perspective of what is
4 driving the changes and the substance behind them.

5 That is why we had immediately, really within a month we realized
6 we needed a mini-retreat to deal with this issue and to have all the
7 experience of the members brought to bear on what is a better way to do it.

8 In this case, for example, we would need the help
9 of the staff to help us formulate some of the information in a
10 way that is accessible, for example, system by system or
11 issue by issue that may be affecting.

12 For example, sump issue is one that we are dealing with
13 and we have to understand where the issues are, where
14 they're coming and so forth.

15 We also need to probably work with our senior staff,
16 support staff, within the ACRS to help us formulate the material
17 in a way that is accessible to us.

18 I think we are doing what we need to do at this
19 stage. My sense is that we can do fine.

20 There may be a time in which we may need some
21 other help and we will certainly bring it up.

22 COMMISSIONER SVINICKI: I appreciate that. I look

1 forward to understanding more as the ACRS works through
2 internally how best to go about this, and also I credit you
3 and I am very encouraged that when you noticed that your
4 usual approach was not probably the best for the amendment
5 that you stepped back and tried to work through a better
6 way so I appreciate you doing that.

7 I just had one other question, Dr. Apostolakis, I
8 appreciated the presentation on cyber security and I think
9 some of what I read may be between the lines in the ACRS
10 letter report on that was that it is just a very dynamic
11 area, and I think that I need look no further than the
12 newspaper to understand that the whole of the government is
13 struggling with how to respond on cyber security.

14 It is a bit of a foot race between the technology,
15 evolution, the adversary capabilities, and then the
16 government response and the private sector response as well.

17 My very general question to you would just be
18 similar to what I asked Dr. Bley, do you think that the NRC
19 staff, the agency response on cyber is resourced, and are we
20 leaning forward in a way that is commensurate with what we
21 need to do on cyber security?

22 DR. APOSTOLAKIS: I think it is still in its early

1 stages.

2 We are learning, things are moving very quickly.

3 So, I think the staff had to do something with
4 respect to the Regulatory Guide, NIST had those standards,
5 they used them. And I think there is much more work to be
6 done, but again, I want to point out it is not that the
7 staff people know how to do it and they didn't do it, nobody
8 knows how to do it especially the way that the attack may
9 come is something that is a big mystery.

10 It is not only the cyber area, I think general
11 security concerns.

12 The weakest link is the attack itself, so I think
13 the field is still in its infancy and we are all doing our
14 best.

15 COMMISSIONER SVINICKI: Thank you.

16 I would just add to what Dr. Klein had said in
17 that, since we can't know whether this may or may not be
18 your last appearance before us as a member of the ACRS, I
19 want to thank you for your long service to the ACRS, not
20 just on cyber, but all that you've done and from what I have
21 observed you are someone who very much has the respect, and
22 I would say perhaps some good-natured affection from your

1 colleagues and so I hope the Senate will act on your
2 nomination favorably and when they have the
3 opportunity to do that and with dispatch I think the
4 President has made a very wise selection.

5 DR. APOSTOLAKIS: Thank you very much Commissioner.

6 CHAIRMAN JACZKO: Thank you.

7 I wanted to turn to an issue, Mario, that you
8 touched on, it's the Containment Accident Pressure.

9 We seem to be, at this point, in a bit of a hold
10 point pending some additional update and guidance.

11 My question in this regard, I think that you
12 mentioned that several of these licensees that are looking
13 at relying on the Containment Accident Pressure in their
14 extended power uprates to justify some of their actions will
15 be kind of in a hold pattern until the guidance updates are
16 done.

17 In some of those cases do you or the committee
18 believe that there are ways to resolve their issues without
19 the need for Containment Accident Pressure, to allow those
20 to go forward with an approval if they were to make
21 modifications or other changes in their program?

22 DR. BONACA: I think that the letter we wrote

1 outlines, in fact, a way that we could go about it.

2 I think it is not a traditional way of gathering
3 information, design basis only asked for additional information on the best
4 estimate which becomes basic judgment.

5 I think we can get to the point where there is a
6 solution to the issue.

7 CHAIRMAN JACZKO: Are licensees taking that path
8 from your understanding, or are they waiting to see where
9 the staff comes out with guidance updates, or is it that all
10 part of the same program?

11 DR. BONACA: I really can't tell.

12 It would not be an informed judgment.

13 I think they are just waiting and seeing where we
14 are going with that.

15 This methodology that the BWR owners group has developed is
16 coming in fact we will be reviewing it the early part of next year.

17 That may provide a solution.

18 It seems to be attractive and seems potentially
19 successful.

20 We haven't reviewed it yet, but I know the staff will
21 be reviewing it.

22 MR. DENNIG: Bob Dennig, NRR/DSS. We have been in touch with the

1 industry throughout this process, in particular with the BWR
2 Owners Group, and we expect in the new year, the beginning
3 of the new year to be in a dialogue with them, a formal dialog, over what we
4 found and what we might propose and get their feedback, and
5 my impression to date is that licensees are, to a certain
6 extent taking a wait-and-see, they're somewhat impatient to
7 get on with things, but they understand the situation.

8 CHAIRMAN JACZKO: This is one of many meetings
9 where we have talked about, and as I said it used to be
10 Containment Overpressure, we changed the O to an A, and I
11 don't know if that's progress, but it is certainly
12 something.

13 As I've generally said, I think this is an issue
14 the ACRS has provided us with a clear case for why there are
15 some concerns with the methodology that is currently being
16 used or the approach that is currently being taken, and I
17 think there are easier ways to deal with that which is one
18 case to consider alternate ways to address the concerns
19 without relying as much on the Containment Accident
20 Pressure.

21 I certainly continue to encourage both the staff
22 and applicants to consider those as perhaps a more successful path

1 to resolve these issues in a more timely way, but we will
2 see as that goes forward.

3 Along the similar lines, we have another issue
4 that has come up in the past and I suspect the committee has
5 not had an opportunity to reevaluate this issue, but I
6 thought I would just ask if you have any general comments at
7 this point and that's on the use of the TRACE Code, in
8 particular, as it applies to the ESBWR design.

9 Back in July we did get a letter from the
10 committee expressing some concerns with the use of TRACE, or I
11 guess I should say that perhaps the use of TRACE has not
12 been fully demonstrated, or the applicability has not been
13 fully demonstrated for all accident sequences or analyses
14 that are necessary for ESBWR.

15 The staff did provide a letter back to the ACRS in
16 October that, to some extent, agreed and in other areas
17 disagreed perhaps with where the committee is.

18 I'm not sure if that's an accurate assessment, but
19 perhaps if you want to comment where you see this issue
20 going forward, is this one where we may be at a bit of a divide
21 between ACRS and the staff and without any clear path
22 forward for resolving that.

1 DR. BONACA: We will refer the question to Doctor Banerjee

2 DR. BANERJEE: Sanjoy Banerjee. I don't think there are any substantial
3 disagreements between the staff and the ACRS, there may be a
4 difference in emphases on different subjects.

5 So far as the ESBWR is concerned, I think the
6 committee feels generally that TRACE is applicable.

7 What we urged was that the same level of
8 applicability be demonstrated for the other new designs and
9 with each of these new designs there are some new features
10 which require to be modeled.

11 I think that is in process, but we urge some haste
12 in some ways, because these are going to come up pretty soon
13 and we would like to see confirmatory analysis being done
14 for each of the new designs.

15 Besides that, there are very detailed technical
16 issues that arose with the peer review and things like that,
17 but the committee has generally supported TRACE and, in
18 fact, in the last two or three years we have really provided
19 a lot of input and impetus to move it forward and make it part of the
20 confirmatory process.

21 We are very much of the view that this process
22 should be continued, and we urge the staff to do that as quickly as possible.

1 CHAIRMAN JACZKO: I appreciate that clarification
2 and I certainly would agree.

3 I think it is important that we resolve this so
4 that as you get to the point where you are doing your
5 reviews on some of these other designs, that this doesn't become an issue that
6 causes unnecessary delay. Obviously if there are safety issues, but
7 if it is simply an issue of needing an analysis that's not
8 complete hopefully we can get that resolved.

9 I wanted to follow up a little bit on some of the
10 comments that Dr. Klein and Commissioner Svinicki made about
11 new approaches to the reviews and looking at the reviews on
12 the design certs and the COL applications and amendments in
13 particular, perhaps if there are better ways to do that than
14 are currently done.

15 One of the issues that is out there which I'm not
16 sure if the committee has put much focus on yet, is the
17 potential for a renewal of a design certification.

18 The ABWR is at the point where we are anticipating
19 at least one request for renewal of that design cert and
20 just to throw that out there and ask if the committee is
21 prepared to respond to that or if you have any questions
22 about how that review should proceed, or any insights you

1 have at this point.

2 DR. ABDEL-KHALIK: I am Said Abdel-Khalik. The committee has a
3 clear path for how we are going to proceed with this, both the ABWR license
4 amendment to deal with the aircraft impact and COL application
5 that STP will bring forward.

6 CHAIRMAN JACZKO: But at this point nothing
7 specifically on the renewal of the ABWR, and again, the scope
8 of renewal – I was just looking at the regulations on this, the scope
9 of the renewal on this case is not a very expansive renewal.

10 I think it's fairly limited, but I would assume
11 that ACRS would have review role in that and that may be
12 something that we just have to flesh out.

13 DR. ABDEL-KHALIK: We already have subcommittee meetings
14 scheduled for March and May of 2010.

15 CHAIRMAN JACZKO: Good. Thank you.

16 Turning to the issue on the design certifications
17 and the DAC, as I was reviewing the letter on DAC and some
18 of the concerns with the DAC process, and the interest of
19 having the ability for ACRS to have sufficient information
20 to do the review that they think is appropriate.

21 Two questions, the first one is, is to some extent
22 the concerns with DAC driven specifically by DAC that

1 reference digital instrumentation of control systems, or is
2 it applicable to all the systems that involve or potentially
3 could have DAC.

4 DR. BLEY: The place we're most concerned is
5 digital I&C and also the human factors engineering, although we
6 did not speak of that directly in the letter, the piping
7 side, we feel that that can be handled reasonably well and
8 don't see some of the worries we see on the other two.

9 CHAIRMAN JACZKO: That is helpful and I think as
10 we go forward as well as on the cyber area
11 that digital I&C is still an area where we are learning
12 and where I think we will continue to learn, and certainly
13 in the DAC area it is perhaps one of the areas where DAC is,
14 if anything, most likely to continue to be used because of
15 the rapidly evolving nature of the implementation and the
16 controls of the digital systems.

17 They change so quickly that by the time you would
18 get a design actually approved and if you want to use that
19 designed 30 years later those systems may be obsolete in a
20 very different way than analogue systems become obsolete.

21 I think it's an area where we will need to make
22 sure we do have the right approach to that.

1 I think the staff in their response to the ACRS, did make
2 a good point which is that the process is established, the
3 finality will have to happen at the COL stage.

4 The approach that they've taken with the committee
5 is to suggest that they work with you to make sure you have
6 the information at either design certification or COL
7 stage to ensure that you have the sufficient information to
8 do the reviews, and allow that to move forward.

9 It is an area where I think we will all perhaps be
10 challenged as we get beyond the COL when we work to flesh
11 out the digital instrumentation and control.

12 The last question that I had was a question for
13 George.

14 One of the things you talked a lot about, the
15 committee talked a lot about, in particular in the I&C arena
16 is the role and the use of PRA in the digital I&C area.

17 What I've always taken and I think from some of
18 the discussions we've had at these meetings is that a lot of
19 the software errors and hardware errors may be design error,
20 in which case they're not properly modeled in the PRA arena.

21 When I saw the letter on cyber and the suggestion
22 in the cyber area the committee was suggesting the use of

1 probabilistic models, I wasn't sure if that was consistent
2 from what we heard from the committee in the past about the
3 role of PRA in digital systems, or if I'm not quite
4 understanding, I think from your discussion I think I
5 understand a little bit better and it is consistent, but I
6 thought maybe you could clarify that.

7 DR. APOSTOLAKIS: There are two issues here.

8 One is, if I have a digital system can I use PRA
9 methods to find errors and so on, sequences that may lead to
10 undesirable events.

11 That is where the problem of design errors is that
12 in risk assessment we really assume that initially the
13 component is good and then it might fail.

14 So, that's where it is not clear that you can use risk methods.

15 What we are recommending in this letter deals with
16 the consequences.

17 In other words, something goes wrong or somebody
18 attacks, we are not asking how the attack took place, we're
19 not asking how the fault in the digital case occurred, but
20 in order to lead to a the core damage event it has to follow
21 somehow the sequences.

22 So, by looking at the sequences, maybe we can

1 prioritize what the critical digital assets are and put some
2 order in the way we are focusing our attention the standard
3 PRA, risk informed approach that it helps us focus.

4 I think they are consistent.

5 One deals with the consequences, the other deals
6 with the actual occurrence of errors, which is something
7 that we don't really do very well these days.

8 CHAIRMAN JACZKO: I appreciate that and I think
9 that is helpful clarification.

10 I guess what I would take from that would suggest
11 that we can use in the case of the cyber it's more of a
12 conditional, or a way to compare and focus resources within the
13 cyber area, but not necessarily compare that or find whether
14 or not certain attacks would be acceptable or not
15 acceptable.

16 In that it would never get us to that point, and I
17 think that is helpful to clarify because I think that's an
18 issue we continue to struggle with licensees, their desire
19 to want to move in that direction, and I think given the
20 nature of the attach, both not only in cyber but in all
21 security aspects those similar kinds of challenges may
22 exist.

1 I appreciate that and again, I just want to say this is
2 always a very useful meeting for the Commission and we
3 always appreciate all of your insights and the hard work
4 that you and that you put in.

5 We look forward to more continued dialogue and
6 more letters and certainly appreciate your interactions with
7 the staff, and the staff's dialogue with you and I think
8 with that we are adjourned.

9 Thank you.

10 (Whereupon, the meeting was adjourned)

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