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Safeguards (OPEN SESSION)

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

November 14, 2007

The contents of this transcript of the proceeding of the United States Nuclear Regulatory Commission Advisory Committee on Reactor Safeguards, taken on November 14, 2007, as reported herein, is a record of the discussions recorded at the meeting held on the above date.

This transcript has not been reviewed, corrected and edited and it may contain inaccuracies.

1 NRC STAFF PRESENT:

2 BENJAMIN PARKS

3 DIANE JACKSON

4 PETER YARSKY

5 JOSE MARCH-LEUBA

6

7 ALSO PRESENT:

8 GRAHAM WALLIS, former ACRS Chairman

9 CHRIS HOFFMAN

10 RALPH GRUMMER

11 DOUG PRUITT

12 MIKE GARRETT

13 JAMES WILLIAMS

14 CHESTER LEHMANN

15 YOUSEF FARAWILA

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

6:37 p.m.

1
2
3 CHAIR BANERJEE: Okay. Let's do the
4 usual. Jack, why don't we start with your remarks?

5 MEMBER SIEBER: Well, I think the first
6 few topics went pretty well. Neutronics methods
7 assessment and validation; void fraction correlations;
8 and thermal-mechanical response; bypass voiding, I
9 think we struggled a little bit. I wasn't convinced
10 that we had solid calculational grounds for the kinds
11 of things that we were saying. And on the other hand,
12 there is some question in all of these topics what the
13 staff can do, for example, if you are beyond the
14 design basis like the ATWS situation, that the staff
15 can't bring you under the conditions for design basis
16 and expect you to meet the design basis outcome.

17 And I think there was a couple of topics
18 that had that aspect to it. You really can't find the
19 right regulation to make a licensee do something. On
20 the other hand, I think, you know, for example, in the
21 bypass voiding, we could have come up with a better
22 explanation.

23 Overall from the regulatory standpoint, I
24 didn't see anything that happened today that would
25 prevent the staff from doing that, approving that. On

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1 the other hand, I do think that some topics were more
2 precise explanation.

3 CHAIR BANERJEE: Let me ask you and this
4 is something I think each one of you need to give us
5 some feedback also to Areva. It deals with some of
6 the uncertainties with the gamma scan data, etcetera.
7 The staff and the licensee have agreed on a certain
8 penalty for the SLM CPR. With regard to the void
9 effect, the licensee showed that there were two
10 counter, what do I call it, weight phenomena going on,
11 so that the overall effect on things like OPRM CPR
12 were negligible.

13 MEMBER SIEBER: The same, yes.

14 CHAIR BANERJEE: Yes, so it came out as a
15 wash. They have clarified a lot of things, but from
16 a mechanical response, I don't know if we got a clear
17 answer about that or not in transient. That would be
18 something that we need to talk about. And then with
19 bypass voiding, to take care of the uncertainties and
20 the lack of modeling, the licensee and the staff have
21 agreed on an approach where they will put a penalty on
22 the setpoint that triggers the scram using the OPRM
23 signals.

24 MEMBER SIEBER: It's a good fix as far as
25 -- if the penalty is right.

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1 CHAIR BANERJEE: Yes. So the issue really
2 is to keep it relatively simple, let's discuss, and I
3 think any of you should jump in here, whether you
4 agree with these approaches and with the conclusions,
5 so that we have a coherent story to tell the full
6 Committee that this is going to be sort of the
7 approach that the staff is taking with the SLM CPR to
8 take care of this problem.

9 We are not going to put anything on the
10 OLM CPR, because we think that counteracting effects
11 which cancel each other and we are convinced that
12 that's true. I don't know if they are not, speak up.
13 Then we are going to say that the thermal-mechanical
14 effects, I still don't know whether -- what the story
15 is going to be there. Bypass voiding, there is going
16 to be a straightforward sort of penalty put, whether
17 we agree with that or not we should say and with ATWS
18 instability a certain disposition has been proposed
19 and we'll talk about that.

20 So I think if we could just focus and
21 address these issues and give the guidance back, then
22 we can -- so do you agree, Jack, with all these items?

23 MEMBER SIEBER: I think your discussion of
24 the items and the proposed way to disposition them is
25 accurate. And I don't -- I think that probably that

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1 is the best way to dispose of most of these issues.
2 On the other hand, when there is not a calculational
3 basis for statements that are made, I think that
4 should be fortified with some additional work.

5 CHAIR BANERJEE: Okay. So the areas where
6 more calculation on the basis probably was required
7 seems to me that, at least to me appear to be, perhaps
8 a little bit on the thermal-mechanical response.

9 MEMBER SIEBER: Right.

10 CHAIR BANERJEE: Maybe ultimately on
11 bypass voiding, but it wasn't -- with that penalty
12 maybe it wasn't such a big issue right now and the
13 penalty wasn't very big. And then with ATWS. So
14 let's -- we either accept what we have done or not,
15 because there is going to be new calculations done in
16 the short-term.

17 MEMBER SIEBER: Right.

18 CHAIR BANERJEE: From what I can see.

19 MEMBER SIEBER: That doesn't necessarily
20 reflect this plant.

21 CHAIR BANERJEE: It doesn't reflect.
22 Okay.

23 MEMBER ABDEL-KHALIK: I am sort of pleased
24 that the applicant has taken the approach that they
25 are going to go ahead and try to estimate the bypass

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1 voiding by doing a calculation. What needs to be done
2 is to sort of think through the process and make sure
3 they are using a single bypass void -- a single bypass
4 calc -- channel will actually produce a bounding
5 estimate for this penalty. And whether that -- you
6 know, any radial distribution vis-a-vis, the average
7 radial value that you will get by using a single
8 bypass channel is going to produce a higher penalty,
9 that's what we need, too. So you just need to
10 convince yourself and convince, you know, people who
11 will understand what you are doing that this will
12 actually give you a bounding estimate for the penalty.

13 CHAIR BANERJEE: Well, I think that would
14 be one of the things that needs to be made quite
15 convincing to the full Committee then.

16 MEMBER ABDEL-KHALIK: Right.

17 CHAIR BANERJEE: I think we have good
18 arguments right now, but they need to be marshaled and
19 delivered in a very short time, very quickly.

20 MEMBER ABDEL-KHALIK: The second thing is
21 that, you know, as far as ATWS instability, I am still
22 not very comfortable with heuristic arguments. I do
23 understand that the purpose of the simulated
24 demonstrations was to show that the operators can
25 respond within a reasonable time, but still I would

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1 like to see some analysis done if that is at all
2 possible.

3 CHAIR BANERJEE: Graham?

4 MR. WALLIS: Well, I think Susquehanna has
5 been responsive to the questions we have and one can
6 always go and ask for more and more and more and more.
7 I mean, convince me yet again some more. And I felt
8 that I was -- the things that I looked into in some
9 detail, like the void effects and so on, I think they
10 did an adequate job. On the bypass voiding, I didn't
11 really study that until I came here enough to know
12 whether it's adequate or not. So I'm a little
13 uncertain about that one.

14 On the ATWS, I really feel that I'm not
15 competent to judge all this heuristic stuff without
16 having a much better feel for what it all means. So
17 I would have to somehow understand much better these
18 arguments about the friction here and there. It
19 didn't put together an argument that convinced me, but
20 maybe it convinced -- maybe it's convincing enough
21 when you understand enough about it.

22 I wouldn't -- if I were the staff, I would
23 be reluctant to say it's okay.

24 CHAIR BANERJEE: There is another approach
25 and this is something which I would like to just dance

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1 around. I mean, there have been heuristic arguments
2 made. We have analyses of ATWS which are available to
3 the staff and to us. It can be that those could be
4 examined to see if these heuristic arguments hold
5 water or not.

6 MEMBER SIEBER: Right.

7 CHAIR BANERJEE: Well, that gives us added
8 level of assurance. But let's take that up in a
9 little while. Sam?

10 MEMBER ARMIJO: Well, I agree with
11 everything that has been said up to now. As far as
12 the ATWS instability, I think the arguments are sound.
13 They are going to take mitigating actions unless there
14 is some reason to believe that you can -- it wouldn't
15 work or you wouldn't have enough time. I don't know
16 what else they can do. I don't know what else staff
17 would require.

18 All the penalties look reasonable. The
19 absolute values of those penalties, I think that's
20 really properly the staff's job. In the thermal-
21 mechanical response, my issue is that I think the very
22 narrow view of the threats to the fuel in the event of
23 a whole core transient, not steady-state operation,
24 but I think limiting that to fuel temperature and very
25 large cladding strains is I think just a little just

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1 too narrow and it wouldn't -- and I think tools are
2 available where the licensee or the staff could do a
3 quick analysis and say hey, look, this is not much of
4 a threat or they may find there is a threat to having
5 a lot of fuel failures.

6 And basically, I know it's not regulatory,
7 but I think it would be a great embarrassment to the
8 system, including ourselves if something happened and
9 we failed a lot of fuel and we didn't -- hadn't
10 analyzed for that phenomenon.

11 CHAIR BANERJEE: Sam, what do you think
12 should be done in time for the full Committee meeting?
13 We're going to have to have a letter from this
14 Committee.

15 MEMBER ARMIJO: I would have to think
16 about it a little bit more. I know what I would do if
17 it -- if I were a licensee, I would run a code. I
18 would run a FALCON code or such an event, unless
19 somebody can say hey, look, there is no whole core
20 transient that is ever going to last more than 2
21 minutes or 3 minutes or 10 minutes, give me a number,
22 without being terminated by a scram. And you know, if
23 that's the case, then I don't have an argument. I'm
24 just happy.

25 MEMBER SIEBER: But ATWS doesn't happen

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1 that way.

2 MEMBER ARMIJO: Well, there's too many
3 variables.

4 CHAIR BANERJEE: ATWS is outside this.

5 MEMBER ARMIJO: Yes, ATWS is outside the
6 design basis. So that's the only part where I'm
7 uncomfortable. I think all the other stuff --

8 CHAIR BANERJEE: Anticipated transients,
9 if they cause any major issues with the fuel.

10 MEMBER ARMIJO: That aren't the classic
11 things we analyze all the time.

12 CHAIR BANERJEE: Yes.

13 MEMBER ARMIJO: Just don't -- you know,
14 we're trying not to be surprised in this industry and
15 we know there is a failure mechanism out there that is
16 currently under control. I just want to make sure
17 that somebody keeps an eye on it, so it doesn't come
18 and bite us.

19 CHAIR BANERJEE: All right. Mario?

20 MEMBER BONACA: I was pretty close with
21 the thoughts that Graham is expressing and I think
22 that between the penalties they have accepted and some
23 of the work they are planning to do for the void
24 fraction, I think that they have addressed the issues.
25 I don't feel uncomfortable with this application.

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1 For the ATWS, again, I mean, there is no
2 specific regulatory expectation for the outcome of
3 ATWS without operator intervention. I mean, it's
4 simply an unacceptable condition for which there is no
5 expectation, except there is an expectation that you
6 implement certain steps to contain the event and to
7 control it. And, you know, we have had more than
8 other applications where either they are permitted to
9 go back to the simulator or members have gone there,
10 they have looked over what happened. They develop
11 significant confidence in the response ability of the
12 operator.

13 CHAIR BANERJEE: But you did more than
14 just ATWS, right?

15 MEMBER BONACA: Yes.

16 CHAIR BANERJEE: You did other actions.
17 Did you go too?

18 MEMBER BONACA: No, I didn't. But again,
19 I think that although it would be interesting to see
20 it, but the treatment of the ATWS event and see how
21 similar it would be or different from an ATWS from the
22 current power level. I don't think it's a regulatory
23 requirement that place the burden on the licensee. So
24 I must say that I'm satisfied for what they have.

25 Insofar as what we should present to the--

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1 well, I think that's the way I would present it also
2 to the Committee, because the Committee is familiar
3 with the previous applications and that's really what
4 the potential has been and I think it be for the
5 licensee here. Insofar as the presentation in
6 general, it would have to be certainly less focused on
7 thermal-hydraulics portion.

8 CHAIR BANERJEE: Well, we dealt with the
9 other issues. These are the only remaining issues
10 that need to be dealt with at the full Committee
11 meeting.

12 MEMBER BONACA: Yeah.

13 CHAIR BANERJEE: I don't know how much
14 time we have scheduled? Do we have that?

15 MS. ABDULLAHI: Two hours.

16 CHAIR BANERJEE: Two hours. So I think
17 that is more than enough.

18 MS. ABDULLAHI: At least I requested two
19 hours.

20 MEMBER BONACA: Yes, but I'm saying that
21 then this portion here would have to take a much
22 narrower slice of it as well.

23 MEMBER MAYNARD: Okay. But didn't we meet
24 with the full Committee on the majority of them?

25 CHAIR BANERJEE: Yes, that's what I'm

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1 saying.

2 MEMBER MAYNARD: So this next Committee
3 should be --

4 CHAIR BANERJEE: It is only remaining
5 issues on the table.

6 MEMBER MAYNARD: Yes, okay. Right.
7 You're right.

8 CHAIR BANERJEE: So we won't revisit the
9 other issues.

10 MEMBER MAYNARD: You're right.

11 CHAIR BANERJEE: I think that --

12 MEMBER SIEBER: Please, don't.

13 CHAIR BANERJEE: Yes, yes. As far as I'm
14 concerned, I mean, unless somebody wants to bring it
15 up.

16 MEMBER MAYNARD: Yes, anything is fair
17 game.

18 CHAIR BANERJEE: And that will come up
19 when we have the letter in front of us, I think. I'm
20 sure the staff will be there at that point. Okay.

21 MEMBER BONACA: I had some -- a few
22 questions that are important at this stage and I may
23 raise them during the full Committee meeting actually.

24 CHAIR BANERJEE: Well, you might want to
25 give them warning.

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1 MEMBER BONACA: One of the issues being,
2 you know, I would have liked to hear about the
3 internals of this plan. I don't believe that -- I
4 believe that probably several internals have cracks in
5 them and yet, when I look at the internal section of
6 the SER, there is no mention of that.

7 CHAIR BANERJEE: They now have it.

8 MEMBER BONACA: They do?

9 CHAIR BANERJEE: Yes, there is --

10 MEMBER BONACA: Okay.

11 CHAIR BANERJEE: I think if you really
12 reread it --

13 MEMBER BONACA: I have read the section.

14 CHAIR BANERJEE: -- you might find it.
15 Yes.

16 MEMBER BONACA: Okay.

17 CHAIR BANERJEE: Some treatment.

18 MEMBER BONACA: So it's being dealt with
19 already?

20 CHAIR BANERJEE: Yes. Of course, you are
21 perfectly --

22 MEMBER BONACA: Well, just because I'm not
23 comfortable in ignoring them. I mean, if you have
24 cracks and you claim that you have stabilized them at
25 the current power level, I would like to hear that

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1 going 20 percent power, uprate power maybe will
2 increase vibrations and other effects that they could
3 discuss. The expectation is that the cracks are
4 stabilized. And what is the basis for it?

5 CHAIR BANERJEE: The SER now has a
6 discussion of this, right, of cracks?

7 MR. GRUMMER: Specifically --

8 CHAIR BANERJEE: I thought I read
9 something.

10 MR. GRUMMER: The version that was
11 provided in this last go-around updates --

12 CHAIR BANERJEE: But even in the previous
13 version, it had something on it.

14 MR. GUZMAN: I'm sorry, Rich Guzman.

15 CHAIR BANERJEE: We can look.

16 MR. GUZMAN: I don't believe that was the
17 intent in the last update of the SE, but I would have
18 to know exactly which SE you are referring to.

19 CHAIR BANERJEE: I'm referring to not the
20 current version, but the one which was there when we
21 presented to the full Committee. That SE, I thought,
22 already had stuff on cracks.

23 MR. GUZMAN: That is correct, yes.

24 MEMBER BONACA: In general, my point is
25 that this is an older plant. It's not brand new and

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1 operating experience should be an element of the
2 evaluation or at least presented as a basis for
3 establishing why in certain cases evaluation only
4 questions original criteria and they are not affected
5 and the margin is supposed to remain there. And why--
6 and what other things may be affected by the aging of
7 the plant?

8 There is no mention of it anywhere. You
9 know, if you look at the evaluation, it deals with the
10 plant as it is now.

11 MEMBER ARMIJO: I think I read and I don't
12 know if it was in the most recent version, there was
13 something in -- related to PP&L adjusting hydrogen
14 water chemistry to provide an appropriate level of
15 protection for the internals in view of the higher
16 power operation and the core.

17 MEMBER BONACA: Yes, it talks about --

18 MEMBER ARMIJO: So --

19 MEMBER BONACA: -- resolution of elements.

20 MEMBER ARMIJO: Well, you know, it's the
21 expectation that if hydrogen is stopping cracks from
22 growing.

23 MEMBER BONACA: We get to the point where
24 there is almost a belief that cracks are good, because
25 they stabilize them.

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1 MEMBER ARMIJO: I don't believe that.

2 MR. WALLIS: They are for you, Sam.

3 MEMBER ARMIJO: Not me.

4 MR. WALLIS: What I said there, since you
5 mentioned the SER, I think that not only has the
6 applicant come back and responded to our questions,
7 but the staff has. It didn't say that, but, you know,
8 the SER has changed significantly for the better in
9 certain areas. And I think that's due to the stimulus
10 that we have -- the Subcommittee gave them.

11 CHAIR BANERJEE: Maybe.

12 MR. WALLIS: They have responded well.
13 Otto?

14 MEMBER MAYNARD: Well, I am kind of afraid
15 to make a qualitative statement.

16 MEMBER SIEBER: You should be.

17 CHAIR BANERJEE: You risk it.

18 MEMBER MAYNARD: But there's no way I
19 could do another analysis and calculation on these
20 issues.

21 CHAIR BANERJEE: We're going to miss happy
22 hour anyway, so you can take your time.

23 MEMBER MAYNARD: Well, I agree with many
24 of the comments that have already been made. I
25 believe that both the NRC staff and the PP&L have been

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1 very responsive to our questions. We have asked a lot
2 of questions, dug into a lot of issues. I think that
3 they have tried to be very responsive and have done a
4 good job overall of doing that.

5 I believe that with the license condition
6 and with the additional work that the applicant has
7 agreed to do with the staff, that I believe that that,
8 in addition to what all they have done, does provide
9 the adequate assurance, you know, remember our
10 challenge is to provide reasonable assurance of
11 adequate health and safety of the public. And I
12 believe that it meets that requirement with the
13 license condition and some of the additional work to
14 be done.

15 I think that the margins that are being
16 established, while I can't judge whether they are
17 totally adequate or not, my experience has typically
18 been when we have set something like this that we
19 actually provide more margin, than if we went through
20 and spent all of the money, time and effort to do a
21 detailed calculation. Usually, these types of things
22 establish more margin than we would through the far
23 more rigorous analysis for this. So I'm comfortable
24 with that.

25 Again, on the ATWS, I think we need to

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1 keep in mind that that is a beyond design basis
2 accident. I believe that there is adequate
3 justification showing that we end up in the same
4 point. So I think we have to ask ourselves are we
5 really challenging the EPU aspects of this or are we
6 really challenging what the current license is?

7 Our task is to take a look at the
8 effective EPU. And I believe that the arguments are
9 there for this EPU, that gets you to the same
10 conditions. And so I personally don't believe that
11 there is a need to require them to do any more
12 analysis. Again, I think MELLLA+ operating in that
13 region is a totally different question and I would not
14 have necessarily the same views with that.

15 I think all the rest of it has been said.
16 I do think it's important that we, before we leave
17 here tonight, give both the staff and the applicant a
18 good idea of what we really want to talk about at the
19 meeting coming up.

20 CHAIR BANERJEE: Sure, absolutely. We
21 must do that. Yes?

22 MEMBER CORRADINI: I think I guess I agree
23 with Otto. I agree with many things he said. Just to
24 go down the list, the neutronics methods assessment
25 and void fraction correlations, I think I would agree

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1 with the approach they have taken. And their
2 modifications to their MCPR relative to that.

3 For the thermal-mechanical response, I
4 guess I was -- I had been listening to what Sam was
5 saying before and I guess if I were in their shoes,
6 that is the applicant, I might do some calculations
7 and get some information. It's not a safety issue,
8 but it's important relative to the performance of the
9 plant and it benefits them, not necessarily from a
10 safety standpoint, but it could eventually benefit
11 them in other ways.

12 For the bypass voiding, I guess I feel
13 good given what they have committed to relative to
14 their calculation. So I don't really have anything
15 there.

16 In the ATWS instability, I went back to
17 read the letter from a previous review just to make
18 sure I've got it right. So I think we gave caution in
19 a past review of this that it had to be manual, some
20 sort of operator actions to do it. And I think that's
21 the key. So I guess if I were to task the staff with
22 something, which is to get a clear picture of what
23 they think relative to the operator time and if the
24 applicant has demonstrated with these conditions, that
25 they can, essentially within a given time, do the

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1 actions they need to, essentially, mitigate.

2 Because without that, no matter what
3 calculation we do, although I might -- calculations
4 always help a little bit. I would think that it still
5 wouldn't be acceptable. As for the meeting in
6 December when we have to do this, I guess since we
7 have already covered this, I remember discussing it in
8 November, I guess I think the staff ought to go
9 through this in a fashion which, essentially, gets to
10 the bottom line about the licensing conditions that
11 are going to make a change.

12 CHAIR BANERJEE: Yes.

13 MEMBER CORRADINI: And then clearly we're
14 going to have discussions, they should be ready. I
15 wouldn't necessarily offer them to make a
16 presentation. They should just be ready, because they
17 will get the questions, particularly relative to the
18 thermal-mechanical response of bypass voiding and the
19 ATWS instability, because others will have questions.
20 And then given that, it probably would proceed in a
21 more efficient manner.

22 CHAIR BANERJEE: David?

23 MR. DIAMOND: All right. I will repeat
24 some of the same things that have already been said
25 just to explain what my perspective is. Starting with

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1 the neutronic methods, I think that the staff has done
2 an excellent job in their review, something which came
3 out this round and not in the previous round, and I
4 would agree with the approach that they took to impose
5 a penalty, the particular penalties that they did
6 impose. And also, agree with their thinking behind
7 the quantifying of that penalty. It wasn't -- it
8 certainly was -- an engineering judgment was involved,
9 but I think it was a good engineering judgment. So I
10 think that was a good piece of work by the staff.

11 Let me skip to the bypass void, which I
12 think will be resolved through the analysis that the
13 licensee will do and also, it sounded as though the
14 staff may also be doing some analysis. And the only
15 thing that I would caution is that although a portion
16 of that analysis has already been identified as being
17 conservative, one has to look at all the assumptions
18 that are going into that analysis, just to make sure
19 that you are not throwing in some non-conservative
20 assumptions.

21 And Said, I think, has made this point
22 again and again about just the radial distribution of
23 the bypass void being a factor and, you know, what
24 does that bring to the penalty. With regard to ATWS,
25 I would just repeat that I think that the EPU

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1 operation and the EPU zone does not change things
2 relative to previous operation of the plant with
3 regard to ATWS instability.

4 Now, there is this other question of
5 whether we have done the right regulatory things with
6 regard to ATWS instability in the past. And some of
7 that is based on looking at analysis which the ACRS
8 has not looked at and which probably they should look
9 at in the future, because it's a very difficult
10 analysis to do.

11 And proving that you have core coolability
12 is predicated on making sure that your models are
13 appropriate and that you have sufficient time to take
14 actions. And as I say, that's a separate issue.
15 Maybe the Committee can get into it when it comes up
16 with respect to MELLLA+, because it is certainly more
17 critical when you go to MELLLA+ than it is when you
18 remain on the MELLLA line.

19 So that I don't think has to do with
20 approval of the EPU, but I think it's something that
21 the Committee, the full Committee should be made aware
22 of that ATWS is something that should be looked at.

23 CHAIR BANERJEE: Okay. Thanks, David.
24 Let me try to summarize, if I miss anyone of my
25 colleagues, please, call me up. First of all, we want

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1 to focus during the full Committee meeting on the
2 issues that were raised.

3 COURT REPORTER: You need to turn towards
4 the mike I think.

5 CHAIR BANERJEE: Sorry. Well, I'll speak
6 with my back there. I guess I'm comfortable speaking
7 with my back to you. I think the first thing is that
8 we should limit the discussion at the full Committee
9 meeting to the issues that were on the table today.
10 And we should not revisit any of the issues that we
11 had already dealt with. I think, as far as I'm
12 concerned, we have adequately dealt with them up to
13 now.

14 Okay. So the points here I would like to
15 sort of consider first is the revisions to the SER
16 with regard to neutronic methods and the associated
17 safety margins and so on that were added, were very
18 well done, I thought. And the staff really did an
19 excellent job with the SE and should be complimented
20 on responding so well.

21 I think that perhaps a little bit more
22 discussion of the margin that was put on should be
23 probably made at the full Committee meeting, because
24 things were not completely clear. From the point of
25 view that we put a very different SLM CPR margin on

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1 Vermont Yankee and I'm sure that there will be Members
2 of the Committee who will want to know why and maybe
3 that we would have to have that discussion without
4 Areva and without PPL even. But we might have to have
5 that discussion. So I'm sure you have got clear
6 reasons for it, but we should know why that was done.

7 With regard to the void fraction
8 correlation effects, again, it was nice that both PPL
9 and the staff responded to well to our comments
10 earlier. It seems that there are sort of effects
11 which cancel each other out, so that there are no
12 penalties needed associated with the uncertainties in
13 the void fraction correlation. This is a relatively
14 new finding and I think it needs to be supported a
15 little more completely, because we have, in previous
16 times, put penalties or margins on OLM CPRs and they
17 may not be justified in the light of what we have
18 found out today.

19 If they are not, then we should certainly
20 revisit that for several other places where we have
21 actually put those margins on. Okay. And the
22 interesting point today was it was done with two
23 codes, but I still have -- I mean, two correlations
24 which were different. I personally still have some
25 reservations about that.

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1 It would be different if you took a single
2 correlation and changed the slip ratio, so that you
3 went from homogeneous to almost separated flow and you
4 got that result. I would buy that. This is a little
5 bit harder to buy. Okay. So I don't know what
6 message that is sending to you, but at least that's
7 the uncomfortableness that I have with that.

8 Okay. With regard to the thermal-
9 mechanical response, I'm sure this issue will lead to
10 quite a bit of discussion at the Committee, so how one
11 presents it and how one deals with it, I think you
12 will have to figure out. But you know that Sam has
13 significant concerns about this and I think the rest
14 of the Subcommittee also would like to see some sort
15 of acceptable sort of response to this, so that we can
16 feel comfortable going ahead with this with our
17 recommendation.

18 Bypass voiding, I know this is going to be
19 very difficult to handle and the type of approach you
20 have taken, I think, is the best that can be done
21 right now. And certainly the margin that you have put
22 on appears to be sufficient. So I got the feeling
23 from the Members here that while it would be nice to
24 do the modeling better, I think what has been done is
25 acceptable. Certainly acceptable right now. And

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1 that's what I feel.

2 With regard to ATWS instability and ATWS,
3 is a little bit of a tougher call, didn't really see
4 any calculations which showed we would end up at the
5 same point. We have heard qualitative arguments as
6 pre-CPPU and post-CPPU. I don't think, however, that
7 you have enough time to make more than any qualitative
8 arguments at the moment. So whatever support you
9 could bring from previous quantitative analyses that
10 are available to you, because this is not the first
11 time that we have done an EPU, maybe with different
12 fuel we have done EPUs, but we have done EPUs.

13 Again, if the staff wants to close the
14 session to Areva and show us that this is what we have
15 found in previous EPUs, that would be very useful.
16 And I think with our Members having visited
17 Susquehanna and having seen the performance of the
18 operators, this is an added level of assurance that
19 actions can be taken in time, because it's clear that
20 ATWS is unacceptable consequences.

21 And, therefore, it's going to be how you
22 mitigate these actions that will come up. So from
23 that point of view, if it was presented in a clear
24 way, so that it was shown that the EPU didn't make
25 such a big difference compared to what we currently

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1 license, do we have an acceptable approach there for
2 ATWS?

3 So I think by and large, it should be
4 fairly smooth sailing. You never know with the full
5 Committee, of course, whether it will be smooth
6 sailing, but my feeling of the sense of the
7 Subcommittee is that the Subcommittee, except for a
8 couple of issues here and there, are satisfied. And
9 these issues really are tough calls right now, because
10 we may not have the tools to do anything, so we're
11 going to have to make a judgment on these.

12 MR. WALLIS: On your point about the two
13 codes, that they showed with Dix-Findlay are up here
14 and with the other one you are here, so I sort of
15 thought that it's the same thing as twiddling at Dix-
16 Findlay a little bit to make it move sideways. So
17 sensitivity to Dix-Findlay is kind of captured by
18 having the fact that the one code is parallel to it.
19 It's almost the same.

20 CHAIR BANERJEE: Well, perhaps it is
21 right, but, you know, this slight of hand that baffles
22 the eye in these things a little bit, I like to get
23 these just really straightforward. They just crank
24 the stiff coefficient and you get -- I'm sure that
25 within Dix-Findlay you can change things.

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1 MR. WALLIS: I can predict a lot of things
2 to crank inducing.

3 CHAIR BANERJEE: A lot of things to crank.
4 You can crank it, I'm sure. At any rate, so thank you
5 and again, I would like to thank PPL and Areva and the
6 staff for excellent presentations and your
7 responsiveness. Done.

8 (Whereupon, the meeting was concluded at
9 7:15 p.m.)

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CERTIFICATE

This is to certify that the attached proceedings before the United States Nuclear Regulatory Commission in the matter of:

Name of Proceeding: Advisory Committee on
Reactor Safeguards

Docket Number: n/a

Location: Rockville, MD

were held as herein appears, and that this is the original transcript thereof for the file of the United States Nuclear Regulatory Commission taken by me and, thereafter reduced to typewriting by me or under the direction of the court reporting company, and that the transcript is a true and accurate record of the foregoing proceedings.



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