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Regulatory Policies and Practices  
Station Blackout and Related Regulation

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

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REGULATORY POLICIES AND PRACTICES SUBCOMMITTEE

STATION BLACKOUT AND RELATED REGULATION

+ + + + +

WEDNESDAY

DECEMBER 5, 2012

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ROCKVILLE, MARYLAND

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The Subcommittee met at the Nuclear  
Regulatory Commission, Two White Flint North, Room  
T2B1, 11545 Rockville Pike, at 8:30 a.m., William J.  
Shack, Chairman, presiding.

COMMITTEE MEMBERS:

WILLIAM J. SHACK, Subcommittee Chairman

J. SAM ARMIJO, Member

DENNIS C. BLEY, Member\*

CHARLES H. BROWN, JR. Member

MICHAEL L. CORRADINI, Member

DANA A. POWERS, Member

1 HAROLD B. RAY, Member  
2 JOY REMPE, Member  
3 MICHAEL T. RYAN, Member  
4 STEPHEN P. SCHULTZ, Member  
5 JOHN D. SIEBER, Member  
6 GORDON R. SKILLMAN, Member  
7 JOHN W. STETKAR, Member

8  
9 NRC STAFF PRESENT:

10 EDWIN M. HACKETT, Executive Director  
11 CHRISTINA ANTONESCU, Designated Federal  
12 Official  
13 JOHN H. FLACK, Consultant  
14 JIM ANDERSEN, NRR/DE/EEEB  
15 ERIC BOWMAN, NRR/DPR/PGCB  
16 MIKE CHEOK, NRR/DE  
17 MATT MCCONNELL, NRR/DE/EEEB  
18 TIM REED, NRR/DPR/PRB  
19 ROBERT WEISMAN, OGC

20

21

22 \*Present via telephone

23

24

25

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

8:30 a.m.

CHAIRMAN SHACK: This is a meeting of the Regulatory Policy and Practices Subcommittee. I'm Bill Shack, Chairman of the Subcommittee.

ACRS members in attendance are Harold Ray, Charles Brown, Mike Corradini, Dana Powers, Mike Ryan, John Sieber, Joy Rempe, Dick Skillman, Steve Schultz. Christina Antonescu is the ACRS - of the ACRS staff who's the designated federal official for this meeting.

The Near Term Task Force recommended that SBO mitigation capability at all operating and new reactors for design basis and beyond design basis external events be strengthened.

They proposed that rule making be undertaken to provide a capability to cope with extended loss of AC power using a combination of installed equipment to provide for core and spent fuel pooling and for reactor coolant system and primary containment integrity.

The staff issued an advance notice of proposed rule making to address these issues. However, they have also issued an order, EA-12-049, that required licensees to develop strategies capable

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1 of mitigating a simultaneous loss of all AC power and  
2 loss of normal access to the ultimate heat sink due to  
3 beyond design basis external events.

4 This is also to have adequate capacity to  
5 address challenges to core cooling, containment and  
6 spent fuel pool cooling capabilities.

7 It must be able to obtain sufficient  
8 offsite resources to sustain these functions  
9 indefinitely. The staff has accepted NEI 12-06 and  
10 the FLEX strategy is an acceptable method for  
11 developing the strategy required by the order.

12 During this meeting, the staff will  
13 describe the status of the staff's rule making efforts  
14 and how their thinking has evolved since the issuance  
15 of the order.

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

20 The rules for participation in today's  
21 meeting have been announced as part of the notice of  
22 this meeting previously published in the Federal  
23 Register on November 15th, 2012.

24 We have received no written comments or  
25 requests for time to make oral statements from members

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1 of the public regarding today's meeting. Also, we  
2 have no requests for the bridge line phone connection  
3 to listen to the discussions.

4 To preclude interruption of the meeting  
5 the phone will be placed on a listen-in mode during  
6 the discussions, presentation and committee  
7 discussions. And I think Mike Cheok's going to lead  
8 us off.

9 MR. CHEOK: Thank you. Good morning. My  
10 name is Mike Cheok and I'm the Deputy Director for the  
11 Division of Engineering and NRR. It's good to be back  
12 to address the ACRS again.

13 CHAIRMAN SHACK: It's been a while.

14 MR. CHEOK: Yes, it's been. This morning  
15 we will talk about our efforts to date on  
16 recommendation 4.1 of the Near Term Task Force lessons  
17 learned report.

18 This recommendation is to strengthen  
19 station blackout, mitigating capability and operating  
20 and new reactors for design basis and beyond design  
21 basis external events.

22 In October of last year, the Commission  
23 directed the staff to initiate rule making in this  
24 area with the goal of completion of within 24 to 30  
25 months of the staff requirements memorandum. This is

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1 an aggressive schedule and the staff's working real  
2 hard to try to meet the schedule.

3 Since last October, we have obtained  
4 industry and external stakeholder comments to the  
5 advanced notice of proposed rule making process and we  
6 have also conducted a public meeting to discuss issues  
7 related to the effort.

8 We are currently in the process of  
9 developing the regulatory basis for the rule and also  
10 the proposed rule language. We have requested this  
11 ACRS briefing because we are interested in hearing  
12 your thoughts on this process.

13 Tim Reed is the lead project manager for  
14 this rule making. Tim will provide some background on  
15 the Near Term Task Force recommendation as well as  
16 some key insights from the comments and from our work  
17 so far.

18 He will also talk about our current  
19 thinking on the framework for the rule making. At the  
20 end of the presentation Tim will discuss the next  
21 steps, the time line and future ACRS interactions.

22 I would like to introduce Eric Bowman to  
23 the far left. Eric is the lead project manager for  
24 the mitigating strategies order which is part of NTTF  
25 recommendation 4.2.

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1 Eric is here to discuss questions on the  
2 order and how it factors into our rule making process.

3 Along with Eric is Matt McConnell to my  
4 left, who is the lead for the electrical engineering  
5 branch. Matt will address questions related to the  
6 current station blackout rules.

7 With that, Tim?

8 MR. REED: All right. Thank, Mike. It's  
9 a pleasure to be in front of the ACRS again. It's  
10 been a long time for me. Quite a long time actually  
11 and -

12 CHAIRMAN SHACK: At least it's not a steam  
13 generator.

14 MR. REED: Yes, that's the 90s and then  
15 50.69 in the 2000s so it's been a long - been a long  
16 time.

17 As Mike said, the idea today is really an  
18 open interaction. That's a little different, I think,  
19 than the committee is used to. We really are  
20 interested in the opinions, your opinions, expert  
21 opinions.

22 (Laughter.)

23 MR. REED: And that's, you know, really I  
24 - you know, my idea was to come here now and at least  
25 so we can hear what you're saying and allows you to

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1 inform us - inform us going forward.

2 And, you know, the schedule right now  
3 we'll get to the last slide was to bring this whole  
4 package to you next year, next March and April and  
5 that would be the subcommittee and full committee.

6 By then you'd have the whole thing and  
7 this way we can get your input and hopefully we can -  
8 we can do something within four months and obviously  
9 put together a better product.

10 So that's the idea and it really is in  
11 that context that we're here today. So just to start  
12 with a little background, and I'm going to have a few  
13 slides here to try to get everybody baselined and now  
14 we're on the same sheet of music here and so we can  
15 all then have a discussion on what kind of - the core  
16 part of this whole thing - our insights and where  
17 we're at right now in this effort.

18 But as Mike mentioned, just now we've got  
19 our direction from the Commission last - in October of  
20 2011 to initiate this activity as an ANPR and at that  
21 time in the same SRM they also have a very, I think,  
22 insightful direction to follow an approach that's  
23 similar to what was done for B.5.b, which became 10  
24 CFR 50.54(hh)2 as part of the power reactor security  
25 rule making. That's where it ended up.

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1           Okay. So that's a - and that was really  
2           in the context when you're looking at beyond design  
3           basis, you know, events that you should - have a high  
4           level of space kind of approach similar to what was  
5           done there and that's exactly where we've been going  
6           the whole way with both the strategies order as well  
7           as this rule making as well.

8           We, of course, then followed that  
9           direction. We put together an ANPR that was put into  
10          the Federal Register on March 20th.

11          That was - you know, really the intent was  
12          to get stakeholder feedback to help us do this,  
13          really. ANPRs are not rule making.

14          They're really just tools to allow you to  
15          put together a regulatory basis and decide whether  
16          rule making as one of the options is the appropriate  
17          one.

18          Of course, in this particular circumstance  
19          we were directed to do rule making so that's kind of  
20          a moot point. So we're doing rule making, of course,  
21          but we really wanted the stakeholder feedback to help  
22          us do that and we had a very - if you looked at the  
23          ANPR it's kind of a brainstorming exercise, a question  
24          format.

25          It's very open. It was very much intended

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1 to get kind of any feedback that might help us do that  
2 and we did get 45 comment submissions and that was a  
3 lot of input. I think that's a good input and it's  
4 really helped us do our job.

5 And as part of that we had a open - a  
6 public category three meeting also where we interacted  
7 with the public and then external stakeholders to give  
8 them really our thoughts in a verbal format that what  
9 they saw in the Federal Register notice and that was  
10 intended to help the feedback be more informed and  
11 constructive and focused and help us do our job better  
12 to put together this framework, this new rule.

13 Okay. So that's kind of a background,  
14 just to get everybody on the ANPR and what that effort  
15 was, and then as Mike just mentioned the - this really  
16 stems from recommendation 4 and as part of the overall  
17 Near Term Task Force report and to my mind 4 is kind  
18 of the center of everything.

19 Every kind of - everything sort of  
20 revolves around 4 so I'm sure this committee is well  
21 aware many of the other Near Term Task Force  
22 recommendations are closely linked to us and most  
23 important to that, of course, is 8. But I'll get to  
24 that in a second.

25 We stem mostly from 4.1 and that's kind of

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1 the label that's been put on us - 4.1. I'm going to  
2 dispense with these labels here in a second, and the  
3 order is often called 4.2 and as you'll see in a few  
4 slides if you looked ahead, 4.2 was never really done.

5 The order became 4 and the rule making  
6 became 4. They're virtually overlapping and they're  
7 very broad and performance based.

8 And so it kind of turned into something  
9 different than what the NTTF recommended - in fact,  
10 something I think is much better.

11 Now, in terms of the other NTTF  
12 recommendations we also - as I mentioned, 8 is very  
13 closely linked to us because 8, if you're not familiar  
14 with that, I don't believe 8 - Bob Bell and 8 -  
15 they've been before the committee yet but 8 - that  
16 Recommendation 8 is an idea where they were looking at  
17 all these procedures and guidance that have been in  
18 place post-TMI.

19 EOPs, of course, are requirements. There  
20 were symptom-based EOPs put in place after TMIs,  
21 you're all aware. But we also have severe accident  
22 and management guidelines which are voluntary  
23 initiatives, okay.

24 We had extensive damage mitigation  
25 guidelines that were put in place to implement the

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1 B.5.b stuff and became 10 CFR 50.54 (hh)2 which Eric's  
2 an expert on and lead.

3 So we have these different sets of things  
4 out there and they're all treated a little differently  
5 and the handling is a little differently and the NTTF  
6 I think appropriately recognized that those things  
7 more handled in a consistent manner that there might  
8 be command and control issues, that there may be  
9 treatment issues.

10 You should handle these things really  
11 consistent and it was an idea, a sound idea, I  
12 believe, to address that and make that all, you know,  
13 basically addressed in one way.

14 Now, of course, for us we have another  
15 whole set of stuff and it's pretty extensive stuff  
16 called the mitigating strategies that's going to be  
17 thrown into that.

18 And so it makes very - a lot of sense that  
19 that would be dealt with in recommendation 8 in a  
20 manner consistent with this other stuff out there -  
21 the EOPs, SAMGs, DDMGs, okay. So that's why we're  
22 closely linked with that recommendation.

23 Nine point 3 is a - stemmed from the  
24 50.54(f) letters that we're also issued in March of  
25 this year and that's going to staffing and

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1 communications and, of course, staffing becomes a big  
2 deal in a situation like this.

3 You have enough staff to go out and take  
4 over a lot of mitigating actions. If you don't have  
5 the staff, obviously, you're not going to be  
6 successful so that was part of that request and, of  
7 course, communications issues both onsite and offsite.

8 When you have an extended alternating AC power it was  
9 a big deal.

10 So that's part of us being successful in  
11 mitigating strategies and it's actually built into the  
12 mitigating strategies guidance, you may or may not be  
13 aware. So that's actually part of our - directly part  
14 of our effort here.

15 Seven point one, the order on the spent  
16 fuel pool instrumentation, that's only the level  
17 portion of 7.1. That, of course, became EA-12-051.

18 That level of instrumentation also falls  
19 into what we do because we have a strategy, of course,  
20 to maintain and restore spent fuel pool cooling and so  
21 that level of instrumentation will be used and so that  
22 folds into our effort here. So that's directly  
23 related.

24 Five point one, reliable hardened vents  
25 for mark one and mark two containment, I'm sure you're

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1 familiar with that - that also folds into the  
2 containment function and mitigating strategy for those  
3 designs. So whatever happens to that will also have  
4 to be used as part of.

5 So these are the ones that most directly  
6 impact us but I have a bullet there at the end that  
7 says they kind of all affect us at one form or fashion  
8 and I'll give you an example.

9 The one that might concern me the most is  
10 2.1, and 2.1 for me is the root cause. I mean, it's -  
11 if you don't have a sufficient external dense design  
12 basis you need to revise that per an NTTF 2.1 and you  
13 do change that, that would have a huge, I think,  
14 direct impact on what we're doing in mitigating  
15 strategies and particularly the way we're reasonably  
16 protecting this equipment and we can get that to - a  
17 little bit down the road here.

18 But so the 2.1 is not on here but it would  
19 have a big impact. So I just want to give you a feel  
20 that we certainly are aware that all these  
21 connections.

22 It's made our job a little tougher but we  
23 are trying to, of course, maintain that interaction  
24 with all the other NTTFs and fold those into our rule  
25 making as we go forward.

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1           So that's just a really high level of  
2 baseline of where this thing fits in the NTTF. And by  
3 the way, feel free to stop me anywhere along the line  
4 - I'm sure you will - but I have a tendency to go too  
5 fast and talk too fast so -

6           MEMBER ARMIJO: I have a tough little  
7 question. We have an existing station blackout rule  
8 and I'm sure it has words in it that address all of  
9 these things to some degree and maybe some of these  
10 things not at all.

11           What I'd like to hear is with the existing  
12 station blackout rule where are the big deficiencies  
13 that are going to be corrected with this ruling.

14           MR. REED: I'm going to get to that  
15 probably in 10 and 11, I think, later on. If you'll  
16 hold on that we'll definitely get that.

17           MEMBER ARMIJO: Okay.

18           MR. REED: If we don't, of course, hit me.  
19 But I'm pretty certain because I have the electrical  
20 branch folks here and we'll do that.

21           MEMBER ARMIJO: Yes, there's so many  
22 things here that we're addressing in other areas that  
23 some - I just want what's unique about the station  
24 blackout rule. Is it supposed integrate -

25           MR. REED: Yes.

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1 MEMBER ARMIJO: - all of these issues into  
2 one big -

3 MR. REED: Actually, it's in the rule  
4 making space when you try to put something in the Code  
5 of Federal Regulations as a starting point you got to  
6 be mindful of what's already in there, all right, and  
7 there are two sets of requirements in there that we  
8 have to be mindful of them.

9 50.63 is the one that comes to mind  
10 immediately is also all AC power from 1988. But  
11 actually 50.54(hh)2 is in there too and we touch upon  
12 - we can hit those too.

13 So there's two different sets and we have  
14 to worry about the part 50 stuff as well as new  
15 reactors. So it's a challenge. Definitely aware of  
16 it and we'll get to that here in a second on how we -

17 MEMBER ARMIJO: Yes, because I'm a little  
18 confused in that there's this NUREG-1776 which  
19 reviewed the regulatory effectiveness of the existing  
20 station blackout rules, concluded it was very  
21 effective.

22 MR. REED: Yes.

23 MEMBER ARMIJO: So, obviously, it's not  
24 effective enough if we're doing all of this stuff and  
25 what I'd like to know where the areas where Fukushima

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1 told us we had problems.

2 MR. REED: Sure. We'll look at that and  
3 we'll try to hit those slides, okay.

4 MR. CHEOK: And I think in one - in one  
5 sentence what they were looking for is just the coping  
6 capability - to increase the coping capacity of the  
7 station blackout rules - that name.

8 MEMBER ARMIJO: That's the main objective  
9 pretty much.

10 MEMBER CHEOK: Okay.

11 MEMBER ARMIJO: That's the mandated eight  
12 hours, right?

13 MR. REED: I'm sorry?

14 MEMBER ARMIJO: That's the mandated eight  
15 hours, right?

16 MR. CHEOK: That's not - that's not quite  
17 a mandate but that's - one of the general mandate was  
18 to make sure that we can cope with external events to  
19 the extent practical.

20 MEMBER RAY: I think blackout versus  
21 extended blackout is one way to think about it.

22 MR. REED: Okay. All right. So then  
23 going to slide 5, we were aware, of course, of this  
24 committee's thoughts that were expressed in your  
25 October 2011 memorandum.

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1           We took, which are very good sound  
2 thoughts, by the way, in regard to station blackout -  
3 we took that and actually put that rate in the ANPR  
4 and requested external feedback on the thoughts in  
5 terms of, really, the capabilities at facilities that  
6 deal with this kind of situation and what kind of  
7 vulnerabilities might exist as well as going through  
8 this kind of multi-phase thing and mobilizing  
9 resources.

10           And I think you're probably aware this has  
11 all been - we've been addressing all these as  
12 development of the implementation guidance as well as  
13 this rule making, and as I note there at the bottom  
14 the first real thorough industry wide indication of  
15 what the capabilities of these facilities are will be  
16 in the integrated plans in response to EA-12-049  
17 that's due on February 28th of 2013.

18           So the actual analysis that's going into  
19 this extended loss of AC power events in terms of  
20 understanding the vulnerabilities throughout including  
21 reactor core pump leakage as well as criticality  
22 issues and everything else that's ongoing for both  
23 BWRs and PWRs.

24           That underlies these strategies in  
25 developing these strategies and ensuring that the

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1 actions are taken are taken at the right time with the  
2 right kind of capacities and what you need to do in  
3 terms of maintaining or restoring these functions.

4 So that's ongoing right now and we can  
5 talk about that here in a second if you like. But I  
6 just wanted to let you know that we put that in.

7 If you weren't aware, we put that right in  
8 the ANPR and we requested comments. And the next  
9 slide -

10 MEMBER RAY: Let me ask a question here.

11 MR. REED: Yes, sir.

12 MEMBER RAY: You're talking about  
13 capability assessment. Do we make any distinction  
14 between the capability based on EOPs and those based  
15 on the SAMGs to voluntary things that go beyond or do  
16 we treat it all the same?

17 You assessed capability that is described  
18 in a SAMG just as we would in an EOP?

19 MR. REED: I'm not sure I'm following you  
20 on most of -

21 MEMBER RAY: The capability to cope with  
22 an extended blackout in some respects you would rely  
23 on a EOP here.

24 MR. REED: Yes.

25 MEMBER RAY: When you get beyond that you

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1 rely on a SAMG. I just looked at the words here about  
2 capability assessment.

3 I'm asking do we treat the capability that  
4 arises from SAMGs the same as we do EOPs, given that  
5 they're voluntary and not subject to the same  
6 inspection -

7 MR. BOWMAN: I think the best way to  
8 address it is - this is Eric Bowman - for the  
9 capabilities we're looking at, the capabilities that  
10 are in the EOPs are, of course, being looked at.

11 We aren't looking at the capabilities that  
12 are available through the Severe Accident Management  
13 Guidelines per se.

14 However, for the responses to the  
15 mitigating strategies order EA-12-049 there are FLEX  
16 support guidelines being developed, which is the  
17 industry term for the strategies and guidance that we  
18 required for what to do when they get to the response  
19 not obtained column in the emergency operating  
20 procedures.

21 So that's where they'll be bringing the  
22 portable capabilities into play, that those  
23 capabilities will also be available for the Severe  
24 Accident Management Guidelines but those capabilities  
25 are not a voluntary initiative. They're requirements

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1 of the licenses following the EA-12-049.

2 MR. REED: Ultimately, in that  
3 recommendation 8 rule making hopefully they all get to  
4 the same regulatory pedigree - you know, the SAMGs  
5 and EOPs and then ultimately down the road these FLEX  
6 support guidelines would then fit into both the EOP's  
7 a command and control structure before core damage as  
8 well as the SAMGs, which is the command and control  
9 structure after.

10 MEMBER RAY: Okay. Well, that's an  
11 important element, from the way I look at it anyway.

12 MR. REED: Okay.

13 MEMBER RAY: Thanks.

14 MEMBER CORRADINI: Harold asked a much  
15 more educated question so mine's not as educated. So  
16 I was under the impression that FLEX was primarily for  
17 prevention, not for mitigation. Am I off base?

18 MR. BOWMAN: No, you're right on base.

19 The program is set up -

20 MEMBER CORRADINI: So then the way he just  
21 answered - I'm sorry. I didn't hear you.

22 MR. BOWMAN: The program is set up by the  
23 industry and they've been doing analyses at the Owners  
24 Group level and at the licensee level has as its aim  
25 the prevention of core damage.

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1           The existence of the equipment and the  
2 strategies, those will still be there and they can  
3 still use them in their Severe Accident Management  
4 Guidelines.

5           They'll have a greater degree of  
6 capability than they did before and to a certain  
7 extent some of the strategies look remarkably like  
8 what they had in the SAMGs because they've got more  
9 equipment.

10           MR. REED: Yes, and also add that the  
11 order was just maintain or restore these functions  
12 period. It didn't say before or after core damage,  
13 okay.

14           So the order is broader and so, for  
15 example, one strategy for, like, an ice condenser or  
16 a mark three containment is that you need to do  
17 something with your igniters, okay, right off the bat.

18           In other words, don't wait until later on  
19 where you could have substantial hydrogen generation  
20 and if that - then at that point you lose containment.

21           So that tells you that that wasn't  
22 assuming that you were successful in precluding the  
23 core damage. So we haven't always went along with  
24 this - we buy into we're going to like the core damage  
25 idea which is the FLEX objective - a good objective,

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1 no doubt about it.

2 You want to preclude a core damage,  
3 obviously. But the order is broader and in one case -  
4 I'll give you that example - you can see what we've -  
5 we've gone to that strategy that would indicate that  
6 you could get some core damage so -

7 MR. BOWMAN: Where the preclusion of core  
8 damage comes into is they need something to do, some  
9 engineering evaluation or analysis to - in order to  
10 determine what size pumps and so forth - the hoses,  
11 the hose runs, the piping runs and the electrical  
12 supplies and loads. They need something to use as a  
13 basis for it.

14 The order itself is effective for beyond  
15 design basis external events so they also had to make  
16 certain assumptions in their analysis. For example,  
17 the existence of the stretcher systems and components  
18 that are safety related, seismically qualified, et  
19 cetera.

20 MEMBER CORRADINI: So I think I understand  
21 your answer but I guess what I'm - what's going  
22 through my mind is the environment that would be there  
23 before core damage is easier to predict and less  
24 uncertain.

25 So I understand where the FLEX concept

1 makes sense for prevention. The environment after  
2 things go to hell in a handbasket is a bit more  
3 uncertain and therefore I'm not clear that all this  
4 equipment is going to be useful or as useful.

5 So I'm trying to understand the  
6 assumptions that were made. I guess your answer to my  
7 question was they kind of know well here and they're  
8 making some assumptions as to what the environment  
9 will be after the fact.

10 CHAIRMAN SHACK: But when it says the  
11 order is capable of mitigating a simultaneous loss of  
12 AC power and maintain core cooling containment and SFP  
13 if you're maintaining core cooling I'm assuming I'm  
14 not going to get core damage. So, I mean, you're  
15 really aiming at -

16 MR. BOWMAN: Prevention.

17 CHAIRMAN SHACK: Prevention. I mean,  
18 obviously, if it doesn't work then we all -

19 MEMBER CORRADINI: Get something around -  
20 to get something around but I'm worried about the  
21 environment when you got it around -

22 CHAIRMAN SHACK: Yes, but then - but the  
23 whole goal here is not to get there, just like it is  
24 in FLEX. I mean, obviously, once you're there you've  
25 got the equipment.

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1           You're doing whatever you can do but  
2 clearly the rules have changed at that point. But the  
3 aim of the order is the same as FLEX, which is don't  
4 get there.

5           MR. BOWMAN: That is definitely the  
6 desired outcome. Yes, sir.

7           CHAIRMAN SHACK: Now, again, coming back  
8 to sort of Harold's question, you know, one of the  
9 problems with these performance based ones is it's  
10 hard to assess your likelihood of success when I'm not  
11 dealing with specific scenarios.

12           And so I get - and that's sort of one of  
13 my questions is, you know, what's your degree and I  
14 guess you really wouldn't know that until you see some  
15 of these capability assessments and the integrated  
16 plans.

17           But there's always this question of what's  
18 the degree of confidence that these schemes will  
19 actually work, you know -

20           MR. REED: You guys are actually getting  
21 into slide 8 already, okay.

22           CHAIRMAN SHACK: Well, there's an HRA  
23 that goes along with all this but I'll let you go on  
24 with your presentation.

25           MR. REED: Yes, if we get to 8 I think

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1 this is - both these were on 8 and 9 and I think  
2 that's where the guts of this thing is and we can - we  
3 can hold it there.

4 MEMBER SKILLMAN: Before you proceed, so  
5 far as pointing to what you're going to do in response  
6 to the order, what you're going to do with information  
7 that you find through your deliberations, what  
8 consideration are you giving now to what emergency  
9 preparedness is going to look like when this effort is  
10 coming to closure?

11 Let me give you an example. Let's imagine  
12 we're in a control room right now and we've lost our  
13 switch yard or we've lost offsite power and we're  
14 feeling good. Our emergency diesels are running. We  
15 see 4160.

16 We see we've got power, and we run along  
17 for 35 or 40 minutes and one engine stops running so  
18 now I'm down to one. We've moved into our emergency  
19 planning. We've pulled up the EPs, like Harold  
20 mentioned.

21 We've got an unusual event or an alert  
22 that with the second engine hanging on we're  
23 frightened because we've just come from maybe 500 days  
24 of full power operation. We have a full burden of  
25 DKE. And we lose that second engine.

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1           So we are in a station blackout. 50.63 is  
2 kind of terminated. We're into a new phase. Where do  
3 we go from the EPs to the SAMGs and how do you look at  
4 that now from an emergency preparedness perspective?  
5 Because it's the emergency preparedness actions that  
6 will save the day.

7           So what consideration are you giving to  
8 that in a forward looking manner?

9           MR. REED: Let me give a shot and then  
10 these guys can jump in. First, when you - once you  
11 lose that second diesel generator you're in a blackout  
12 and you have entered your loss of all AC EOP.

13           And, of course, at that point your  
14 immediate actions would be try to restore offsite  
15 power as well as so restore onsite power.

16           So you'd be trying to do those two and  
17 those 50.63 - they come out of 50.63. So you try to  
18 restore AC power. Of course, that's the best thing to  
19 do to the emergency busses, okay. So that would be  
20 ongoing.

21           Okay. In my mind, at some point very  
22 early on and we've actually - we've been talking to  
23 individuals now in terms of what we have now folding  
24 into place - if you would have talked to the  
25 dispatcher and they're saying boy, the grid is down -

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1 it's not coming back - it's not coming back anytime  
2 soon, all right, and say your four-hour coping plan  
3 or old framework, the 50.60 framework, and you talk to  
4 your crews.

5 They went out and they tried to figure out  
6 what happened to that diesel generator and why they  
7 stopped running and they're saying, I've got to rip  
8 these things apart - it's going to take eight hours,  
9 okay.

10 MEMBER SKILLMAN: Or 36.

11 MR. REED: Or whatever, yes. At that  
12 point I've asked people what will you do and they said  
13 well, we're going to go to FLEX immediately. In other  
14 words, so what you do is then start the - get the  
15 FLEX, put it in place, have it in service before that  
16 four hours, which is your total blackout grouping.  
17 You're supposed to - say you're a four-hour plant,  
18 okay, before that is up.

19 And so you can make - kind of restore  
20 these functions per FLEX and in fact as you'll see  
21 here in a second in our regulation the way we're right  
22 now intending to go we're going to have a connector on  
23 the current 50.63 that's going to point that out to  
24 people that says, you know, you have a specified  
25 duration for your old 50.63 but you shall basically do

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1 these mitigating strategies before that thing is over  
2 if you get to that situation.

3 So we recognize the situation so right now  
4 the way these FLEX support guidelines are being  
5 developed, okay, this is a good answer. They are  
6 being fitted into the EOPs in this manner.

7 And so when I get response not obtained,  
8 okay, I have lost my offsite power. I've lost my  
9 onsite power. I can't get it back.

10 I'm truly response not - I could even have  
11 lost an alternating AC generator if that would have  
12 happened. That's the extreme circumstance but say I  
13 did, then I'd go with FLEX and that's where it links  
14 in on the EOP side before core damage, okay.

15 MR. BOWMAN: The loss of the alternating  
16 AC is not that remote a likelihood for a multi-unit  
17 event because there are a number of places that don't  
18 have as many alternating AC sources as they have units  
19 on site.

20 So in a case like that, it would be an  
21 immediate transition to the -

22 MEMBER SKILLMAN: So I hear you say that  
23 the answer to my question regarding forward looking on  
24 emergency preparedness is the insertion of the FLEX  
25 activities somewhere between where you time out on

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1 50.63 and where you begin these new efforts on the  
2 order.

3 MR. REED: And hopefully it's continuous.

4 MR. CHEOK: Not quite.

5 MEMBER SIEBER: But right now emergency  
6 planning is deterministic and it depends on what  
7 symptoms you have at the plant. When you get the loss  
8 of offsite power your in an unusual event.

9 If you have a diesel failure or interim  
10 alert, if the second diesel fails, your site area or  
11 your general and offsite actions and emergency  
12 plannings roll along regardless of how many hopes you  
13 have of restoring power or how many alternatives you  
14 have or what have you.

15 And so I presume that that will continue  
16 to be that way in a deterministic fashion and, of  
17 course, the site only makes recommendations. It's the  
18 offsite authorities that make decisions about  
19 evacuation, shelter and so forth.

20 And because they have the best knowledge,  
21 first of all, they're the ones responsible and  
22 secondly they have the best knowledge of how effective  
23 an evacuation would be and how prepared they are to do  
24 it and to make the decision as to what spares the most  
25 people.

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1           And from our licensees' standpoint, the  
2           idea is to do everything that they possibly can to  
3           either maintain power supply or restore power supply -  
4           that emergency planning takes its own path based on  
5           various touchstones as you move through the event.

6           MR. BOWMAN: Was that the type of  
7           emergency planning you were trying to address in your  
8           question?

9           MEMBER SKILLMAN: I was really on the  
10          plant level when you -

11          MR. REED: You were thinking the EOPs.  
12          That's why -

13          MEMBER SKILLMAN: You're thinking the EOPs  
14          and where do you transition to the SAMGs.

15          MR. REED: Emergency planning impacts too.

16          MEMBER SKILLMAN: Yes, I agree with Jeff.  
17          I was going down the same path at some degree that  
18          Harold was going down. Where do you - where is the  
19          hand-off and how is this - how is this a seamless  
20          transition?

21          MR. BOWMAN: With a mitigating strategies  
22          order the way that interacts with the EOPs is it's the  
23          response not obtained column that calls in the -  
24          whenever they've developed the FLEX support  
25          guidelines.

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1           In addition, the - in our guidance for the  
2 FLEX support guidelines for the order we've specified  
3 that they need to monitor for entry conditions into  
4 the SAMGs. So there would be no change in the hand-  
5 off to the SAMGs.

6           If they have an indication of imminent or  
7 actual core damage then that would be when it would  
8 appropriate to start going down that path.

9           MEMBER SKILLMAN: Okay. Thank you. Thank  
10 you.

11           MR. REED: Okay. Just on this - the  
12 bottom line part of this - okay. First of all, the  
13 feedback we got on your issues on the top part of this  
14 slide, of course, industry, their comment was a follow  
15 the implementation of the order, EA-12-049, and those  
16 issues will be addressed. In fact, they have been  
17 addressed right now. They're still being addressed.

18           And then new plants, new reactor designers  
19 - they opted - this could be designed into this  
20 situation a little bit more. Some engineering  
21 approaches could be also folded in.

22           So you probably saw that in some of our  
23 comment responses too and that could be done in a  
24 combined license and design certification process.

25           So and that's an issue you'll see coming

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1 back and how much should we allow for engineered  
2 approaches too. So that was the feedback on what were  
3 your thoughts.

4 It was good feedback and now I'm going to  
5 come to the bottom slide and it'll bring us back full  
6 circle to where I started off with the SRM here.

7 The - in March of this year, March 12th of  
8 2012, of course, we issued this mitigating strategies  
9 order and the order was in fact recommendation 4 for  
10 the NTTF.

11 It was a performance-based version of  
12 recommendation 4. It's not 4.2. It's not go buy  
13 another set of your B.5.b equipment and try to use the  
14 DDMGs. It wasn't even 4.1, which was the prescriptive  
15 872 thing.

16 It was a performance-based version of 4 in  
17 the order and such - and in fact I remember I was  
18 commenting and said we just put the rule in the order.

19 And so - and I think that was a good thing  
20 because we recognized at that time that NTTF had a  
21 great idea of using this stuff, the B.5.b equipment.

22 If you think about it, the B.5.b equipment  
23 is for a limited emission time, 12 hours.

24 It's not an event to lock the grid  
25 forever, for example. It wasn't the entire site -

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1 weren't for the entire site - external vent pits, the  
2 entire site B.5.bs per unit, okay.

3 It wasn't for all the functions  
4 simultaneously, work for all the functions for the  
5 entire site and were for all moats. And so when you  
6 think about it first - and then we have to reasonably  
7 protect this equipment from external events, not fires  
8 and explosions.

9 So at first it seems like a great idea and  
10 it is but then when we start to really pull back and  
11 think about it, we had to build the strategies all  
12 over.

13 And so that's in fact what happened. NEI  
14 built the strategies all over in the form of NEI 12-  
15 06, okay, and we have an ISG that was put out in  
16 August of this year that endorses that and that became  
17 the guidance for an order that became, really, the  
18 rule making in the order.

19 So as a result of that, this is an unusual  
20 situation in rule making. The only one I'm really  
21 familiar with that's happened like this the order is  
22 very, very much an overlap of the rule making.

23 So learning the lessons from  
24 implementation of this order are absolutely key and  
25 this one more than most because it's an unbounded

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1 order, as I'll say here in a second.

2 And so implementation becomes key. It  
3 kind of set the bounds and then you're going to  
4 hopefully get every licensee out there trying to  
5 figure out what they can do for their design and  
6 finish the licensing in their situation and that  
7 becomes what we accept and that goes to the meaning  
8 and intent of the rules.

9 So if you're following me here, feedback  
10 becomes very important on the implementation of the  
11 order for me to do all the rule making. That is, you  
12 know, a sound rule making that I could put in the Code  
13 of Federal Regulations and not get, you know,  
14 crossways with this order.

15 Okay. So that's where - what that last  
16 rule says and that comes full circle with the assessed  
17 round from the Commission who of course, and I'll -

18 CHAIRMAN SHACK: If you find the  
19 implementation of this order fully acceptable.

20 MR. REED: Right. It can - actually it  
21 can be either. You know, it's both sides. It can be  
22 either impossible to do it or in fact we have actually  
23 too much leniency.

24 There may be things we find in the order  
25 but oh, boy, we should not allow that - we need to fix

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1 it. It's both sides of that equation, absolutely.  
2 That's right.

3 So that's the kind of feedback that helps  
4 us do the rule making in a better and much more  
5 informed fashion. So that's what that last bullets  
6 say, okay.

7 So that's the ACS feedback slide and now  
8 I think I have an evolution slide here. Then we'll  
9 get to the whole guts of this thing. So we had 45  
10 sets of comments from the ANPR. That was good  
11 feedback.

12 We had numerous public meetings - I don't  
13 even know how many - when we developed the  
14 implementation guidance for the mitigating strategies  
15 order, and then we had tons and tons of internal  
16 discussions almost on a daily basis, certainly on a  
17 weekly basis, with the steering committee on these  
18 other Fukushima actions that also informed us.

19 So we have a lot of information that  
20 affected what we're thinking and we've come over more  
21 towards a - much more of a FLEX - in fact, I think  
22 you'd find that the whole world has gone much more  
23 towards a FLEX flexible type of approach to these  
24 situations. That's kind of where we're at today.

25 And so that middle bullet there about the

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1 way we developed this guidance and implemented this  
2 idea and the strategies was probably the most  
3 influential part that affected where we're at today,  
4 if you took a snapshot of where we're at today.

5 So that's how we've evolved from last  
6 March where we put this ANPR out which if you looked  
7 at it the ANPR is kind of a one leg in one world and  
8 another leg in the other world and asked these  
9 questions which kind of looked like a deterministic  
10 kind of a set of questions, and then they have a set  
11 of questions that are a lot more like a B.5.b  
12 50.54(hh)2 kind of set of questions, and we tend to go  
13 much more towards the more high-level performance-  
14 based flexible type of thing and that's where we're at  
15 today.

16 I think that's - that sets the table now  
17 for really kind of all of the insights I think that  
18 are kind of already - we've touched upon these things  
19 already and we can - we can do that, you know, as much  
20 as we want now for the next - I think it's five slides  
21 really are the - really the heart of this whole  
22 presentation where I'd like to - like to get your  
23 thoughts and feedback.

24 I'll hold up. Do you guys want - you're  
25 okay to go to slide 8? Okay.

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1           So starting with the key and what I'm  
2 calling the key and early insights, then first of all,  
3 the order, as I think I've mentioned already, was  
4 unbounded and it's - from a regulatory standpoint  
5 that's a real tough thing to deal with - an unbounded  
6 order - and it becomes very tough because as mentioned  
7 what is success in a situation where I don't even know  
8 what these events might be.

9           And so that's - that was the nature of  
10 EA-12-049. There's only - as far as I'm aware of the  
11 only situation like that and that is 50.54(hh)2 and  
12 it's pretty insightful that that was the Commission's  
13 direction to follow that.

14           So I thought that was very good SRM  
15 direction. They knew that, directed us to follow an  
16 approach like that.

17           Now, unfortunately, when you have an  
18 unbounded order there's no other way to do this  
19 practical standpoint than to set the limits in the  
20 guidance because licensees can't go out there and  
21 figure out what to do unless they know there's some  
22 balance about what this thing is.

23           And so those bounds had to be set in the  
24 guidance - the implementation guidance. So that's  
25 where they're set and that's where we get into these

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1 assumptions about what should be the initial assumed  
2 condition and what should be down the road, what  
3 should be assumed and that kind of thing.

4 So that's when you go into NEI 12-06 you  
5 see that and you see that in our ISG and that's a  
6 pretty big and a tough situation from a regulator to  
7 deal with, at least from a rule maker.

8 I should say a rule maker here and -  
9 because I think probably most of you, if you go back  
10 through - and my 32 years in this thing, you know, I  
11 started back in the old design basis and Chapter 15  
12 analysis kind of thing where we have a set of very  
13 bounding postulated events with assumed conditions and  
14 expense and occurrences that create this damaged state  
15 and then we have systems, structures and components  
16 that we - and people and procedures that are going to  
17 mitigate that thing and then we have a set of  
18 acceptance criteria that are going to meet typically  
19 on fission product barrier integrity, and you see that  
20 in Chapter 15.

21 We can't do that here because I can't tell  
22 you what the success is. I could have a great  
23 mitigating strategy, for example, and the event could  
24 be so severe I just - I go - I fail, right off the  
25 bat, and that's unfortunately the circumstances that

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1 we're in.

2 So that becomes then so what should be  
3 success here. I mean, what should we call regulatory  
4 success and that's what that second bullet is trying  
5 to get at.

6 What we think regulatory success should be  
7 is something like this. In other words, having this  
8 equipment, having it reasonably protected, having  
9 these strategies in place, having them arranged in  
10 such a fashion that it gives the people in the control  
11 room and the staff on the site the best probability of  
12 being successful, okay.

13 We mentioned how they're built into the  
14 EOPs, how they might be built optimally into the  
15 SAMGs in such a way that it gives them the best chance  
16 of mitigating the wide range of beyond design-based of  
17 events they might see.

18 Certainly, if they're familiar with all  
19 this stuff that also helps a lot and we're working  
20 them through the process of designing these things  
21 such that they can actually go out, get the stuff,  
22 deploy it, figure out what that time frame is, handle  
23 that whole situation with that time period - in other  
24 words cope with that blackout situation and do what  
25 they have to to cope with it in a phase one, phase

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1 two, phase three kind of situation here.

2 So I'll hold up on that but that's - those  
3 first three bullets kind of go together. That's kind  
4 of like the heart of this whole thing. It's the heart  
5 of the order.

6 It's kind of where we're all - we're  
7 really kind of in the same place on this rule making.

8 It's where we're going. I'll just - I'll probably -  
9 if you have any feedback there I'll hold up and let  
10 you chime in on that.

11 CHAIRMAN SHACK: Yes, one of the things is  
12 if you look at the events that 50.63 was meant to  
13 address and the way you address it, you address it if  
14 you have, for example, emergency diesels operating or  
15 an alternating AC that survives. You have a lot more  
16 capability than you probably will from the FLEX  
17 equipment.

18 And the question is, you know, should the  
19 regulation be aimed at providing that extra - you  
20 know, FLEX is kind of okay.

21 You know, I'm hanging on, you know,  
22 fingernails on the rock. I'm hanging there but I  
23 haven't got a whole lot left to go. If I had a robust  
24 alternating AC that survived my - beyond designed  
25 basis earthquake I would have a lot more capability

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1 and the question is, you know, do you get enough  
2 assurance from the FLEX thing or do you need to do  
3 things to build on that installed capability, you  
4 know, where I push the button rather than, you know,  
5 do I have an acrobatic -

6 MEMBER RAY: Yes. No, Bill, I wrote down  
7 here because I want to say it sounds like to me the  
8 same thing, which is this is the necessary thing to do  
9 what you're describing.

10 The problem is does it mask the need to  
11 change the design basis for the reasons that Bill said  
12 so that you don't have to rely on what - the things  
13 that you're - I don't see that you're able to address  
14 that in what you're doing but it is a concern.

15 We become so confident in these measures  
16 that we don't bother to change the design basis where  
17 that's the appropriate step to take.

18 CHAIRMAN SHACK: What is the - I want to  
19 see that consideration.

20 MEMBER RAY: Yes, yes, yes.

21 MR. REED: I would chime in that, you  
22 know, to go to NTF 2.1 which is, of course, part of  
23 all effort by the staff, if you do identify  
24 vulnerabilities for external events there I'd like to  
25 say, you know, the mitigating strategies can't solve

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1 the problem of 25 feet of extra water coming across  
2 the facility.

3 You really have to do that and design the  
4 facility such that that doesn't happen. You keep the  
5 water off the facility.

6 So if you have those vulnerabilities  
7 you've got to definitely - in my personal opinion, you  
8 must fix them. Those are real issues and then  
9 hopefully if you've got that out of the way, okay,  
10 then this can address something that goes more to the  
11 uncertainties that you have.

12 MEMBER RAY: Yes. I would say I think the  
13 only thing that I could offer in this context would be  
14 to bear in mind that, as Bill described it, hanging on  
15 at the edge, we just don't want to develop  
16 overconfidence in well, we don't need to worry about  
17 this because we've got mitigating strategies.

18 And that's the answer to every issue that  
19 comes up, and that would be my contribution, I guess,  
20 at this juncture to what we're saying here is we  
21 always want to be careful not to over - be  
22 overconfident in these so that people, like I say, say  
23 well, doesn't matter - we can mitigate anything that's  
24 beyond the design basis. So we're set.

25 MR. CHEOK: Right. I think that's a good

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1 point.

2 MEMBER CORRADINI: Can I - can I ask a  
3 different question that goes along with this? Is  
4 there - is there a particular - I'm sure I know the  
5 answer to it. I just want to - is there a particular  
6 plant with a level one and two PRA that you can test  
7 this out to see where you sit relative to these  
8 strategies?

9 In other words, I'm looking for some sort  
10 of test stand in which I can test out all of these  
11 rules and guides such that I've got a plant that's out  
12 there.

13 I have a developed PRA to some level of  
14 sophistication with seismic, with external events that  
15 you would say okay, now I've got the plant as it is  
16 with this PRA. Now I'm going to insert these things  
17 and see is it - do I need to augment the onsite  
18 capabilities or this extra portable stuff is really  
19 going to help me?

20 I guess without them I would have a hard  
21 time knowing how helpful some of this is.

22 MR. BOWMAN: I think one thing that we  
23 need to bear in mind is that, as Tim mentioned,  
24 fundamentally the order itself is unbounded so absent  
25 a specific circumstance we can't do a good assessment

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1 of how effective this FLEX strategy is going to be.

2 There is an interplay, however, with the  
3 NTTF recommendation 2.1 reevaluations of the seismic  
4 and flooding design basis and we've been working with  
5 the team that's looking at that.

6 Some of the information that they'll be  
7 taking into account in determining what to do with the  
8 design basis, for example, with the flooding is going  
9 to look at a risk-based evaluation of - or risk  
10 informed evaluation, rather, of how well the  
11 mitigating strategies would be effective including the  
12 human performance factors.

13 We just - I believe we've already put out  
14 the interim staff guidance for their integrated  
15 assessments for the flooding reevaluations and you can  
16 see in there where the - because that gives you - if  
17 you've got a new maximum flood level it gives you  
18 boundaries that you can look at to do the analysis to  
19 see that the mitigating strategies are effective.

20 CHAIRMAN SHACK: That is a point. The  
21 people doing seismic PRAs and flooding PRAs in  
22 response to 2.1 they'll presumably be crediting these  
23 mitigating strategies, among other things.

24 MR. CHEOK: They will be doing that.  
25 That's correct. I mean, there are certain rules they

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1 can use to credit the mitigating strategies, i.e., you  
2 need to have the procedures in place.

3 You have to have some kind of a pedigree  
4 to the equipment and to take credit for these  
5 equipment you have to have the procedures, the HRA, as  
6 you said earlier, and then you can credit them.

7 MEMBER STETKAR: Let me try something  
8 here. I was hoping we'd get to the fourth bullet but  
9 we may never get there so let me jump in.

10 I hear all of these things about  
11 reevaluating the design basis. Fine. We're not  
12 talking about the design basis. By definition you  
13 survived the design basis.

14 We're talking about things that are much  
15 worse than the design basis. So fine. If I have -  
16 today is my design basis peak ground acceleration for  
17 an earthquake at a ten to the minus four frequency is  
18 .15g, maybe now my new design basis will be .2g  
19 instead of .15g. Fine. I have to show that I can  
20 survive that.

21 We're not talking about that. We're  
22 talking about .5g. We're talking about 1g  
23 earthquakes. We're talking about 6g earthquakes if  
24 they could ever happen.

25 MEMBER CORRADINI: Let's move to flooding.



1                   MEMBER STETKAR: No. I don't want to talk  
2 about flooding because I want to talk about things  
3 that have a more continuum than indeed have measurable  
4 frequencies.

5                   The question is that fourth bullet says  
6 develop, mitigate these strategies for beyond design  
7 basis. So let me take a .5g earthquake or a 1g  
8 earthquake or a 1.5g earthquake.

9                   Should result in a bounding approach,  
10 bounding approach, means it can solve any of those  
11 things no matter how bad it could possibly be for loss  
12 of -

13                   CHAIRMAN SHACK: What are design  
14 conditions?

15                   MEMBER STETKAR: Hmm?

16                   MR. REED: Yes. I probably should have  
17 been better with my bullet. That last benign part was  
18 just a loop with two multiple failure diesel  
19 generators.

20                   MEMBER STETKAR: You know, so the - but  
21 that's what the question is. In going back to  
22 something that Mike asked, you used words in this  
23 presentation that the FLEX equipment should be  
24 reasonably protected against what? A .5g earthquake?  
25 A 1g earthquake? Against something that occurs at

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1 some frequency that the implication is that there are  
2 things that occur at frequencies that are small enough  
3 that we can't protect the plant - a large meteorite  
4 impact, for example.

5 So implicit in all of this is some type of  
6 risk informed approach. You say things that it gives  
7 the operators the best probability. You look in the  
8 transcript about it being successful. It's a risk  
9 informed approach - the widest range of events they  
10 might see. In March 10th, 2011 - I'm sorry, yes, 20 -

11 MR. REED: March 11th.

12 MEMBER STETKAR: 2011. Well, March 10th  
13 the guys didn't believe they would ever see the thing  
14 that happened the next day.

15 So I think you need to be very, very  
16 careful when you cast this as something that will  
17 solve all problems under all possible circumstances  
18 that you could ever envision.

19 MR. REED: That's the first event as that.

20 MEMBER STETKAR: Well, the first and the  
21 fourth together because it says that these solutions  
22 will provide a bounding solution to anything that we  
23 could ever explain.

24 MR. REED: Yes, let me try to fix that  
25 because I certainly don't think it will solve -

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1 MEMBER STETKAR: Okay. That's -

2 MR. REED: And I want to be clear about  
3 that. I think that I need to be explicit now in that  
4 last bullet.

5 I think that if you were to - you develop  
6 these strategies beyond design basic external event  
7 initiated blackout, okay, that if you get the - I'll  
8 call it the run of the mill benign thing, you know,  
9 this is the grid goes down and then I unfortunately  
10 have a bad day and both my diesel generators fail that  
11 these are very good for that circumstance.

12 In fact, I think they may actually work  
13 and be effective for that situation. I'm not -  
14 frankly, I'm not confident they would work for a lot  
15 of those beyond design external events which they're  
16 intended to.

17 I'm with you on that, and I think we fully  
18 recognize that there's, you know, only so much you can  
19 get - only so much blood out of these stones that are  
20 in place already with, you know, real concrete and  
21 steel that we can get. So I definitely have the same  
22 mind set. I probably didn't express myself very well  
23 here.

24 MEMBER STETKAR: Well, in terms of some of  
25 the discussion that went on earlier about the key is

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1 evaluating the effectiveness of the implementation  
2 strategies, you know, what expectations will the staff  
3 have or the Commission have for demonstration of  
4 confidence that they can be implemented effectively  
5 with some reliability over the range of events that we  
6 deem they should apply.

7           You know, and I'm not going to hazard a -  
8 you know, is it a ten to the minus seven event? Is it  
9 a ten to the minus six event? Is it - you know, what  
10 level do we expect these things to apply?

11           MEMBER SCHULTZ: So that ties into two  
12 features. One is the element of definition for  
13 communication purposes because one of the things that  
14 you just described in this forum is that it's  
15 important to choose the words carefully and to paint  
16 the picture carefully so that everyone will understand  
17 what in fact is being achieved.

18           It also gets back to Harold's point of how  
19 the implementation runs forward and what is going to  
20 be applied here - is it applicable to something else,  
21 to some other event or circumstance that a licensee is  
22 going to say well, that's taken care of - I've gotten  
23 that.

24           I've done this part so I can apply it  
25 here, here and here. Is that in fact true? And I do

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1 want to pull back to Mike's question that we haven't  
2 yet answered which is is there an opportunity through  
3 some demonstrable process that a level one, two PRA or  
4 something like that that handles the sequence and  
5 frequency of events that John is talking about to see  
6 whether there's an opportunity to use that as part of  
7 the example. That would be a good opportunity perhaps  
8 to communicate as well as to analyze.

9 MEMBER STETKAR: A bit of the problem on  
10 a level one, two PRA is somebody's going to pick up  
11 Surry and Peach Bottom because that's the only ones  
12 that the staff knows about. And they have -

13 MEMBER CORRADINI: That would be too  
14 singular but you've got to do something to at least  
15 exercise it.

16 MEMBER STETKAR: Right. Well, but you  
17 would be doing PRAs for 2.1.

18 MR. CHEOK: That is true and I think if  
19 you -

20 MEMBER STETKAR: But that'll also be  
21 specific on specific plans or the staff will have  
22 something in house.

23 CHAIRMAN SLACK: The plants would be doing  
24 them.

25 MR. CHEOK: Also I think if you look at

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1 the SORCA results, even though we didn't explicitly  
2 say that and I see -

3 MEMBER CORRADINI: Right, but the SORCA  
4 though - maybe I misunderstand SORCA but SORCA you  
5 picked from the tree. I'd rather look at the tree and  
6 see that the apple you picked was the reasonable  
7 apple. I mean -

8 MR. CHEOK: That is true. SORCA focused  
9 on scenarios and basically took credit for some of the  
10 FLEX equipment and the delta you saw in the risk from  
11 SORCA was - a lot of the delta came from the credit  
12 for the FLEX equipment.

13 But you are absolutely correct. We need  
14 to somehow weight the sequences with the frequencies  
15 and we haven't done that yet and we should probably do  
16 that.

17 MR. REED: I'll just - I'll just note that  
18 that's going to rely an awful lot on human action and  
19 human reliability and so I think that's a very big -  
20 that's a tough challenge in PRA space.

21 You guys know that, and I come back - just  
22 to come back full circle to where we started, a little  
23 bit here on this robust alternating AC source and what  
24 are the - what's the difference between that and the  
25 mitigating strategies which will really kind of

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1 pinpoint things going right to a pump or whatever.

2 I'm a big fan of firing up the entire 4160  
3 distribution, the whole bus and all the equipment on  
4 it, and I think you get a lot more for that. But you  
5 can't - you know, in these situations you don't know  
6 if you can do that.

7 CHAIRMAN SHACK: No. But, again, it  
8 becomes - there's a certain set of situations I would  
9 expect to handle one way and, you know, less  
10 frequently, you know. As we said the other day, I  
11 look at this as a three-tier thing. There's a 50.63,  
12 which handles one set of events.

13 There's the mitigating order which handles  
14 a different set of events and then there's 50.55(h)  
15 that sort of gets me to where I've lost lots of stuff  
16 and, you know -

17 MEMBER STETKAR: But still under a  
18 controlled circumstance. I mean, you know, it has  
19 presumptions built into it about level of -

20 CHAIRMAN SHACK: Well, but, I mean, I  
21 can't survive everything.

22 MEMBER CORRADINI: That's the whole -

23 CHAIRMAN SHACK: But that's the point. I  
24 guess that - but again, I think you have different  
25 expectations for surviving, you know, sort of based on

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1 frequency level or, you know, you have - you have  
2 different expectations and -

3 MR. REED: I would love to have this PRA  
4 tool and try to understand what that is because I  
5 think that's the real - if we can measure it. I mean,  
6 I do come back to recognize the fact that when the  
7 Commission issued the order they said this was largely  
8 due to the uncertainties associated - the known,  
9 unknowns, and unknowns.

10 You know, we've heard this - the  
11 uncertainties associated with these events and so we  
12 need more defense in depths to address these  
13 uncertainties.

14 And so I'm sure you can deal with that  
15 uncertainty, you know, in a PRA space but, you know -  
16 I just throw that out there so. Yes, sir.

17 MEMBER STETKAR: Some of the defense in-  
18 depth work remember, unless I've misremembered it, the  
19 FLEX equipment - I mean, the FLEX equipment isn't  
20 designed to repower the 4160 volt bus, right?

21 MR. REED: No.

22 MEMBER STETKAR: The FLEX equipment has -  
23 some could be but not across the board.

24 CHAIRMAN SHACK: But I guess after so many  
25 hours they really expect to come in with something.

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1                   MEMBER STETKAR: Yes. But it's in terms  
2 of load. I mean, you don't - you don't restore one  
3 full train of high pressure injection, emergency feed  
4 water, you know, containment spray - whatever those  
5 systems are because it just doesn't have the capacity.

6                   MR. BOWMAN: The current way forward that  
7 industry is following includes bringing in two  
8 megawatt generators for four hours.

9                   MEMBER STETKAR: Oh, okay. That - okay.

10                  MR. BOWMAN: So their plan is to have the  
11 capability and capacity to repower a train at level  
12 4160 but that's presuming that the 4160 volt bus is  
13 intact.

14                  MEMBER STETKAR: Well, that's -

15                  MR. BOWMAN: And there's other aspects of  
16 the FLEX strategies that are intended to address the  
17 nonintact 4160 volt bus.

18                  MEMBER STETKAR: And indeed, for some of  
19 the real severe events I'd shut Mike down on the  
20 flooding in which, you know, we saw the effects at  
21 Fukushima.

22                  But some of these very large earthquakes,  
23 if you look at risk assessments that have been done in  
24 many cases the lowest capacity equipment within the  
25 plant tends to be the electrical switch gear toppling

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1 over. And so when I start to go into beyond design  
2 basis accelerations, depending on their elevation and  
3 the building and their anchorage and things like that,  
4 but the switch gear itself can be a vulnerability  
5 which brings into question the issue your raised that  
6 if it's not there as in Fukushima, if there's nothing  
7 to plug into you can have a thousand diesel generators  
8 available and it's not going to work.

9 MR. BOWMAN: And that's where we have in  
10 the guidance the specifications that'll have pumping  
11 capacity.

12 MEMBER STETKAR: Electrical - electrically  
13 independent pumping capacities, low pressure, small  
14 volume. So you have to be able to depressurize and  
15 the operators need to know that they need to  
16 depressurize in enough time.

17 MR. CHEOK: So I guess let me try to  
18 summarize some of what you just said. As you all  
19 said, we do have 50.63 in place and we have had  
20 efficiency - we have done an efficiency of the rule  
21 and we have noted that the frequencies of lost offset  
22 power have in general come down. Durations have  
23 increased by a little bit. But in general the rule is  
24 still an efficient rule.

25 Diesel reliabilities have gone up because

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1 of the maintenance rule and because of the ROP. What  
2 we have noticed from Fukushima was that there was the  
3 lacking in terms of a large area type external event  
4 that could make unavailable diesels or other  
5 alternating AC sources.

6 So what we're trying to do is increase the  
7 coping capacity and also have the worse alternate  
8 sources that is capable of mitigating not just an  
9 event at one site but an event that would disable  
10 multiple sites, systems at multiple sites and a system  
11 that is independent in terms of location so that when  
12 you do have a large area event you can bring in  
13 equipment from somewhere that's not - hopefully not  
14 affected by the same event.

15 So but that's the idea of recommendation  
16 4 at this point.

17 CHAIRMAN SHACK: But coming back to John's  
18 bigger question, I mean, that's almost yesterday's  
19 discussion. You know, how much defense and depth is  
20 enough - how low do you have to drive the residual  
21 risk - you know, how confident do you have to be that  
22 you've got that residual risk that low and I'm not  
23 sure you guys can answer that question. That's all.

24 MEMBER CORRADINI: If I might just - Steve  
25 said something that I thought was important. Maybe

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1 you caught it, maybe you didn't, which is your words -  
2 reading them, if you weren't as highly educated group  
3 here would say that you've covered the whole water  
4 front and you don't cover the whole water front  
5 admittedly.

6 There's a residual risk that prevention -  
7 that this prevention - this new prevention envelope or  
8 shield is not going to cover and it's got to be clear  
9 that that's out there.

10 Otherwise, somebody's going to think  
11 you've covered it and the next time something happens  
12 you'll -

13 MR. REED: It's clearly impossible.

14 MEMBER CORRADINI: I find it impossible,  
15 clearly, but having been in other venues people have  
16 swallowed that -

17 MR. REED: I understand. We have to be  
18 honest and open and as clear as we can.

19 MEMBER STETKAR: I often use the construct  
20 of think of meteorites. People disregard those as  
21 irrelevant. They never happen. Quite honestly, if  
22 you do risk assessments they happen more frequently  
23 than you might expect.

24 But instead of looking at the things that  
25 we've seen and thought about, think about when you

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1 write all-encompassing words just keep in mind a big  
2 meteorite and will the words address that. If they  
3 can't, you need some qualifiers.

4 MR. REED: I hear you.

5 MEMBER STETKAR: Because it's a nonzero  
6 event.

7 MR. REED: It's my -

8 MEMBER STETKAR: And you can't - the  
9 plants are not designed for it. It will - they will  
10 not survive that event. It's one element of the de  
11 minimis acceptable risk.

12 MR. REED: Absolutely. Yes, we've - I  
13 think made it safer for these as we've put these in  
14 place. I wish I knew what that it was that quantified  
15 it. I mean, we've talked about trying to use these  
16 tools.

17 I would simply note that when we did  
18 50.63, as some folks such as John's familiar with, we  
19 did a lot of risk studies in that forum when we  
20 developed that and we have estimates of core damage  
21 frequencies and go from four to one. You know, NUREG-  
22 1776 talks about that.

23 At that point in time that's kind of a -  
24 that is a snapshot of what they thought the station's  
25 blackout risk and there wasn't any of this beyond

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1 design, this external initiators in that data and it  
2 was first -

3 MEMBER STETKAR: And it was first - right.  
4 That's the - that's the problem.

5 MR. REED: Yes. And so it was so - it  
6 hadn't occurred yet and, of course, it has occurred  
7 now but so I just put that out there. So I like that  
8 idea but at the same time I'm not sure - I wish - I  
9 don't know.

10 MEMBER CORRADINI: I didn't - I didn't buy  
11 into his example. But I do think - I do think the  
12 general - the general principle that I think Steve was  
13 bringing up is fair to make sure that - because the  
14 audience is looking for an answer and if you give them  
15 the opportunity they're going to accept the answer you  
16 didn't mean to give them.

17 MR. REED: Yes. That's a good point.

18 MEMBER CORRADINI: That's what I think  
19 Steve's point is.

20 MEMBER SCHULTZ: Exactly. That's it.

21 MEMBER ARMIJO: Well, can you answer the  
22 question would this - could you make the statement  
23 with the modified or upgraded station blackout rule we  
24 will be able to handle with high confidence seismic  
25 events at least as severe as happened at Fukushima,

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1 flooding events that - at least as severe as what  
2 happened at Fukushima, and combined seismic and  
3 flooding events at least as severe as what happened at  
4 Fukushima?

5 MEMBER STETKAR: Sam, remember the  
6 Fukushima seismic event was only marginally -

7 MEMBER ARMIJO: I understand.

8 MEMBER STETKAR: - above its design basis  
9 for -

10 MEMBER ARMIJO: I understand that.

11 MEMBER STETKAR: It was a minimal seismic  
12 event.

13 MEMBER ARMIJO: Yes, I understand that,  
14 John. I Just want to get an answer to that and then  
15 we can go beyond those things.

16 But the combined seismic and flooding was  
17 - just the flooding alone were super severe and, you  
18 know, from the people I talked to, nontechnical  
19 people, they say can we handle that.

20 And so yes, we're going to do that. And  
21 if this rule can't be at least that then how can we  
22 claim anything beyond that?

23 MR. REED: I would put it in the context,  
24 first of all, of what the external events are for that  
25 site and that location. Okay. First, along the U.S.,

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1 North America, wherever the site is, as opposed to  
2 Fukushima.

3 Fortunately, we don't have anybody over in  
4 Fukushima. We are in North America and that's - we  
5 don't have the tsunamis rolling across anybody. I  
6 mean, we do have San Onofre sitting there. I know we  
7 have Diablo Canyon -

8 MEMBER ARMIJO: We have dam failures. You  
9 got this Oconee issue coming up.

10 MR. REED: Yes, all of -

11 MEMBER ARMIJO: We could have a flooding  
12 event of the - of the order of a Fukushima event.

13 MR. REED: Exactly. So we have to look at  
14 those situations and what makes sense for those like  
15 Oconee, like in Jocassee and Everett, whatever the  
16 situation that's at each circumstance when there might  
17 ever - there may be, okay.

18 And then within that context and those  
19 events and that design and that licensee basis and the  
20 features there address the question you're saying and  
21 that's actually the way the order and the  
22 implementation guide says you -

23 MR. BOWMAN: Okay. But then it has to be  
24 combined with the 2.1 reevaluation effort.

25 MR. REED: Absolutely, because in fact

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1 let's say you get to a point where you do realize that  
2 you're - unfortunately the way you were licensed under  
3 GDC 2 for your flooding, say, 40 years ago that we  
4 know - we'll look, you know what, it is 15 feet  
5 higher.

6 That's an NTTF 2.1 thing. I can't - I  
7 can't have these guys in rowboats trying to go out and  
8 get the, you know, equipment deployed and, clearly, I  
9 make the - it's an extreme example but I have to  
10 resolve that in my personal view by design. I have to  
11 protect the facility under GDC2.

12 MEMBER ARMIJO: The reason I go back to  
13 Fukushima is that the seismic event created the  
14 tsunami. The tsunami flooded the plant. Offsite  
15 power was lost because of the seismic event.

16 So getting to John's point is keep  
17 cranking up the seismics - the severity of the seismic  
18 event. Eventually we get to a condition which may or  
19 may not lead to flooding if you have a big dam that  
20 might fail and lead to flooding.

21 But crank that thing up to a point and  
22 there's some point beyond which you cannot protect  
23 even against - forget the meteorite but there will be  
24 a seismic event beyond which you can't protect and we  
25 ought to be able to state that somehow.

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1                   That's our limit and maybe it's extremely  
2 low frequency. Maybe it's not so low frequency.

3                   MR. REED: Yes. I'm not sure we can  
4 define that. But I understand what you're saying,  
5 yes.

6                   MEMBER STETKAR: I only use the meteorite,  
7 by the way, is it forces people to think differently  
8 from the construct of the things that we've seen or  
9 that we've ostensibly evaluated as very rare, very  
10 severe events and certainly we can't protect against  
11 that.

12                   We might not be able to protect against  
13 less rare events that are quite, you know, that are  
14 less severe than that.

15                   But it's that framework for, I think, you  
16 know, Steve and Mike said the same thing that at some  
17 frequency there might be a large uncertainty in that.  
18 We have to admit that we can't protect against some  
19 hazards and that is a some level of de minimis  
20 acceptable risk.

21                   MR. REED: That would be nice to -

22                   MEMBER STETKAR: And we have some  
23 confidence - as that frequency increases and the  
24 hazard severity decreases we have greater and greater  
25 confidence that we have protection.

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1 MR. REED: In some circumstances of some  
2 of these events I think we could do a pretty good job  
3 and I'm thinking about water, you know, in a case like  
4 where a facility whether it simply is dry and I can  
5 look at everything and I can't get close to it. So  
6 sometimes I can do this.

7 MEMBER STETKAR: Water in some sense is a  
8 little bit more deterministic, if you will.

9 MR. REED: That is. And so you can kind  
10 of get there a little bit of water. Now, the seismic  
11 thing - I'm not - I haven't got confidence in the  
12 seismic thing, to be honest with you, and I know it's  
13 a continuum.

14 But I also know that these facilities have  
15 a lot more ability to withstand that than they even  
16 know because the way they were designed and then  
17 simply procured for stuff that's put in place that was  
18 greater than or equal to what was needed and then you  
19 get like - or a dam rides through it. Even Fukushima  
20 rode through it.

21 You know, so I think that's an unknown too  
22 that's built in. So it's really hard to figure out  
23 where in this continuum you are and how much we can  
24 withstand.

25 MEMBER STETKAR: It's not necessarily

1 unknown. People in risk assessment do evaluate those  
2 fragilities. There are some certainties about them,  
3 you know.

4 So indeed, it's not the notion of the  
5 unknown unknowns, if you will. Structural engineers  
6 have - you know, they know how to do that.

7 There's uncertainty associated with it but  
8 they've evaluated fragilities, the structured systems  
9 and components as a function of applied acceleration.

10 MR. REED: I would hope it was - it would  
11 be applied out of the 2.1 thing though. You know, the  
12 kind of things you're talking about I hope it falls  
13 out of that and we would have our effort and getting  
14 us a little bit more than what they have to. So -

15 MEMBER STETKAR: I mean, in some sense the  
16 limit for a particular plant would be determined by  
17 the upper ends of the fragility curves for the basic  
18 structures and the plant.

19 I mean, if the auxiliary building falls  
20 down or suffers a major - I don't want to say falls  
21 down - suffers a major structural failure such that  
22 the equipment and piping systems are disabled, at that  
23 point it's really difficult to say that providing  
24 electrical power to things or we're trying to shoot  
25 the gaps in the piping system with water. So in some

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1 sense, that type of analysis at least from the seismic  
2 perspective defines for that particular design our  
3 acceptable level of risk or at least a level of risk.

4 MR. REED: In my mind, I kind of see the -  
5 and I'll just make a point of the cliff edge on  
6 seismic is when the seismic category one structures  
7 start to collapse and that, in my view, I don't think  
8 that we can really be successful under the  
9 circumstances.

10 MEMBER STETKAR: That's well beyond the  
11 design basis - well, well beyond the design basis.

12 MR. REED: You might - you might be able  
13 to do some of these things but really the chances are  
14 really diving now for success. You know, so -

15 MEMBER STETKAR: But, I mean, in some  
16 sense of trying to get your hands around what - you  
17 know, in what range from, as you characterize it,  
18 benign losses of all AC power and really severe events  
19 are we trying to provide protection.

20 MR. REED: Yes, I was really glad that -

21 MEMBER STETKAR: Your strategy is you're  
22 operating kind of in that range.

23 MR. REED: I'm just thinking of the old  
24 50.63 benign. I wasn't thinking of anything more than  
25 that so I should probably put that explicitly in there

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1 and I'll get to that here in a little bit too again  
2 some more but -

3 MEMBER STETKAR: Those of us who've looked  
4 ahead knew what you meant.

5 MR. REED: Okay. Also, on the same - we  
6 kind of skipped over but I'll just string to it. The  
7 third bullet there, applying what I call special  
8 treatment assurance requirements, and by the way when  
9 I say special treatment I mean it in 50.69 terms.

10 As some of you know I worked on that for  
11 five years and so that's how I mean it. Of course,  
12 the portable equipment would have to be designed with  
13 a capacity and capability to function and have  
14 function performance requirements that it needs to  
15 have and designed to hopefully tolerate the conditions  
16 under which you're going to ask it to function.

17 I'm talking about not shaking it, not  
18 baking it and not an Appendix B kind of thing. In  
19 other words, an augmented treatment like station  
20 blackouts in this - in this same world it can be  
21 purchased commercial but we're going to have more of  
22 the commercial on it.

23 So that's - this is the way we've been  
24 going with it here. I think that's a sound approach.  
25 We'll continue with that in the rule at this point in

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1 time. It helps keep the costs down somewhat.

2 The costs are pretty large, if you don't  
3 know. I'll agree with this mitigating strategy it's  
4 a factor really large. But nonetheless, that's kind  
5 of where we are right now on augmented treatment,  
6 okay.

7 So I'd love to have it kind of - you know,  
8 going back to this risk idea I'd love to treat it like  
9 a box two thing, you know, risk two - if you're  
10 familiar with 50.69 where you kind of look at the  
11 thing and see what its performance needs to be in a  
12 PRA and then give them that performance.

13 That's how I have to treat it accordingly  
14 but I don't have that PRA so I'm going to have  
15 augmented treatment.

16 For example, if I procure and to have  
17 these little like fire type pumps I'm going to run  
18 that thing, make sure it actually runs and then  
19 periodically, maybe every so often other every - yes,  
20 exactly.

21 Every other refueling or whatever I'm  
22 going to run that thing and make sure it's functional.

23 In other words, it's not going to sit  
24 there and rot for ten years. And so there's going to  
25 be treatment. It has to be functional.

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1 I have to have some assurance level the  
2 thing is functional, available and will actually work  
3 when called upon. So that's what I'm trying to say  
4 there and that's kind of where we're at.

5 So there's a lot in that bullet, a lot  
6 that we're - I think we're going to have to sort out  
7 when we get the responses to the order and see what  
8 people are actually doing and see - and see what we  
9 will accept, okay. That's what that bullet means.

10 MEMBER STETKAR: When you say equipment  
11 qualification I recognize some of the FLEX strategies.  
12 So -

13 MR. REED: 50.49 time of qualification,  
14 for example - EQ, in other words. That's what -

15 MEMBER STETKAR: Seismic.

16 MR. REED: Seismic qualification, shaking  
17 it.

18 MEMBER ARMIJO: Okay. You said 69 or you  
19 meant 49, right?

20 MR. REED: 10 CFR 50.69 special treatment  
21 requirement.

22 MEMBER STETKAR: This notion if it's  
23 reasonably protected, now, I understand if I have a  
24 plant in New York State and my FLEX equipment is out  
25 in Ohio someplace, someplace that I can get to it

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1 within 24 hours by airlift or something like that, I  
2 probably don't need to worry about a seismic event, a  
3 lg seismic event that affects my plant and my FLEX  
4 equipment simultaneously.

5 If my FLEX equipment is a half a mile down  
6 the road from my site I probably need to worry about  
7 that lg event that affects both my FLEX equipment and  
8 my plant.

9 So in that kind of context or equipment  
10 qualification or seismic reasonably protected against  
11 these events, how do I demonstrate that? I mean, you  
12 know, I can't buy a - construct a lg shelter for my  
13 FLEX equipment.

14 MEMBER CORRADINI: But what you're getting  
15 at is, I guess, I was waiting later in your slides to  
16 say if the FLEX is in position A they - that position  
17 has got to be qualified in some -

18 CHAIRMAN SHACK: But most of the time 12-  
19 06 says you're going to store it in a building up to  
20 the SSE. They're certainly ain't going to get to lg.

21 MEMBER STETKAR: Well, I mean, by  
22 definition I don't need it, the SSE, right, in the  
23 licensing space.

24 CHAIRMAN SHACK: No, I think Tim is sort  
25 of going on the notion that if the building is

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1 designed to survive an SSE it's going to survive a  
2 good deal more. But you are beyond design basis at  
3 that point.

4 MR. REED: I don't know how much more.

5 MR. BOWMAN: Well, the other thing is that  
6 the guidance doesn't require them to store it in  
7 buildings or in particular in-house type of building  
8 outside and it's not coupled with the ground.

9 That might be a better place to store it  
10 for a seismic and just for some background  
11 information, the offsite resource centers are going to  
12 wind up being one of them down in Memphis and one out  
13 in Phoenix.

14 CHAIRMAN SHACK: But, I mean, be that as  
15 it may, the 12-06 guidance is aimed towards an SSE as  
16 reasonably protected.

17 MR. REED: That's what we're calling  
18 reasonably protected and that's design basis. So -

19 CHAIRMAN SHACK: That's design basis.

20 MR. REED: - I know where you're pointing  
21 to.

22 MEMBER POWERS: Can I ask a question? As  
23 a good risk person you know all these things, right?

24 CHAIRMAN SHACK: I know everything. I do  
25 have - I do have uncertainty and I can quantify it.

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1                   MEMBER POWERS: Still, as I put my FLEX  
2 equipment in Ohio and my earthquake is in New York  
3 it's a big enough earthquake to damage my nuclear  
4 power plant. Consequently, it's big enough to disrupt  
5 the entire societal structure surrounding my nuclear  
6 power plant.

7                   The civil authorities will respond to the  
8 impact that has on the population. They may well  
9 commandeer every airlift capacity that you have.

10                  How are you going to get your equipment  
11 from Ohio to the nuclear power plant if they have  
12 commandeered all your airlift capabilities?

13                  MEMBER STETKAR: That's an excellent  
14 question and that's something that I hope that - I  
15 hope that NEI and the industry have accounted for  
16 that, that they have their own transport vehicles and  
17 they have the authority to say you can't have -

18                  MEMBER POWERS: They can't have them. The  
19 -

20                  MEMBER STETKAR: Well, that's -

21                  MEMBER POWERS: The civil authorities can  
22 commandeer anything in an emergency, unfortunately.  
23 Well, even the road structure at that point -

24                  MEMBER STETKAR: No, no. You're going to  
25 have to airlift it in in these kind of events. You

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1 aren't going to get there over land.

2 MEMBER POWERS: It seems to me that that  
3 is a conundrum, that I don't know how you - how you  
4 address it in these relatively unbounded things.

5 MEMBER STETKAR: That's one of the reasons  
6 in the level three PRA exercise that we're going  
7 through is trying to make the staff pay attention to  
8 that regional infrastructure issue when they evaluate  
9 the long-term responses both from getting resources to  
10 the plant and in terms of evaluating evacuation, you  
11 know, times and facilities. You know, I don't have an  
12 answer.

13 MEMBER CORRADINI: I guess, Dana, my only  
14 impression is FEMA must have some sort of protocols  
15 about all this - the industrial structures that are in  
16 a region that there would be a protocol to -

17 MEMBER POWERS: FEMA can have any - FEMA  
18 can have anything it wants to. It's what the governor  
19 of the state has. He is the one that can initiate to  
20 commandeer it.

21 MEMBER STETKAR: This would have to be in  
22 some sort of formal agreement I think between Homeland  
23 Security and the each state saying you can't touch  
24 this stuff.

25 CHAIRMAN SHACK: Well, I'm sure they're

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1 discussing that. I mean -

2 MR. BOWMAN: There are discussions and in  
3 particular between the licensees in the industry and  
4 their own civil authorities.

5 They exchange information and in such an  
6 event - it's come up in public meetings we've had with  
7 the industry. They would be providing the information  
8 to the civil authorities on what the impact would be  
9 if their contracted air resources for moving stuff are  
10 commandeered on the potential for resulting in a  
11 severe accident and release of radiation.

12 So it's a balancing that the civil  
13 authorities have to make, of course. But that's kind  
14 of outside of the scope of what we can do.

15 MEMBER POWERS: That's why I asked John  
16 and not you.

17 MEMBER BROWN: Well, doesn't that really  
18 require though if you're looking at the FLEX stuff to  
19 look at even the heavy lift like helos, military heft  
20 capability of heavy lifting some fairly substantial  
21 things into locations?

22 But if you don't have preexisting  
23 agreements and have designed the equipment such that  
24 it can be done, I mean, you can say, well, I need, you  
25 know, a five megawatt generator with auxiliary

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1 associated equipment. It may exceed the capacity of  
2 the - so you have to have multiple smaller units that  
3 you can put together and there has been no mention of  
4 that type of thought process.

5 MR. BOWMAN: That's being considered. The  
6 industry is setting up regional research centers, the  
7 regional response centers, and they're setting up what  
8 they're calling playbooks for how they're going to get  
9 the equipment and what the equipment will be and what  
10 the means of transportation will be.

11 So we'll be looking at that. It will be  
12 very likely open items in the integrated plans that we  
13 get in end of February, beginning of March, because  
14 they aren't on schedule to have the play books  
15 developed until sometime next May or June, I think, is  
16 when that schedule is. So we are looking at that and  
17 they do have contracting in place.

18 But, of course, nothing's on the docket  
19 yet for to deal with delivery of equipment.

20 MR. REED: Should we move on to slide 9?

21 CHAIRMAN SHACK: Why not give it a try?

22 MR. REED: All right. Let's go then.

23 I'll beat this last bullet and last slide again and  
24 we'll be on the first one on this slide.

25 So what I was trying to get to was that,

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1 you know, regardless of the - how you get to this  
2 symptom - the station blackout symptom in the EOP  
3 whether - whatever sequence of events got to you - got  
4 to there, these FLEX support guidelines and those FLEX  
5 approaches mitigating strategies is a very useful  
6 thing for addressing that symptom regardless.

7 And of course, you know, if you've done it  
8 for these extreme events when I meant bounding I said  
9 they're going to be very good for things that are well  
10 within that bound. That's what I was really trying to  
11 say.

12 And so this actually starts to fold in  
13 what we need to do with what's already in there in  
14 50.63 because as you're going to see this is going to  
15 kind of be a backstop to the 50.63 stuff and it's  
16 going to make these guys a lot longer coping than they  
17 are right now as a net result, in my view.

18 So but going back to 50.63 and that second  
19 bullet there, and this needs to be stated, it was to  
20 withstand and recover from a blackout, you know, as  
21 defined there.

22 And that now that was - for those of you  
23 who all know, that was actually a cost justified  
24 substantial safety enhancement rule.

25 Now we have in place this mitigating

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1 strategies adequate protection order. Those are two  
2 different levels of pedigree and so the pedigree that,  
3 of course, is the rules is an adequate protection  
4 requirement.

5 So one of the things, I think, that you'll  
6 see is what we need to make sure the licensees are  
7 aware of is that if you're going to get into a  
8 situation like this with whatever scenario you can  
9 come up with and you look like you're going to exceed  
10 the coping of your - you know, your old 50.63 coping,  
11 let's say, that you're going to be able - you're going  
12 to deploy and having serviced these FLEX support  
13 guidelines for those situations also because that's  
14 really adequate protection and that's the order.

15 And this is a - this is a subtle thing  
16 here. If you're into a licensing space you'd say  
17 whoa, whoa, whoa as an ex-licensing guy. They'd say,  
18 wait a second, the order was for external events - you  
19 know, external event-driven SBOs.

20 This thing over here was not for that. It  
21 was for these, you know, grid-centered, switch yard-  
22 centered and severe weather type situations loops with  
23 multiple failures. How can you apply this, and the  
24 answer is well, if you've got beyond those things,  
25 those 50.63 things and you didn't deploy this you

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1 would no longer have a license after that event.

2 So you, you know, I don't think any sane  
3 licensee would ever do that but one of the things  
4 you'll see, I think, for certain is that there will be  
5 a connector between the current 50.63 and these new  
6 strategies to make sure that's well understood - that  
7 that has to be a - hopefully it turns out to be a  
8 smooth continuous process on how this works and I  
9 think it will.

10 Again, this is really a function of the  
11 feedback on the order and seeing how this is actually  
12 implemented down at a - almost a nuts and bolts level  
13 on how they filled in the FLEX support guidelines into  
14 the EOPs and how that happens and make sure that's a -  
15 that works well.

16 So that's what that's kind of saying. So  
17 the old coping determinations that you go back to  
18 50.63 that were one-time things for the current 104  
19 guides, okay, under Reg. Guide 1.155 those were the  
20 two, four, eight and 16th hour bins and they were  
21 frequency kind of ideas - offsite frequency, onsite  
22 response -

23 MEMBER STETKAR: Liability.

24 MR. REED: Exactly. Those kinds of - that  
25 coping determination really - is really not the driver

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1 anymore, I think. I think this order is going to  
2 become the driver and in fact if you think about it I  
3 think the order is going to - is going to completely  
4 I think kind of stomp all over the top of it.

5 And by that I mean if you look at what you  
6 need to do in terms of this mitigating strategies  
7 order, okay, and you have - you have this event, let's  
8 just say, and you've got, say, three different teams  
9 and the SRO with these teams they're going to team out  
10 and go and get the equipment that's reasonably  
11 protected. You have N plus one sets of this equipment  
12 around and you've got to go get the equipment.

13 Then you got to move from point A to point  
14 B where it's going to be deployed and then actually  
15 deploy it, I mean, it's hoses and cabling and  
16 everything else, that's going to take a substantial  
17 amount of time. There's no doubt in my mind that's  
18 going to take a substantial amount of time.

19 It's going to take a significant amount of  
20 time just to figure out what happened, okay, to  
21 diagnose the situation to assemble a staff and work  
22 you down to the point where you're actually deploying  
23 these people.

24 So this is going to be really the key  
25 feedback in my mind from this next February as to how

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1 much time you estimate you're going to be in this  
2 first situation here that you have to cope with no  
3 power and that will be, in my view, the new coping  
4 duration for everybody.

5 In other words, if you have to add more  
6 batteries or more capacity there that will become the  
7 more - the new, if you will, coping duration for these  
8 facilities. That's what I'm trying to say there.

9 MEMBER STETKAR: Tim, one thing that we  
10 talk about a lot is, and I want to make sure I  
11 understand because I was going to ask you about that  
12 little sub bullet there, we talk about typically in  
13 risk assessment now an available time window within  
14 which you must accomplish something and balancing  
15 against that the amount of time that's required to  
16 perform that action.

17 So, for example, if I have five hours  
18 before I drain a tank of water and I need to get water  
19 into that tank within five hours that's my available  
20 time window.

21 If it - if it takes me - you know, I have  
22 high confidence that I can apply some pumping capacity  
23 to refill that tank within an hour I've got a four-  
24 hour margin.

25 If I do an analysis and, say, I have a 50

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1 percent probability that it's going to take me five  
2 hours and a 50 percent probability it'll take me  
3 longer, I don't have very much margin.

4 I don't have a lot of confidence that I  
5 can actually accomplish that function within the  
6 available time window. I tend to think of coping time  
7 determinations as things in the plant that define my  
8 available time windows.

9 So for a pressurized water reactor I have  
10 several different competing concerns. I might have  
11 boiling off steam generators. I might have  
12 development of reactor coolant pump seal LOCA.

13 I might have loss of DC power to control  
14 the turbine-driven emergency feed water. You know, I  
15 have several different things that determine time  
16 windows within which I can restore a particular  
17 function.

18 And then in terms of evaluating my  
19 confidence in successfully restoring that function, I  
20 need to look at the feasibility of restoring that  
21 function within each of these time windows and the  
22 implications of whether I don't.

23 I thought that what I heard you saying is  
24 that you're looking at this timing issue in terms of  
25 the implementation time - how long does it take to

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1 actually move the equipment from point A to point B,  
2 plug it in, crank it up, get the pump running.

3 MR. REED: Right. And then look at what  
4 you can actually do today. Let's say that's 16 hours,  
5 and right now I can only hang in there for three  
6 hours. I got a big problem.

7 MEMBER STETKAR: That's right. Okay. So  
8 we're kind of saying the same - in my mind, that  
9 coping time - in principle the coping times under the  
10 50.63 requirements took into consideration all of  
11 those things that I'm calling an available time  
12 window.

13 For my particular plant as long as I  
14 restored power within two hours, AC power two hours,  
15 I wouldn't trip over any undesired situation.

16 MR. REED: Right.

17 MEMBER STETKAR: Okay. So those - in that  
18 sense they're still relevant because -

19 CHAIRMAN SHACK: But the coping time the  
20 way it's calculated in the Reg. Guide is why I think  
21 what he's saying is sort of not meaningful anymore.

22 MEMBER STETKAR: That's correct. It's  
23 going to - it's going to set the coping time as -

24 MR. REED: Because now it's a real  
25 analysis of the situation now.

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1                   MEMBER STETKAR: Right. And they would be  
2 able to deploy this equipment and get it going.

3                   MR. REED: It's a whole different thing  
4 now.

5                   MEMBER STETKAR: It's a different - it's  
6 a -

7                   MR. REED: And I kind of view it as like  
8 a time line, you know. The thing happens and maybe  
9 the first thing I'm doing is stripping batteries.

10                   Maybe the next thing I'm doing is  
11 ventilation for turbine driven aux feed water pump,  
12 for example, and maybe the next thing is filling CST,  
13 you know, and it goes down to these things and these  
14 are the critical things I need to do and this is where  
15 I need to have portable equipment. Can I do those  
16 things?

17                   How long is it going to take? How much -  
18 how can I withstand those conditions with no AC power  
19 and do I need now to beef up my batteries, whatever,  
20 and that's - this is really, I think, the core of  
21 getting the feedback from the order.

22                   And I think the net result will be that  
23 these guys are going to have to withstand for a much  
24 longer period of time this blackout condition.

25                   And so it will become - to deal with the

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1 fact of coping. Now, unfortunately, I think they may  
2 take actions that are more extreme than they would  
3 have taken in the past in terms of, like, battery  
4 stripping, for example.

5 They may go down to one channel and that's  
6 it. You know, whatever they have to do because  
7 they're trying to hang in there as long as possible  
8 and that's - that could be an issue too, okay, versus  
9 the - what they -

10 CHAIRMAN SHACK: And that's what you'll  
11 have to see when these - when these implementation  
12 things come back is if they're really going to do  
13 that.

14 MR. REED: Yes. Exactly.

15 CHAIRMAN SHACK: I want to take a break  
16 now for 15 minutes and come back. So we'll be back at  
17 10:20.

18 (Whereupon, the above-entitled meeting  
19 went off the record at 10:04 a.m. and resumed at 10:21  
20 a.m.)

21 CHAIRMAN SHACK: Sort of where we were,  
22 you know, I think part of the concern that I had and  
23 that Harold had, you know, you sort of mentioned that  
24 in order to make some of these current coping times -  
25 now, these guys are going to be stripping everything

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1 off and that's where one might see a modification of  
2 the current 50.63.

3 I mean, you know, do you need more  
4 installed capacity in the terms of more batteries, you  
5 know, a diesel battery charger or a steam-powered  
6 battery charger that doesn't make you, you know, go  
7 down to the last volt off of that battery before you  
8 can get this equipment in there.

9 And that's somewhere where I would sort of  
10 see a potential for, you know, changing the current  
11 regulation to match up better with your capability  
12 here to stretch that time out. And again, a robust  
13 alternating AC would give you that plus more.

14 MR. REED: Yes. Exactly. That's what I  
15 was trying to say. I think once they figure out a way  
16 on the phase one portion of this - of the order to  
17 tolerate that condition for as long as they have to I  
18 think - I foresee that they would do - it might take  
19 pretty extreme stripping, you know, actions and this  
20 is the battery guy here and that's one of our  
21 concerns.

22 But, additionally, hopefully they'd beef  
23 it up, you know, and they actually have better  
24 charging of, you know, portable sources or whatever  
25 they need to do or had more batteries or whatever and

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1 that would be true physical modifications that really  
2 enhance the 50.63 situation.

3 You know, what - you know, we've mentioned  
4 earlier about how it's that's 1E to the minus 5 is an  
5 estimate of the core damage. So it would drive that  
6 down, in my view, down well below that if in fact  
7 those changes happen and I think they will happen.

8 But I don't know that for certain right  
9 now. I see that down the road but, yes -

10 CHAIRMAN SHACK: But just, again, talking  
11 about what you might be doing in terms of the rule.  
12 I mean, I think - you know, it's hard to see, you  
13 know, beyond design basis conditions, you know, the  
14 FLEX - the performance base sort of gets there.

15 But it is that initial installed capacity  
16 that I think, you know, we need perhaps to consider.

17 MR. MCCONNELL: And this is Matt  
18 McConnell. But one of the concerns or challenges that  
19 we have is just trying to understand what the industry  
20 is going to present when they come in with their  
21 implementation plans and we're hearing a lot of these  
22 things they might be trying to do.

23 And they might be acceptable solutions or  
24 alternatives but until we actually see what they're  
25 going to do and if they're feasible we'll have to wait

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1 until that time.

2 I mean, I have some concerns of whether or  
3 not the operator is going to say okay, take away my  
4 indication on half of this equipment or my control on  
5 half of this equipment just to save my battery and now  
6 I'm down to one set of indications. I don't know. I  
7 mean, I guess we'll find out come February or March  
8 time frame this year.

9 MR. CHECK: And so the staff will have to  
10 say and do what the industry can or should do.

11 MR. REED: So on slide 9 now - I'm on the  
12 third bullet - and this is the design flexibility.  
13 This was - we got plenty of interactions on the ANPR  
14 and we've had new designers. I think it was very  
15 valid. I want to try to build in some design  
16 capacity.

17 You just mentioned, in fact, robust  
18 alternating AC as one idea and I think that would be -  
19 it would be - it would be very good for us to have  
20 that flexibility built into this rule.

21 I mean, as - you know, I'll come to this  
22 probably more than once but around the schedule right  
23 now we're having a hard time doing that. But you can  
24 always have alternatives and exemptions to rules and  
25 to the word too and we can get that.

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1           It's not the best situation but right now  
2 I think that we would probably view these things more  
3 as built-in engineering capacity for that first phase,  
4 you know, and that's kind of where we've heard these  
5 discussions and I think they're really good ideas that  
6 I -

7           CHAIRMAN SHACK: Oh, yes. You need a  
8 robust alternating AC. I don't think you'd get away  
9 from this.

10          MR. REED: You don't get away from this  
11 but when you put in a robust alternating AC for the  
12 other, let's say the other 50 percent that don't have  
13 an AAC, I just took that station blackout residual  
14 risk and eliminated it. You know what I'm saying?

15           You know, so I see that as - it's, yes, I  
16 hear, for instance, it's got a mixed ability that  
17 really addresses the situation. It does a great thing  
18 for that other set and it may do great things other  
19 places where people don't even realize it.

20           You know, if you're an old facility and  
21 you really don't have very good source - a decay heat  
22 removal sources of water or, you know, I'm going to go  
23 to, like, say an old two loop plant, you know, and  
24 you've got basically high-end G line break issues or  
25 missile issues or seismic category one issues with

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1 your suction sources and you go and you build in  
2 something pretty hard and you'll see this coming up  
3 here like a seismic category one source of water for  
4 24 hours, a motor-driven aux feed water pump with its  
5 own power supply bunkered, well, you've not only done  
6 good things for this because you have a, I'll say a  
7 hardened core decay heat removal pump, but for that  
8 facility it addressed probably missiles, high-end G  
9 line breaks, block walls, seismic - you did a lot of  
10 things for that pre-GDC plant, okay, in this  
11 particular case.

12 And so sometimes these things have a lot  
13 of benefits depending on your vintage of your facility  
14 that weren't intended by this order and robust  
15 alternating ACs is one. It goes directly to the 50.63  
16 residual risk.

17 So anyway I'd like to - I think we should  
18 all, going back to this bullet here, the engineered  
19 ideas, I think they would help us and I think we'll  
20 see some of this.

21 I mean, we're seeing a little bit of it  
22 right now and I think we'll see some more of it. I  
23 think when it gets to the actual actions that people  
24 must take I think they're going to have to have some  
25 help.

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1           Now, we went out to Diablo Canyon and  
2 talked to those folks. They're really doing a lot of  
3 good work, and you look at what they have to do and  
4 where they have to move the equipment to and how heavy  
5 that equipment is and how far off it's got to go,  
6 they're going to need winches and those kinds of  
7 things, I think, to be successful.

8           And so there's some small engineered  
9 features I think you'll have to get into at least and  
10 then I think we'll have a variation of those kinds of  
11 engineered approaches for the phase one part.

12           But, again, coming back I think the  
13 flexible stuff makes sense. You'll still have some of  
14 that no matter what, I think, you know, because that's  
15 a good diverse approach to try to address these  
16 issues.

17           So going to the last part of this slide  
18 then, talking about the mitigating strategies too,  
19 this is another concept that I want to try to get  
20 across and in fact this was actually built into the  
21 NEI guidance in 12-06.

22           They went back and they looked at the Reg.  
23 Guide 1.155 guidance and that referenced NUMARC 8700  
24 and in there you go in there and you'll see some of  
25 the coping strategies built into NUMARC 8700, for

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1 example, ventilation, and going and opening doors and  
2 trying to deal with no AC - AC power and what that  
3 means, really, in steam rooms, for example. So they  
4 went back and they built that in. They linked it in  
5 right into the guidance because that makes perfect  
6 sense.

7 If you want to think about it, in NUMARC  
8 8700 it was kind of built around a four-hour coping  
9 duration and trying to handle that situation and it  
10 looked like people kind of like if I'm going beyond  
11 four hours I'm just going to go and get an alternating  
12 AC source and fire up that whole 4160 bus and not  
13 worry about it anymore.

14 Now, what we're doing is saying, now you  
15 can't get the power back. It's going to be going on  
16 and on and on. So now you got to worry about, say,  
17 ventilation.

18 I got to worry about when my safe storage  
19 tank gets empty and getting water sources and the best  
20 water sources I can to build that thing again.

21 So that's a major, major part of this  
22 effort, knowing what my water sources are, where they  
23 are, where I need to have the portable pumping  
24 capacity and moving it, okay.

25 So the strategies become much tougher

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1 eventually because I'm in this thing for a while. I  
2 have RCP seal leakage, okay, for PWRs. That becomes  
3 a real issue.

4 I'm going to have to put inventory back  
5 into the RCS. I may even be getting into criticality  
6 issues, okay.

7 So this is for this - this is a much  
8 tougher situation to deal with but it kind of goes on  
9 a continuum starting with the blackout for four hours  
10 in the 50.63 and now we're just going to get - it's  
11 getting a lot nastier due to duration and severity and  
12 the conditions that could exist there.

13 So the guidance that was built into 12-06  
14 started with that and extended it and that makes  
15 perfect sense, and I'm just - I'm noting that here  
16 that that's also underlying this regulatory framework  
17 that will be - we'll put in place here so -

18 MEMBER SIEBER: Have you gotten any  
19 feedback from industry about the duration of RCP pump  
20 seals?

21 MR. REED: I'm trying to think. Did you -  
22 I think this is the PWRs and how long - this is how  
23 long they'll last and yes, I remember hearing numbers  
24 - 55 hours and - I can't remember.

25 MR. BOWMAN: Fifty-five hours before it

1 transitioned into phase so natural circulation can  
2 occur but I haven't seen the actual -

3 MEMBER SIEBER: The old seals would leak  
4 up to 200 GPM after four hours.

5 MR. REED: Yes. Even the low leakage ones  
6 aren't that great, as I remember. Somebody -

7 MEMBER SIEBER: That's right.

8 MR. REED: Yes, and that issue came up  
9 already. I think they put them in one plant and  
10 tested them and it didn't work and so there's some  
11 issues there. That's actually part of that analysis  
12 right now is what is that leakage, right, and when do  
13 you really need to be concerned.

14 For example, and this is a real challenge,  
15 by the way, for you guys. I'm sure you know this but  
16 trying to get water into the reactant coolant system  
17 on a PWR and this circumstance is difficult.

18 And, for example, you may have to go into  
19 vetting drain lines and a bunch of them with something  
20 like - and if you're getting this big - this is going  
21 to be a high energy pump probably from offsite -  
22 that's going to take a while, for example, or you're  
23 going to have to power up a motor control center for  
24 the charging pump, for example.

25 MEMBER SIEBER: Yes. An offsite pump, as

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1 I pictured, is not a practical solution to this.

2 MR. REED: I think - I think you might be  
3 right. I don't - again, I'm not confident with the  
4 situation what it's going to turn out to be. This -  
5 again, more feedback. But I see this as the really  
6 toughest strategy there is, I think.

7 MEMBER SIEBER: Yes, I think so too  
8 because it's going to take a whole new design effort  
9 and it's just not going to happen quickly.

10 MR. REED: I mean, I've heard one idea  
11 about, you know, trying to bring in - I forget the  
12 size - it was a couple megawatt, you know, source, to  
13 power the motor control center to use - I think in  
14 this case it was a positive displacement. But they  
15 had a positive displacement pump as opposed to a  
16 centrifugal charging pump.

17 But, you know, using infrastructure there  
18 to power up that pump and then with that get the water  
19 to that thing and then restore the inventories of the  
20 RCS because you're going to lose inventory. There's  
21 no doubt about it.

22 In addition to that, we've heard - I asked  
23 this question too is what do you think the deal is  
24 with the criticality and, you know, in terms of how  
25 much boration do you need.

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1 Do you need to add borate to water and so  
2 far it looks like in those analyses that if you get a  
3 cumulating injection that's got a PPM in there, you  
4 know, a boration that that looks like that would be  
5 okay, good enough, you know, but -

6 MEMBER SIEBER: If you could depressurize  
7 -

8 MR. REED: - for some - for some design.  
9 So it's both inventory and boration and criticality  
10 issues that we'll be concerned about.

11 MEMBER SIEBER: Technical problems -  
12 technical problems here, to me, are severe and -

13 MR. REED: Yes.

14 MEMBER RAY: Well, just worry about  
15 maintaining natural circulation with no level control  
16 and no pressurizer either, for example.

17 MR. REED: Yes.

18 MEMBER RAY: Bubble on the head. It's a  
19 mess.

20 MR. REED: And if you get, for example,  
21 until I get the nitrogen over from the accumulators in  
22 there and any condensables and the heat transfer it  
23 really gets to be nasty too. So that's another issue  
24 -

25 MEMBER RAY: That's if you depressurize.

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1 MR. REED: Yes.

2 MEMBER RAY: But you're likely to go the  
3 other way.

4 MR. REED: You could go the other way.  
5 And then you've got issues with safety valves and yes,  
6 I've - that's the ongoing analysis that's underlying  
7 this stuff - that it's not trivial at all.

8 MEMBER RAY: No, it's not. But just be  
9 realistic about it.

10 MR. REED: But we're trying to - we're  
11 trying to do something in terms of having an  
12 engineering analysis for these things that at least  
13 there's something that makes sense, try to understand  
14 whether these actions have to be taken, okay, first of  
15 all, and what kind of filler rates that we need so we,  
16 you know, have more than sufficient there.

17 So that's the idea, you know, to have a,  
18 again, some assurance that these things would be  
19 workable and actually achieve what they're trying to  
20 do - maintain or restore this function so -

21 MEMBER RAY: Great. Thank you.

22 MR. REED: Sure. So getting to the kind  
23 of where we're at now on the draft rule and trying a -  
24 from a regulatory rule maker centric standpoint,  
25 whether I think that we can do or what we need to do

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1 and how we're going to do that in terms of changing  
2 the regulations.

3 We have the order, of course, and I've  
4 mentioned in the beginning the order and the rule  
5 making are almost right on top of each other, kind of  
6 the same thing.

7 And so the order is my - if you want to  
8 know, my driver for my entire rule making and so those  
9 provisions were, of course, imposed on the current  
10 licensees, the data protection provisions and in the  
11 EA-12-049.

12 So I would put those into the federal  
13 regulations, you know, in part 50, part 52 and do that  
14 with the full recognition that I have at least two  
15 other sets of regulations in place right now.

16 Of course, 56.03 but also I had  
17 50.54(hh)2. They both are related to what I'm trying  
18 to do. So I need to do that within that context and  
19 recognize that those are there.

20 So right now I feel as though everything  
21 we need to do can be done through making those orders  
22 or requirements, I'll say, generically applicable,  
23 okay, and that I'm not - I'm not intentionally  
24 intending to go and, for example, go beyond the orders  
25 and try to backfit something in addition to the

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1 orders.

2 To be quite honest with you, I'm not sure  
3 how you can do more than what was asked in the order.  
4 The order asked for maintaining and restoring core  
5 cooling - spent fuel pool cooling and containment for  
6 beyond, as I mentioned, external events.

7 I don't know if you can - as we mentioned  
8 earlier, you can even achieve that for some of these.  
9 Certainly, you can't ask for more than that. So that  
10 - it's hard to go beyond that. But that's - so that's  
11 what we're starting with. So what we're talking about  
12 then is that -

13 CHAIRMAN SHACK: Just as rule making kind  
14 of thing, we actually got some grief once upon a time  
15 when we went to 50.46b and we tried to put in a  
16 performance-driven cladding requirement and they told  
17 us, you know, in an adequate protection rule that you  
18 really had to have something enforceable.

19 Now, you're going to write an adequate  
20 protection rule that says for all beyond design basis  
21 events. You think you're get away with that?

22 MR. REED: Only way I'm getting away with  
23 it is because it was already done in the order.  
24 That's the answer. And I -

25 CHAIRMAN SHACK: I'm sticking with it.

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1 MR. REED: Yes, it is my answer and I  
2 don't like - that's why I started off I don't like  
3 unbounded requirements and, yes, and it goes directly  
4 to - you called these adequate protection.

5 What do they really mean? How do we  
6 inspect a force against and decide what's success and  
7 that's a very - that's pretty prechallenging, let's  
8 just say - I'll say it that way - to do that in the  
9 circumstance.

10 MEMBER CORRADINI: But you started all  
11 this off at the beginning saying that it'll be in the  
12 guide and therefore for this one it's exempted from -

13 CHAIRMAN SHACK: Well, that's what we  
14 tried to do with 50.46(b). We told them -

15 MEMBER CORRADINI: His memory is actually  
16 what I remember is we tried that and staff beat us  
17 down saying that's just not -

18 CHAIRMAN SHACK: Well, no, no. They  
19 finally bent. I mean, that was such a tiny little  
20 performance-driven requirement. This one is a whole  
21 lot bigger.

22 You know, we were dealing with a very,  
23 very defined event where you could go off and measure  
24 that performance in a very explicit way with, you  
25 know, tests and stuff. This one, boy, beyond designs

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1 -

2 MR. REED: I think it's changed. I think  
3 the paradigm has changed and I'm not sure I like the -

4 CHAIRMAN SHACK: Okay. You're going to  
5 drive the truck through the gap, right? So that's -

6 MR. CHEOK: Advice of counsel from OGC.

7 MR. WEISMAN: Well, you're correct that  
8 there are some issues with enforceability of the rule.  
9 We are - we are working - we are trying to resolve  
10 that to make the rule more enforceable.

11 We are proposing requirements that will  
12 apply to the equipment that's going to be relied on,  
13 you know, certain things like independence, and maybe  
14 I'm stealing the staff's thunder here.

15 Matt, I don't know if you want to talk  
16 about that. But independence and - what else is  
17 there? There's that -

18 MR. MCCONNELL: You'll have separation -

19 MR. WEISMAN: Yes, separation.

20 MR. MCCONNELL: - redundancy and all that.

21 MR. WEISMAN: Right. Independence.

22 Right. Redundancy. So there's going to be  
23 requirements on the equipment. That's certainly  
24 enforceable.

25 To the extent that a licensee has to write

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1 procedures and have plans in place as to how we're  
2 going to deal with these emergencies whether those  
3 things are adequate and whether they exist, that will  
4 be enforceable.

5 That may be as far as we can go.  
6 Certainly, if the emergency happens and it doesn't  
7 work and maybe there's not really any point in  
8 enforcing - taking enforcement actions. But -

9 MR. REED: This gets back to that success  
10 criteria in the beginning and what do we call success,  
11 writing toward success and that goes right to  
12 enforceability and inspection.

13 And because, you know, I think I said back  
14 then is that you could have a perfect mitigating  
15 strategy, if you want to think of it perfect, and then  
16 the event was just simply too extreme and the  
17 meteorite hits, you know, and you're not going to  
18 mitigate it.

19 You know, so when you have unbounded  
20 events it's really tough to deal with the situation.  
21 So that's a very good point. That's something I  
22 certainly understand. It makes the rule making and  
23 made the order - it makes all of this very challenging  
24 to do. We did it - the only other place I know we did  
25 it was in 50.54(hh)2 and that's -

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1 CHAIRMAN SHACK: But at least that was an  
2 adequate protection question.

3 MR. REED: It was actually justified as  
4 adequate protection under the power regs security rule  
5 making.

6 CHAIRMAN SHACK: Okay.

7 MR. REED: I didn't like that either  
8 personally. It was adequate protection according to  
9 the ICM order of 2002. So that's - might be a bad  
10 section so -

11 MR. WEISMAN: I forgot to introduce  
12 myself. I'm Bob Weisman from the Office of the  
13 General Counsel. I am on detail to the operating  
14 reactors but I'm working on this rule making.

15 MR. REED: Yes. Bob's my - the lawyer so  
16 -

17 CHAIRMAN SHACK: Okay. So if you didn't  
18 fulfill that - drive through the same gap, yes.

19 MR. REED: Yes. So that's where we're -  
20 so in terms of the rule maker space I'm not going to  
21 activate anything more. That's already now been  
22 imposed. So that's a - at least it makes it a little  
23 bit easier from a process standpoint for me.

24 It's not - it's not a good situation but  
25 that's from a process standpoint where I'm - I think

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1 I'm going to be. In terms of what they're going to do  
2 with taking these orders requirements and what they  
3 mean in terms of touching on 50.63 is what this slide  
4 kind of goes to.

5 What we're really saying here is that, you  
6 know, if you get to a loss of all AC power condition  
7 the bounding, thus limiting the situation and  
8 requirements, really stem from the order and if you're  
9 going to exceed those for that SBO duration because  
10 you had them 50.63 these apply and I think you're  
11 going to see that right now we would have a connector  
12 right in there to make sure that licensees understand  
13 that and in fact they are doing it that way.

14 So I think this is a - this is a good  
15 thing. They're building the EOPs and FLEX support  
16 guidelines in this fashion so this should work.

17 And as I mentioned also previously, the  
18 old coping durations under Reg. Guide 1.155 are really  
19 going to be, I think, outmoded.

20 I think we're going to be in a whole  
21 different world and once they have this phase one  
22 duration figured out and how they're going to tolerate  
23 that and that'll be kind of their new coping, if I did  
24 - now, I'm pulling this out in the last bullet here  
25 because this was a consistent comment on the ANPR

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1 across all of the industry and the industry was don't  
2 touch 50.63. Leave it alone. It's been great,  
3 successful.

4 And I feel like I have to touch 50.63  
5 because from a clarity standpoint if I don't do  
6 anything to let licensees know that hey, this is not  
7 your only requirement in terms of blackout, I'm not  
8 saying anybody would do this but you could foresee a  
9 situation where a licensee says, I got a grid - a loop  
10 on my grid.

11 It's going on for, you know, a long period  
12 of time. It's a bad day. Both my digitals fail.  
13 Hey, I'm just a four-hour plant. I'm not going to do  
14 anything, right. It was a 10 percent chance under the  
15 old 50.63 rule that we get the core damage. I'm just  
16 meaning 50.63.

17 Obviously, that's not the circumstance and  
18 you've got to go to FLEX support, FLEX guidelines and  
19 the mitigating strategies and that's what this is  
20 making clear, and that's in fact I'm sure what  
21 everybody's going to do.

22 MEMBER SKILLMAN: Tim, as you explain  
23 this, seems to me that you've got some fairly well  
24 defined outcomes at least conceptually in your mind.  
25 Where do you think we're going to end up in bullet two

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1 here?

2 When you say we're going to have durations  
3 different than what are presently considered  
4 appropriate in 50.63 where do you think this is really  
5 heading?

6 MR. REED: I'd say that's a really - you  
7 mean in terms of what they'll actually end up being,  
8 how long they'll be?

9 MEMBER SKILLMAN: Talking 72 hours, 240  
10 hours, ten days?

11 MR. REED: I think more like 16 and plus.  
12 I don't know. What do you guys think of 16 and -

13 MR. BOWMAN: What I have heard industry  
14 talking about is some plants think they can get to 72  
15 hours, some plants about 16 hours, using a lot more  
16 aggressive load stripping and considering things like  
17 using nonsafety related batteries and so forth as a  
18 means of extending the battery life.

19 There is a study going on battery life -  
20 Matt can probably speak further to it - for longer  
21 durations with longer established load profiles. We  
22 haven't seen the outcome of that yet, have you?

23 MR. MCCONNELL: No, we have not. The  
24 Office of Research is actually performing a battery  
25 study as we speak with Brookhaven National Labs.

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1           They are taking existing known used Class  
2           1E batteries from three different vendors and they're  
3           working with industry, with EPRI and with NEI, to  
4           develop profiles that would be a reasonable approach  
5           to see how long these batteries can actually survive  
6           if you put them under a different extreme  
7           circumstance.

8           Because a lot of the testing and a lot of  
9           the initial thought process with the lead acid  
10          batteries that the plants use was that they generally  
11          were not going to last beyond eight hours at worst  
12          case scenario.

13          So what they're trying to see is if these  
14          batteries, if they're drawn at a lower current using  
15          a lead calcium design, if they could actually make it  
16          out to 72 hours and potentially be able to be  
17          recovered after that point as well, and that study is  
18          really in the initial phases.

19          But I believe they've actually started the  
20          testing. I just don't know the results of that  
21          testing.

22          MEMBER SKILLMAN: Do you have any inputs  
23          from the practitioners, people at the plants who've  
24          made an error and said gee whiz, we should have - we  
25          should have done something and we let those discharge

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1 longer than we had anticipated and gee whiz, they're  
2 not as bad as we thought they were. Do you have any  
3 input like that?

4 MR. MCCONNELL: No, but - no, I have not.  
5 But I know that there are a lot of the IEEE members in  
6 the stationary battery committee that are  
7 participating in this study who are - happen to be,  
8 you know, the workers at the plant that actually do  
9 the discharge testing and such.

10 So there's a lot of knowledge base that's  
11 going into this effort and I think a lot of the  
12 lessons learned are also going to be pulled into it.  
13 So I'm kind of encouraged on what, you know, to see  
14 what we - what comes out of this.

15 It just a matter of time, I guess, and it  
16 may - it may be and I don't want to speculate too much  
17 but they may be complete by the end of, say, in the  
18 summer of next year with their - with their testing.

19 MEMBER SKILLMAN: Thank you.

20 MEMBER SIEBER: That still only takes you  
21 to what, 16 hours, right?

22 MR. MCCONNELL: No. Actually they're  
23 doing - they're doing testing for various stages.  
24 They're going with various assumptions and various  
25 profiles from everything from 16 hours to 72 hours.

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1 MEMBER SIEBER: But they're extending the  
2 life by changing the load profile.

3 MR. MCCONNELL: Correct, and there are  
4 different assumptions on the amount of equipment or  
5 the shedding that may be required. Basically, they're  
6 trying to narrow it down to the absolute bare  
7 essentials - what does the operator need in order to  
8 ensure the safety of the plant.

9 MEMBER SIEBER: And so will all the  
10 stripping of the battery to extend the life be done by  
11 manual operation?

12 MR. MCCONNELL: Yes. And there - I think  
13 there are different profiles that I have seen. I  
14 think the majority of them don't credit shedding until  
15 - load shedding until after two hours or so.

16 So it actually gives you time to do that  
17 because it does take time to do the load shedding.

18 MEMBER SIEBER: I'm glad I'm no longer an  
19 operator.

20 MR. REED: Yes, there's a lot of  
21 substantial stripping. That's a lot. So that's what  
22 I was -

23 CHAIRMAN SHACK: Just an NRO but can we  
24 get a copy of that report - the battery report?

25 MR. MCCONNELL: The final report or -

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1 CHAIRMAN SHACK: The final is not -

2 MR. MCCONNELL: The final is not going to  
3 be complete probably for another year. I would say  
4 that the plan may be available but I'd have to talk  
5 with my research counterpart whom I actually have a  
6 meeting with this afternoon.

7 So I will see if I - if that is available  
8 and if it is I will try to get it over to you as soon  
9 as possible.

10 MR. MCCONNELL: Thank you.

11 MEMBER SIEBER: And if the testing fails  
12 that means installing another set of batteries?

13 MR. MCCONNELL: That may be the strategy  
14 is if the testing is not able to demonstrate that  
15 these batteries can survive that long then they may  
16 have to go to another measure which may include  
17 installing additional capacity.

18 MEMBER SIEBER: Okay.

19 MEMBER SKILLMAN: It could be just as a  
20 matter of adding 20 percent more cells.

21 MR. MCCONNELL: Well, the problem with  
22 that is that the rooms are very restrictive in size  
23 and if they already purchased the largest batteries  
24 they possibly can they take up design margins that  
25 were chewed up with the fire protection aspect, in

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1 other words so -

2 MEMBER SKILLMAN: Thank you.

3 MR. REED: So anyway so this - slide 10  
4 was just me trying to tell you all that I will touch  
5 upon 50.63. I think I'll - we'll have something there  
6 and we'll have the link over to the new strategies for  
7 certain.

8 At one point, going on to slide 11, you  
9 know, we were - we were actually thinking about trying  
10 to do something more elegant and try to maybe combine  
11 this thing into one.

12 You know, it'd be nice if you had one  
13 loss of all AC power rule and then sort of design  
14 basis then - beyond design basis with one set of  
15 guidance but I think on this, frankly, I know on the  
16 current schedule we simply can't even come close to  
17 doing that.

18 So right now it's going to be something  
19 less elegant with a connector between the current  
20 50.63 to the new mitigating strategies and then the  
21 same would go with the Reg. Guide, you know, where the  
22 Reg. Guide 1.155. If you're a new reactor and you're  
23 doing this coping it would say hey, fine, do the  
24 coping but also, you know, you have to do the  
25 mitigating strategies and that may in fact be a whole

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1 different situation in terms of what your coping  
2 really will be.

3 So that's not a - that's not a great  
4 situation but one of the problems that we were  
5 concerned about and I think everybody should be  
6 concerned about is there was, you know,  
7 extraordinarily good things that happened out of 50.63  
8 in terms of safety enhancements.

9 That was demonstrated in NUREG-1776 and  
10 the alternating power sources, you know, 50 percent -  
11 roughly 50 percent of the guys out there have it -  
12 that was probably the best thing that happened and we  
13 didn't want to lose that.

14 Going back to the mitigating strategies,  
15 remember in the mitigating strategies is always  
16 assuming hey, all your AC power sources, poof, went  
17 away and now you've got to do it with just the  
18 portable equipment and you install capacity and  
19 portable equipment and everything, and you could - you  
20 could foresee a situation where somebody then builds  
21 out that capacity to do that, builds all this thing in  
22 and says I don't need the alternating AC anymore.

23 And the fact is is that's the  
24 preferential, much better source of power that fires  
25 up the entire train. It's better by every, you know,

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1 measure, okay, and you'll want to keep that.

2 So we wanted to keep the alternating ACs  
3 power sources in and the easy way to do that is leave  
4 50.63 in place. And, of course, another great thing  
5 about 50.63 was, indeed, as Mike mentioned in the  
6 beginning, was the emergency diesel generator  
7 liabilities were enhanced and it's now in the  
8 maintenance rule and ROP but -

9 CHAIRMAN SHACK: Well, that was sort of my  
10 thought is you didn't need 50.63 any more for EDDG  
11 because you had the maintenance -

12 MR. REED: We've had those other - yes,  
13 there's other - another framework they can capture  
14 that. So you could probably do that.

15 But there would be - I'd have to sort  
16 through that and make sure of that because that's such  
17 a good thing and we actually have - correct me if I'm  
18 wrong but we have reliabilities on the alternating AC  
19 power source also.

20 So that's - those are good things to have  
21 those things being reliable machines and, of course,  
22 you know, make sure that it drives down the frequency  
23 of getting this blackout condition. And so, again,  
24 very -

25 CHAIRMAN SHACK: The preferable power

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1 source and, you know -

2 MR. REED: Absolutely. Absolutely. And  
3 most of these events, of course, won't go - won't be  
4 beyond design basis. They'll be the much more- the  
5 much more probable normal sequences, if you will.  
6 These are not normal.

7 They're all pretty remote. But those -  
8 these kinds of devices will in fact solve the - solve  
9 the problem while there's still power and you won't  
10 get the blackout.

11 So we wanted to keep that in place and  
12 this is the way we're doing it and it's kind of a -  
13 right now the snapshot is it's kind of a band-aid  
14 approach if you want to look at it that way in terms  
15 of rule making.

16 And this is going back to the last one of  
17 the slides.

18 CHAIRMAN SHACK: But how are you going to  
19 keep the alternating AC in? You're not going to  
20 really give them any credit for it anymore, right?

21 MR. MCCONNELL: For meeting the station  
22 blackout rule.

23 MR. REED: Yes, for meeting the station  
24 blackout rule -

25 CHAIRMAN SHACK: So you're going to

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1 compute a coping time for that but there's another  
2 real coping time over -

3 MR. REED: That's right.

4 CHAIRMAN SHACK: Okay.

5 MR. MCCONNELL: Unless they're able to  
6 demonstrate that they were able to make that  
7 alternating AC source robust. And even so, they'll  
8 most likely have to have some sort of coping specified  
9 duration that they have to survive until they get that  
10 up and running.

11 One of the - I know the question was asked  
12 earlier about what we perceive to be deficiencies with  
13 the existing station blackout rule and I think one of  
14 the aspects was the fact that an alternating AC source  
15 could be the other unit's diesel generated because it  
16 was considered that based on the reliability factor  
17 that you only had one unit that was affected at a time  
18 and I think that's where the mitigating strategies  
19 aspect comes into play because that assumes a site  
20 wide event and it does not assume a credit for the  
21 alternating AC source. So you would not be able to  
22 credit the other unit's diesel generator.

23 So in that type of situation those plants,  
24 unless they have some sort of alternate - robust  
25 alternating AC sources demonstrated to us or

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1 additional, I guess, measures in place that they would  
2 have to have a coping strategy at that point to  
3 satisfy that part of the rule.

4 So I think that covers one of the - I  
5 guess I don't want to call it a staff concern but it  
6 was one of the issues that I think that was raised in  
7 the comments that came in to us in response to the  
8 ANPR.

9 MEMBER BROWN: Isn't that different then  
10 from - I was just reading 10 CFR 50.2 where that gives  
11 full credit to - at least it says that definition of  
12 SBO gives full credit to the alternating AC source.  
13 Are you going to have to do something else with that  
14 rule?

15 MR. MCCONNELL: We may - we may have to  
16 revise the definition and that's something that's  
17 under consideration at this time.

18 MEMBER BROWN: Okay. So it's very  
19 convoluted relative to some of these - integrating  
20 those with some of these other rules that are - that  
21 are around.

22 MR. MCCONNELL: Yes.

23 MEMBER SKILLMAN: At the risk of being a -  
24 just a nasty antagonist, here is a facility that has  
25 four large emergency diesel generators and these are

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1 tested. These are on their maintenance role.

2 The staff at the sites understands how  
3 important each one of these machines is. And if you  
4 say, you know what, we gave you credit before but  
5 we're not going to give you credit now because the  
6 rules changed, I, for one, would say, what are you  
7 guys smoking.

8 I have - we have on this site an enormous  
9 amount of capability to power, to cross power, to  
10 support each unit with the other unit's diesel engines  
11 - why would you discredit that which you have  
12 previously credited.

13 MR. MCCONNELL: I would say that for  
14 design basis events you're absolutely correct. But  
15 when you consider the potential beyond designed based  
16 events and large area concerns or site wide events,  
17 maybe the thought process is, you know, as part of  
18 looking back at the Fukushima event saying that  
19 there's a possibility even if you have something  
20 protected to the design that there is a potential that  
21 you could lose all of that.

22 MEMBER SKILLMAN: Well, until you can  
23 produce the threat that wipes out all of them I would  
24 say hey, I want to continue to be given credit for  
25 them.

1 MR. REED: Yes. I understand what you're  
2 saying. I think what I would like to see is that you  
3 have a regulatory structure in place that always has  
4 you go to the preferential source of power first while  
5 Working down. So I'll say power restored. Then  
6 onsite power.

7 If you're a multi-unit site, okay, if you  
8 can get a diesel I'd say you're two - you're blacked  
9 out but your sister unit is not blacked out and they  
10 got two diesels. I'd want that diesel.

11 MEMBER SKILLMAN: Go for it.

12 MR. REED: Yes. So I'd work down - I  
13 think that's the way the EOPs would work and you'd use  
14 the preferential source and then the last thing and  
15 it's where we're trying to get to - this is why it's  
16 so convoluted and tough to - tough to explain these  
17 things - if you assume the extreme event unfortunately  
18 all this stuff is gone, you know, and that's where you  
19 get the response not obtained and go to FLEX.

20 So there's one thing about compliance with  
21 a regulation and then what we'd actually want people  
22 to do at the facility and they're not necessarily  
23 lined up here.

24 MEMBER SKILLMAN: I think all I'm trying  
25 to communicate is there needs to be some common sense

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1 -

2 MR. REED: Absolutely.

3 MEMBER SKILLMAN: - woven into a very  
4 highly prescribed method of compliance - that you get  
5 some of these larger units that have four and maybe  
6 five diesels and maybe a combustion turbine -

7 MR. REED: And some six.

8 MEMBER SKILLMAN: And some six.

9 MR. REED: And two SBOs.

10 MEMBER SKILLMAN: Then there needs to be  
11 some recognition this owner has attempted to provide  
12 not just defense in depth but above and beyond defense  
13 in depth, and that needs to be credited.

14 MR. REED: I think that's another - it's  
15 another element in this. See what these guys are  
16 doing in the order and that - how do we -

17 MEMBER STETKAR: I think that the  
18 Susquehanna had an event where they had a common cause  
19 failure with all four of their AC generators. That  
20 was not a - that was not a seismic event.

21 It wasn't a flooding event. It was loss  
22 of offsite power and I don't even know if they had -  
23 I think they did have loss of offsite power. But they  
24 did have a common cause failure of all four of their  
25 diesel generators.

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1           So in some cases, you know, we're talking  
2 about beyond design basis events. It was not  
3 presumed. You know, the design basis forces you to  
4 assume that one fails.

5           It also forces you to assume that  
6 everything else does not fail, and we have had  
7 experience where multiple diesels have failed due to  
8 common cause failures that, you know, in some sense  
9 benign are not driven by extreme environmental effects  
10 or things like that.

11           So and this - you know, the alternating AC  
12 power source if provided that it's sufficiently  
13 diverse - not redundant but diverse - protects you  
14 against some of that.

15           It doesn't - just having four diesels at  
16 a two-unit site that are otherwise identical doesn't  
17 protect you against those types of things either.

18           And we've seen those. I mean, that's -  
19 you know, it's a countable event. It happened once in  
20 my lifetime and it's happened, you know, in other  
21 places.

22           So just because I've got a lot of stuff  
23 doesn't necessarily mean that I'm guaranteed to be  
24 protected against it.

25           MR. REED: Either humans or parts or

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1 whatever, yes.

2 MEMBER STETKAR: Humans or parts and I  
3 don't even remember what the cause was there - the  
4 real cause. Was it fuel?

5 CHAIRMAN SHACK: Tim, from what you're  
6 saying you're back to the industry position where  
7 you're going to have 50.63. You know, when I first  
8 read your review graphs I had the feeling that 50.63  
9 was going away.

10 MR. REED: If you asked me back when we  
11 were going to do this on October 31st I might - I  
12 might have almost said that. We're changing in real  
13 time here. Now I don't think we could possibly do  
14 that.

15 MR. MCCONNELL: And a lot of that has to  
16 do with us not being able to craft some sort of  
17 language to motivate licensees to maintain an  
18 alternating AC source, given what the verbiage of the  
19 orders are.

20 MR. REED: I would probably - if I wasn't  
21 quote, the lead 50.63 I would actually put in  
22 something that says and you will not take out your  
23 alternating AC. I mean, that's terrible regulation,  
24 frankly. Doesn't look very nice. But you know what  
25 I'm saying?

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1 CHAIRMAN SHACK: Okay. So your thinking  
2 has changed, I mean, from those few graphs that I'm  
3 sitting at here look here from -

4 MR. REED: Yes. It's still changing, yes.  
5 It's changing right here.

6 MR. MCCONNELL: The one thing to keep in  
7 mind too is the fact, you know, that the existing  
8 50.63 rule was considered a dead rule where licensees  
9 are not required to go back and reanalyze or  
10 recalculate their coping durations.

11 So having it there at least we have some  
12 baseline that was - that was calculated at a baseline  
13 methodology back in the 80s and to establish at least  
14 some duration that which these plants are required to  
15 cope for certain type of events and then have the  
16 mitigating strategies which provide an additional tool  
17 set that licensees can use going forward or if it's  
18 outside the scope of 10 CFR 50.63.

19 MR. REED: Which gets right to the bottom,  
20 my last bullet here. I think what dawned on -

21 MEMBER SCHULTZ: Before you go there, Tim,  
22 just, again, on definition and communication, when we  
23 saw on slide 9 coping time and you indicated that from  
24 a licensing basis that was - that was the expectation  
25 or the definition and that might go away in some form,

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1 what we're hearing here is that that's not going to be  
2 the case - that -

3 MR. REED: Yes. Right now I'll call it  
4 the specified duration and determine -

5 MEMBER SCHULTZ: - and therefore just, you  
6 know, the word selection and communication associated  
7 with what we're talking about on Page 9 and this page  
8 is going to be critical for communicating all of the  
9 different pieces that will be in place.

10 MR. REED: I hear you. I probably should  
11 say the Reg. Guide 1.155 specified duration for 50.63  
12 will remain because I'm leaving that structure in  
13 place.

14 MEMBER SCHULTZ: Right.

15 MR. REED: And I'll probably be trumped by  
16 - trumped by this phase one time - a real-time  
17 situation and what it takes to really deploy  
18 equipment.

19 That might be the new thing that's,  
20 frankly, much, much longer and that really kind of  
21 steps all over it. But until we get that feedback and  
22 know what the circumstance is from the order, I don't  
23 know where we're at and we may be in a place where I  
24 keep saying if everybody's at 16-plus hours and we  
25 have no problems with the actions they're taking and

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1 it seems pretty good, we're going to say you guys are  
2 all 16-plus hour clients now.

3 If you've got this condition you can sit  
4 there for at least 16 hours and that's a good thing.  
5 We don't know that now and that's what I'm getting to  
6 in this.

7 MEMBER SCHULTZ: Okay.

8 MR. REED: And it's real hard to do this  
9 rule making without that feedback so -

10 MEMBER SCHULTZ: Understood.

11 MR. MCCONNELL: It's interesting to note  
12 too that 16 hours, you know, obviously that's the max  
13 end of the SBO rule for a coping specified duration.  
14 But, you know, we have - went back, the staff has, and  
15 reviewed some of the plants and looked at what their  
16 coping analysis and I said previously that they're not  
17 required to go back and redo analysis to determine if  
18 their - if they did it today what the specified  
19 duration would be.

20 But we know for a fact that there are  
21 several plants that would be bumped from a four-hour  
22 plant to a 16-hour plant.

23 But the problem is there's no requirement  
24 right now to force them to do that. I think the only  
25 plant that recently did that and actually came in

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1 under a license amendment and changed that was Palo  
2 Verde.

3 They went from a four-hour plant to a 16-  
4 hour plant. You know, they rely on it differently.  
5 They use a combination of batteries and diesel  
6 generators so they don't have an alternating AC by the  
7 definition but that's how they achieve 16 hours.

8 So that might be something that comes out  
9 of this if we get the feedback and everybody says  
10 that, you know, they need to survive 16 hours. Then  
11 maybe a number might be a appropriate to put in the -  
12 in the new rule.

13 CHAIRMAN SHACK: Dennis, are you online?

14 MEMBER CORRADINI: He can't talk.

15 CHAIRMAN SHACK: Well, he's supposed to be  
16 able to talk now but apparently he can't. Dennis, can  
17 you - can you say something?

18 MEMBER BLEY: Hello?

19 CHAIRMAN SHACK: Yes, now we can hear you.

20 MEMBER BLEY: Oh, okay. I tried earlier  
21 and I couldn't get in.

22 CHAIRMAN SHACK: We let you in. Are you  
23 going to say more than that?

24 MEMBER BLEY: I apologize. Murphy had  
25 just called me the second before you did that and I

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1 didn't hear the question -

2 CHAIRMAN SHACK: I was wondering whether  
3 you had a question.

4 MEMBER BLEY: Over the day I had a couple  
5 things that went - were very early on in this  
6 discussion about the FLEX approach and there was  
7 discussion about our having overconfidence in FLEX.

8 And from one point of view I think that's,  
9 you know, it's a comment I agree with for any  
10 identifiable specific scenario can certainly be  
11 better than FLEX as far as the reliability and  
12 effectiveness.

13 For the things that aren't identified  
14 either by PRA or -

15 MEMBER STETKAR: Dennis?

16 MEMBER BLEY: - you're going to lose -

17 MEMBER STETKAR: Dennis? Dennis? You're  
18 breaking up so I don't know what phone you're on but  
19 we're getting about maybe two-thirds of what you say.

20 MEMBER BLEY: Let me try one other thing  
21 and then I'll give up.

22 MEMBER STETKAR: You sound better at the  
23 moment.

24 MEMBER BLEY: Is that better?

25 CHAIRMAN SHACK: Well, keep - put together

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1 three consecutive sentences.

2 MEMBER BLEY: Okay.

3 CHAIRMAN SHACK: I didn't say coherent.

4 I said consecutive.

5 MEMBER BLEY: The scenarios that haven't  
6 been identified either by PRA or by the real world,  
7 you know, FLEX offers advantages. It's certainly not  
8 anywhere near close to the optimal solution.

9 There was a discussion about the  
10 difficulty of designing FLEX. Maybe 25, 30 years ago  
11 there was a precursor to the whole idea, developed and  
12 the folks who were involved with it developed the  
13 ability to take cables directly to the - to the pump  
14 connection box and hook them up there was pretty  
15 interesting - little connectors commercially  
16 available.

17 So I think it was around that although I'm  
18 not sure they really delved into this area as yet. So  
19 that was the only thing I wanted to put in that I -  
20 the thought. I quit.

21 CHAIRMAN SHACK: Okay. And you're still  
22 breaking up a bit so I'm not -

23 MEMBER STETKAR: Yes. It's not an optimal  
24 solution.

25 MEMBER BLEY: Yes. Okay.

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1                   MEMBER STETKAR: You may - you may want to  
2 try calling back.

3                   MEMBER BLEY: That's the noise - it's the  
4 best I can do.

5                   CHAIRMAN SHACK: Okay. Or call in on a  
6 different phone.

7                   MEMBER BLEY: I can try that.

8                   CHAIRMAN SHACK: Go to a Western Electric  
9 land line if one's available.

10                  MEMBER BLEY: I'll try.

11                  MR. REED: Okay. Then that's - why don't  
12 we move then to slide 12? I think this brings us -  
13 and we actually touched upon this stuff already - not  
14 too surprising, given the interaction here.

15                  But so we'd like - we believe there needs  
16 to be a little bit more flexibility in the rule making  
17 that would be - in the order. I think that'll allow  
18 more engineered approaches and we give an example here  
19 - in fact it was already mentioned a little bit about  
20 a robust alternating AC source that if I was to do  
21 something to allow something like this would be, first  
22 of all, independent, diverse and separate from the  
23 emergency, the 1E diesel generators, and physically  
24 move away from them maybe with the least multiple ways  
25 of providing that electricity to all the 4160 buses.

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1           Of course, that would have to be through  
2 a manual action but, in other words, give you a lot of  
3 flexibility with this thing and then it would be  
4 designed, of course, and then probably in some sort of  
5 structure that would be robust for external events.

6           And I have an idea there. You see that  
7 there would be at least, of course, your GDC2  
8 protection but it would be, like I said, greater than  
9 or equal to your available physical margin and the  
10 idea there would be to see how this hit you, would be  
11 - that that should be the strongest link in the chain  
12 and so if you had a severe event that this thing would  
13 withstand it and it makes no sense to make it  
14 extremely robust when the distribution system that  
15 it's providing power to and everything else gets  
16 destroyed.

17           So but I do want this thing to be kind of  
18 the last man standing, if you will, and that that's  
19 what I would call a robust alternating AC source and  
20 it would be great enhancement, of course, for  
21 blackout.

22           It would be good for a lot of these  
23 sequences too and it's a good thing for that phase  
24 one, that initial capacity when we're getting to some  
25 crazy battery situations here - you know, we could

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1 get. So, anyway, that's that idea so -

2 MEMBER STETKAR: Tim, that third sub  
3 bullet there that says multiple and separate supply  
4 paths to all emergency AC buses, I think, is important  
5 in this concept so that we don't fall into the  
6 deterministic type of fire protection. Well, I will  
7 protect, you know, train A -

8 MR. REED: Yes.

9 MEMBER STETKAR: - with the presumption  
10 that train A shall never fail due to any other - any  
11 other cause. So I think that that - that that need to  
12 provide the capability to connect to any or - any not  
13 all but -

14 MR. REED: Yes, any of -

15 MEMBER STETKAR: - but any one of the  
16 divisions is very important.

17 MR. REED: That's right. And it would be  
18 a function of your hazards, you know, as to what that  
19 would mean. You know, if you've got hazards - certain  
20 hazards you might want underground, one above ground,  
21 whatever, separate, you know -

22 MEMBER STETKAR: This is all operating  
23 mode so there's some chance it happens during an  
24 outage when your division A is, you know, disassembled  
25 for planned maintenance and all you have is division

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1 B or something like that.

2 You know, so it's - I think that's  
3 important because otherwise you get the gamesmanship  
4 of we will have train A and only train A as our  
5 protected designated beyond design-basis event train  
6 or something.

7 MR. REED: I mean, that's a robust  
8 alternating AC source. Now, that's a - I think it's  
9 a good idea but unfortunately I've got - the reality,  
10 of course, is I have licensees out there right now  
11 implementing the order and this is not, you know,  
12 flexibility in the order and spending about \$20  
13 million per plant, you know, a dual site, \$40 million  
14 plus doing strategies order, and so this is really  
15 hard now. What incentive can I give a licensee when  
16 they're already spending that kind of money?

17 They're not going to want to go and build  
18 what would be a pretty expensive thing, you know, put  
19 in place something like this and so I think this is  
20 most likely - more for a new design situation that  
21 would be useful.

22 Another - an idea I'll throw out here to,  
23 you know, you all consider is if you were - I'm trying  
24 to find a way to give these guys incentives to do this  
25 and if I were to allow somebody to do what I'll call

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1 a short and sweet version of 2.1 - I'll call it the  
2 hardened core version of 2.1.

3 In other words, they'll do - reset the  
4 seismic design basis for every system structure  
5 across the facility, reset it for the things that  
6 actually directly pertain to these functions only, you  
7 know, core cooling, spent fuel cooling and  
8 containment, okay, and then allow this thing to be the  
9 power supply as your - in other words, this is the  
10 benefit.

11 Again, I'll let you do this and this is  
12 how you - this is your advantage. I'll get you out of  
13 the rest of that 2.1 which could be very expensive.

14 I'm trying to find ways of giving an  
15 incentive because I really think this thing has a lot  
16 of enhancements and safety for all the - for a  
17 blackout in other areas.

18 And so it gets you, I think, more safety  
19 than you would lose otherwise. You know what I'm  
20 saying? I don't know if that makes sense. There's,  
21 you know, I think you could only do -

22 CHAIRMAN SHACK: You don't know what  
23 you're going to do with 2.1 yet -

24 MR. REED: Right.

25 CHAIRMAN SHACK: - is one of the -

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1 MR. REED: Yes. I mean, that's part of  
2 the challenge. Two point one, I think there was some  
3 discussion about doing something. I haven't heard if  
4 that's still going on with seismic and try to do a  
5 more quicker, faster -

6 CHAIRMAN SHACK: Yes. I mean, there are  
7 many things going on here.

8 MR. REED: There are, and I've heard some  
9 of that myself and I think there's another meeting  
10 coming up on it. I haven't heard that for flooding or  
11 anything but I've heard it for seismic. But -

12 MR. CHEOK: And the schedule for 2.1 is a  
13 little bit more for the fact that then it would be for  
14 this one also.

15 MR. REED: So realistically I think this  
16 is probably something more for new designers and I  
17 think it's a good thing. We wouldn't want to have any  
18 place where this thing would be susceptible, like a  
19 common mode issue or a single plate failure kind of  
20 thing.

21 So this would be - that would also be  
22 built into this thing and we probably - like we said  
23 before, we'd really only be giving credit for the  
24 phase one. Maybe a little bit more. I don't know.  
25 We'll have to see.

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1           But no matter what, you have phase three  
2 for sure, you know, because, you know, even if you had  
3 this thing this thing would run out. If we need to  
4 replenish the fuel, what have you, you have that no  
5 matter what and I think you need to have some FLEX to  
6 some level also no matter what, you know.

7           So, again, this is a concept right now.  
8 We're trying to figure out how to build it in. We  
9 have some design criteria right now, a draft rule that  
10 would perhaps allow this kind of thing to be pursued.  
11 We may see some alternatives under the order.

12           Again, this one's really a strong function  
13 feedback on the order to what we could be, you know,  
14 accept and allow come into the rule making. So that's  
15 one idea and that's a robust alternating AC idea that  
16 I throw out there.

17           Another one, and I mentioned this before,  
18 this is - this is what I call the really good decay  
19 heat removal pump thing and this is, I think, a  
20 really, really good - I love this idea because some of  
21 these old guys - this is an old two loop plant, Ginna.

22           They're designed pre-GDC - 71 GDCs.  
23 They're probably somewhere in the draft 67 GDCs and  
24 they're an SEP plant and I was somewhat familiar with  
25 this facility. I was a consultant, but these guys

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1 have a lot of issues and this is a really good idea to  
2 have like a seismic category one source of water for  
3 24 hours -

4 MEMBER STETKAR: As long as they don't  
5 have reactor coolant pump seal LOCA or while they're  
6 hooking the thing up you don't get up to a pressure  
7 that opens a PRV and it sticks open.

8 MR. REED: That's right.

9 MEMBER STETKAR: This just makes a lot of  
10 sense for the specific set of events that they thought  
11 about for this thing.

12 MR. REED: Right. You still -

13 MEMBER STETKAR: It doesn't make sense for  
14 a lot of other things.

15 MR. REED: It doesn't get to the RCS  
16 issue. Absolutely. If we did here - for example, an  
17 idea on that too from Oconee, trying to use the safe  
18 shut down facility which, by the way, does both sides  
19 of it but there's all these - there's issues with that  
20 too, you know, but -

21 MEMBER STETKAR: Plants in Europe have  
22 installed bunkered - single train bunkered systems  
23 that have an injection pump, a cooling water pump and  
24 an auxiliary feedwater pump.

25 MR. REED: Okay.

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1 MEMBER STETKAR: And a diesel generator,  
2 you know, so they solve all of those functions, and  
3 they're not cheap.

4 MR. REED: Yes. And in some there's both  
5 the primary side and the secondary side so it's  
6 running both.

7 MEMBER STETKAR: Yes. I mean, they have  
8 an injection pump. They have a -

9 MR. REED: That's the ideal -

10 MEMBER STETKAR: - you know, a - if the  
11 stuff needs cooling water they can provide makeup.  
12 They can't survive, you know, a large load because  
13 they're not for - they didn't provide seal LOCA type  
14 things. They have cooling water for seals.

15 MR. REED: Now, what I'd love to  
16 understand is that - of course, that's drawing the  
17 line in the sand somewhere else now because that's -

18 MEMBER STETKAR: But that's - as I said,  
19 it's more expensive than that second bullet.

20 MR. REED: And if the event exceeds that  
21 design, of course, that's gone too. You know, me, I  
22 think of it as the Maginot Line. You want to move it  
23 to another place I'd say it's two times your SSE or 15  
24 feet higher and your - for a flood - whatever it is.

25 You know, what I'm saying you put that in

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1 place it's really good. I think it's going to get  
2 more - obviously it's going to get more stuff. It's  
3 an enhancement. But the event - remember, this is  
4 unbounded again. They've had an excuse and that's  
5 gone too.

6 So that's why we keep coming back to say  
7 probably need a FLEX option in there - a diverse FLEX  
8 thing. So those are two ideas that, you know, I just  
9 want to put out so you can see the - some of the  
10 things we're considering and there's more ongoing  
11 right now as we try to - we're trying to find ways -  
12 this gets to my last stuff - I'm trying to get  
13 feedback any way we can with the licensees because  
14 we're on, as Mike began the conversation, on a very  
15 expedited schedule and one that it really - it kind of  
16 makes it virtually impossible for us to do a  
17 meaningful feedback and lessons learned from the order  
18 and fold that into the proposed rule.

19 And as you see there, the order  
20 implementation and as I mentioned, again, remember the  
21 order and the rule are virtually overlapping here, the  
22 order implementation is really pegged to the guidance  
23 which is issued at the very end of August of this  
24 year.

25 It was - and the plans are to me - the

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1 implementation plans are to come in on February 28th  
2 of 2013 was to have the two refueling outages or - and  
3 no terms later than the end of 12/31/2016. So that's  
4 the order of implementation.

5 We are right now - we were pushed by that  
6 SRM. Again, I think that's a mind set from the  
7 Commission that didn't know what we were going to do  
8 five months later.

9 But that SRM was directing us to provide  
10 them a proposed rule in April of next year and a final  
11 rule in April of the following year, a full year and  
12 eight months before the end of the order  
13 implementation. So that makes this a very challenging  
14 issue.

15 So currently, you know, my druthers would  
16 be, of course, to have that - have this rule making  
17 displaced in time to allow us to get first level of  
18 feedback from this order and the lessons learned from  
19 that, to fold that into the rule making, really mostly  
20 in the section by section in terms of the meaning and  
21 intent of the language as well as into the guidance,  
22 have that fold in. Maybe move us back to line us up  
23 with recommendation 8, okay, so that we can fold in  
24 the treatment of this FLEX - work out alliance with  
25 that.

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1           It would also, of course, give more time  
2           for this committee to inform the process. But as of  
3           right now, that's not the schedule we're on. So I  
4           just want to let you know that that's the situation.

5           Right now we are planning to bring this  
6           back to the ACRS. We have the specific dates there,  
7           in fact, at the end there - March 5th to the  
8           subcommittee, 2013, and April to the full committee.  
9           That's our current schedule we're on.

10          So that's my plea for - my scheduling plea  
11          or whine or however you want to look at it and, of  
12          course, the committee - if you want to comment to  
13          somebody or help me in that regard that's certainly  
14          appreciated, any feedback in that regard as others -  
15          the schedule should be revised it'd be greatly  
16          appreciated.

17          So that's really the next steps though.  
18          That's what I talk about there and a challenging  
19          schedule. So that's all I have in terms of my  
20          presentation and appreciate it -

21                 CHAIRMAN SHACK: Are you formally asking  
22                 the Commission to change the schedule?

23                 MR. REED: Not at this point in time, no,  
24                 I'm not.

25                 MR. CHEOK: I think that the stakeholders

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1 would like to see rule making and action sooner rather  
2 than later. So that's what's driving the schedule.

3 MEMBER CORRADINI: What's driving the  
4 schedule?

5 MR. CHEOK: We have stakeholders. You  
6 know, they would like to see us, the agency, act on  
7 some rule making, especially in the station blackout  
8 area, sooner rather than later and that, you know,  
9 five years beyond the Fukushima event would be a  
10 guideline - would be a good schedule to make.

11 MR. REED: And, of course, my personal  
12 response to that is is that we are actually way ahead  
13 of schedule. The rule was put into the order March  
14 12th of 2012. Those are the requirements. You can't  
15 go more than that. They're already placed.

16 Now, you can argue that implementation, of  
17 course, is taking some time.

18 MEMBER CORRADINI: I don't know that  
19 you're anticipating what I'm about to say but I'm  
20 still of the opinion of what's the rush on a whole  
21 bunch of this. But that's my position.

22 MR. REED: Well, okay. You're -

23 MEMBER CORRADINI: I'm the other side.

24 MR. REED: You are. So I think it's a  
25 communication problem myself, you know, because I

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1 think as far as stakeholders some, as Mike mentioned,  
2 I think they think we only do things in rule making.

3 Well, the Commission does things in orders  
4 and rule making among other but when we impose  
5 requirements they're by those two vehicles principally  
6 and in this case this order was the rule. It was a  
7 performance-based version of all of NTTF 4, now, and  
8 in theory, in my view implemented at maximal speed in  
9 terms of we developed the guidance as fast as we could  
10 up to August.

11 We're giving these guys two refueling  
12 outages. You know, when you think about it they got  
13 to go in and take a look at things, see what they need  
14 in the first refueling outage. The second outage  
15 you're going to be doing some substantial changes.

16 They've purchased a lot of equipment.  
17 They are actually working it down now to a detailed  
18 level and you'll find it in those plans next February.

19 So a lot is happening and it's - this is  
20 very real. It's apparently going on and those would  
21 be, I think, what - basically the same requirements as  
22 would be in the rule making.

23 My rule making would only be different, in  
24 my view, if I had to take a guess in terms of offering  
25 more flexibility than what was - and reflecting what

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1 we optimally accepted in the order.

2 As of right now it's going to - if I'm on  
3 the current schedule as a practical matter it's going  
4 to look like the order virtually identical, really,  
5 for all intents and purposes.

6 So that - so yes, to answer directly  
7 though we haven't explicitly gone to the Commission to  
8 do that. I just want to make sure this committee is  
9 aware of that and this committee is free to inform  
10 whoever they want to.

11 MR. CHEOK: In addition to what Tim had  
12 said, what we heard from this subcommittee today was  
13 that we could probably better risk inform this  
14 regulation and, you know, doing - and that would  
15 actually be a argument as to why we should take more  
16 time to think about this.

17 MR. REED: Yes. I'm a big fan of, you  
18 know, risk informing with you guys all working the  
19 50.63 yourself. But yes, right now that's - that's a  
20 luxury we can't even, you know, address.

21 MEMBER SKILLMAN: Tim, let me ask you  
22 this. You've got the Ginna folks saying here's our  
23 dedicated system.

24 MR. REED: They - I shouldn't commit them.  
25 They were actually talking about it, just, you know -

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1                   MEMBER SKILLMAN: Okay. But just in  
2 theory say they said this is what we want to do.  
3 We've got the SSF at Oconee. It's my understanding  
4 that they're beginning to move, saying, you know, we  
5 can use this for this application.

6                   MR. REED: They've talked to us also.

7                   MEMBER SKILLMAN: Are there other sites -  
8 there's two of the 68 sites - are there other sites  
9 that are coming up with a clever solution like this?

10                  MR. BOWMAN: We're scheduled to talk to  
11 Prairie Island tomorrow. I haven't got any details on  
12 what they're going to propose and I think that's about  
13 it.

14                  MEMBER SKILLMAN: Okay. But these  
15 solutions seem to be almost independent from FLEX.  
16 They're coming up with another way to do this with the  
17 intention of protecting the core, protecting the  
18 containment, protecting the spent fuel pool.

19                  MR. BOWMAN: The difference - the Ginna  
20 approach as they discussed it with us the difference  
21 is that they'd be using an installed generator which  
22 the terms of the order wouldn't allow. If they use  
23 the portable generator doing the same thing it would.

24                                So that's the kind of thing that could  
25 inform the rule. But we would have to figure out how

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1 do we address it in the - in the order space.

2 Is it necessary to relax it or is it  
3 necessary to consider it as an alternative approach to  
4 the guidance that was endorsed?

5 MEMBER SKILLMAN: Okay. Thank you. Thank  
6 you.

7 MEMBER STETKAR: I really think a part of  
8 - you talk about risk informing this or you talk  
9 about, you know, Ginna's proposed option, you just  
10 really need to be careful about how do you - how does  
11 a licensee provide assurance that they can feasibly  
12 mitigate the spectrum of conditions that can happen  
13 during these beyond design basis scenarios?

14 For example, Ginna says, well - I don't  
15 what their thought process but it sounds like well,  
16 they didn't assume a simultaneous LOCA. So otherwise  
17 aux feedwater does well for transients doesn't so well  
18 for LOCAs.

19 I'm not sure what presumptions have been  
20 built into the FLEX strategies regarding the types of  
21 scenarios that they're designed to mitigate or protect  
22 against.

23 And so just saying well, you know, FLEX is  
24 being implemented according to the order I think we  
25 need to be careful to think about what the spectrum of

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1 those scenarios might be, as we discussed earlier,  
2 within the range of somewhere between a de minimis  
3 acceptable risk and, you know, what we're saying is a  
4 benign thing.

5 So I'd just - as you go forward, just keep  
6 that in the back of your mind. I mean, if it isn't a  
7 fully risk informed process just be aware of where  
8 those edges are.

9 MR. REED: Yes. The order - and Eric can  
10 correct me if I misstate - I'm sure you will - yes,  
11 the order is saying no AC power, okay, but DC power -  
12 you know, intact and therefore the vital distribution  
13 system intact and deliver.

14 So there's some - and we've got comments  
15 on why did you assume that - that wasn't there at  
16 Fukushima, you know, for example.

17 Of course, the guidance says if you don't  
18 have that you go right to the decay removal. So the  
19 guidance is built in to try to go to what makes sense.

20 They'll give you that probability again to  
21 be successful but yes, we have some strange  
22 assumptions and - or maybe seemingly strange or not  
23 logical or even coherent, whatever.

24 But I think they work fairly well in terms  
25 of what ended up being the equipment, the strategies

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1 and everything and how it flows. It's worked out  
2 fairly well. I think it is built pretty well.

3 CHAIRMAN SHACK: But still, until you do  
4 the full PRA you don't really know where you're at.

5 MR. REED: I don't know where you ended  
6 up, yes. Yes, I understand that and that would be  
7 nice to know.

8 If you - yes, if you ask me what I think  
9 we might have done I think we might have taken that  
10 ten to minus five and driven it into ten to minus six  
11 from SBO, you know, for example.

12 I think we did some - we did some - we're  
13 doing good things here. I don't know what it really  
14 means though for some of these other design basis  
15 external events, you know. That's where I'm really at  
16 a loss.

17 What are the probabilities of these  
18 things? What, you know, is there any - what for each  
19 facility and what do we do - how much do we get of  
20 that. That's going to be really - that would be  
21 tough.

22 That would be really, really informing as  
23 to what - how much we accomplish here.

24 CHAIRMAN SHACK: That makes sense.

25 MR. REED: Just - we really won't have

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1 that luxury at the speed we're going right now to do  
2 that.

3 So that's all I have. I mean, I guess we  
4 have another half an hour if you want to keep  
5 interacting on anything, going back to anything else.

6 CHAIRMAN SHACK: See if anybody would like  
7 to make comments. Is the bridge line open?

8 COURT REPORTER: The bridge line should be  
9 open.

10 CHAIRMAN SHACK: Is there anybody on the  
11 bridge line who would like to make a comment? Is  
12 there anybody on the bridge line that can hear me and  
13 can make a response?

14 MEMBER STETKAR: Easier to just say if  
15 you're out there please say something so we know it's  
16 open.

17 CONSULTANT FLACK: I have a question. I  
18 guess it's sort of a question. This is John Flack.  
19 Getting back to adequate protection and the use of  
20 nonsafety related equipment it gets to be that -  
21 somewhat a slippery slope.

22 I mean, where does that end? I know it  
23 was already done in one part of the regulation under  
24 50.55 but I mean, if you put it into this context I  
25 think you start ending up in a situation where where

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1 do you draw the line and I mean, how do you enforce it  
2 if you're saying you can use this equipment, nonsafety  
3 equipment, to provide adequate protection. I mean,  
4 does that present a problem here in this context of  
5 the rule making activity?

6 MR. REED: Yes, it's presented a - it's a  
7 problem for me and this goes back to my, you know, the  
8 old way of thinking.

9 You know, when I think of adequate  
10 protection it's really simple to think in terms of  
11 design basis, safety related, all that equipment, all  
12 the pedigree, you know, the whole analysis and  
13 everything. And when I apply that as words to this  
14 beyond design basis situation and I'm using this stuff  
15 without the pedigree, what the heck does that mean?

16 And I'll give you a real simple example.  
17 You know, one of the challenges we have is trying to  
18 figure out how to maintain the configuration and  
19 change control for this situation, all right, and in  
20 design - and within the design basis that's well done  
21 by 50.59. It means - that means that's developed  
22 exactly for that.

23 When they go outside of that, 50.59  
24 doesn't see it, doesn't even know it's there. It  
25 means it's blind to it and what is success anymore and

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1 how you judge changes and how can this be adequate  
2 protection if I don't know what success is.

3 I understand it exactly. So that's why I  
4 went back to the beginning and said I think we're  
5 going to call success being this - the mitigating  
6 strategies, the core of equipment and everything that  
7 we accept under this thing and maybe more flexibility  
8 and that's what success is - success is and I think  
9 another way I've thought about it is is that this is  
10 almost like a set of stuff, if you will, that  
11 addresses uncertainties, okay, and it's more defense  
12 in depth.

13 You can almost take it like a - another  
14 containment, for example. I'm simply - the Commission  
15 say I have uncertainty. I'm putting the stuff in.  
16 It's more defense in depth and it's adequate  
17 protection.

18 And so if you think of it in that bin,  
19 okay, but it's still - it's still challenging - it's  
20 still challenging when you get down into some of the  
21 nuts and bolts and you're looking to change control or  
22 whatever.

23 Somebody's trying to figure out where it  
24 goes. Should it be the FSAR, for example. When you  
25 work it down through it gets to be very challenging -

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1 in other words, what should be the treatment. That's  
2 why we talked about the augmented treatment.

3 I'm not treating it likes it's safety  
4 related or special treatment. I've been shaking and  
5 baking it, you know. That's why we're going to all  
6 those actuaries to try to figure out where the heck do  
7 we fit this thing and it was a challenge under  
8 50.54(hh)2 also.

9 MR. BOWMAN: Yes. The one thing that I  
10 would add to that is that a lot of the equipment  
11 that's being procured has its closest parallel in the  
12 fire protection equipment, which is not safety related  
13 per se.

14 It's got its own fire protection QA  
15 program that's an augmented sort of quality type of  
16 thing but it's not Appendix B.

17 MEMBER SIEBER: I think for the - this is  
18 really a legal question and perhaps our friend from  
19 the Office of General Counsel could comment.

20 MR. WEISMAN: This is Bob Weisman from OGC  
21 and I was going to chime in but Tim said pretty much  
22 what I was going to say. I think that the difference  
23 is that safety related items are designed - that it's  
24 within a design basis.

25 Once you step outside of the design basis

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1 that's a different world and - legally speaking. So  
2 we can set whatever requirements we want to set for  
3 being out - when you're outside the design basis.  
4 Doesn't have to be safety related.

5 That doesn't necessarily have an  
6 implication for the safety related equipment that's  
7 relied upon in the design basis. Okay, and that is  
8 the distinction.

9 MEMBER SIEBER: Is there freedom to step  
10 any place outside the design basis that you -

11 MR. WEISMAN: Well, we have - the staff  
12 has -

13 MEMBER SIEBER: - perceive the need that  
14 you want to be there?

15 MR. WEISMAN: The staff has to justify it  
16 why it's - why - either why it's adequate protection  
17 or why it's cost justified. But those are - those are  
18 - that's what establishes the limits I think.

19 MR. REED: And I think there have to be  
20 a safety or it becomes defense and security -

21 MEMBER SIEBER: It sounds - it sounds like  
22 you need a risk analysis and an economic study for -

23 MR. REED: We'll have reg analysis that'll  
24 support the rule. But I'm not sure that's what you're  
25 talking about. I will - I will say one thing in

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1 regard - it just jumped in my head now and this is  
2 also important.

3 You know, when you - we have this - put  
4 this stuff in place one thing we do have to be  
5 concerned about is adverse interactions, you know,  
6 with this putting in portable equipment, adverse  
7 interactions it might have with safety related  
8 equipment.

9 MEMBER SIEBER: Absolutely.

10 MR. WEISMAN: And we have many provisions.  
11 I mean, we're addressing that.

12 MR. REED: Yes, we're worried about that.  
13 I'm talking about process, physical, electrical,  
14 whatever. And you don't want to have that happen for  
15 sure. But in general it's - we're in this other Alice  
16 in Wonderland world and it's very tough to deal with  
17 it.

18 MEMBER SIEBER: Yes. And the structure is  
19 not there, the legal underpinnings, as they are for  
20 issues within the design basis.

21 CHAIRMAN SHACK: Dennis, are you still on  
22 the line and want to make a comment? You just sent me  
23 an email saying you did.

24 (Laughter.)

25 MEMBER RAY: While we're all waiting for

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1 Dennis if the OGC could comment on - the issue of not  
2 having to be safety related that's, I think, pretty  
3 simple. But what about the problem of change  
4 management, change controls?

5 You present one thing today and that's  
6 deemed to be acceptable but it can't last forever and  
7 it's got to be replaced someday with something else  
8 different.

9 What do you look to to say well, I'm still  
10 within the - I don't know what do you call it -  
11 licensing basis or what you call it. I haven't  
12 deviated from what I said ten years ago that much.

13 MR. WEISMAN: That's certainly an issue  
14 and we are drafting change control processes with  
15 respect to the equipment and with respect to the  
16 strategies themselves.

17 So how you're going to measure that, there  
18 are a lot of - there are several different ideas  
19 floating around.

20 MEMBER RAY: Okay. That's fine as long as  
21 it's on your radar screen.

22 MR. WEISMAN: Yes. We're thinking about  
23 it and we have some proposed ways of dealing with it.

24 CHAIRMAN SHACK: Dennis, can you - can you  
25 speak now?

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1 MEMBER BLEY: I can - I can speak. Can  
2 you hear?

3 CHAIRMAN SHACK: We can hear.

4 MEMBER BLEY: Hey, it's a miracle. Is  
5 that any better than before?

6 CHAIRMAN SHACK: Yes. Get three sentences  
7 out.

8 MEMBER BLEY: I won't go over the other  
9 stuff but I had two things that came up since then.  
10 Back in that early discussion about the battery  
11 testing that might be going on up at Brookhaven with  
12 old batteries, there are a few things bothering me  
13 about that and they have to do with plant-specific  
14 batteries.

15 I mean, whatever ones we get to test will  
16 have their own history. The ones in a particular  
17 power plant will be different, and from a couple of  
18 experiences in the past when working with the  
19 electrical folks at a plant they did some of their own  
20 testing.

21 The guys I had worked with found that -  
22 they don't know all the loads on the batteries.  
23 Despite whatever records they have of what should be  
24 running there were more loads than they expected. So  
25 that when they really monitored things weren't as in

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1 the plans.

2 So if you don't look at details and do  
3 some testing at the plants I'm not sure what we'll  
4 gain from the battery testing.

5 The other thing that came to me in one of  
6 the latter discussions about things other people are  
7 doing or have done, I wonder if you guys on the staff  
8 have talked with the Dutch at all.

9 Because of their potential for flooding  
10 they've done some very innovative protective measures.  
11 On the one plant I worked on they had put risers in  
12 for electric power and for water at multiple places  
13 around the plant so they could float up a barge.

14 We could drive up a truck maybe in some of  
15 ours, and hook up there and then inside the plant both  
16 in containment and the equivalent of the aux building  
17 they were able to make internal hookups to use the  
18 supply.

19 So it might be worth seeing what they were  
20 up to and see how that meshes with what's going on in  
21 the FLEX approach. Those were the only things I  
22 wanted to toss on the table.

23 MEMBER SIEBER: The Borssele plant in  
24 Zeeland, Netherlands.

25 MR. BOWMAN: Okay. This is Eric Bowman.

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1 Thanks for that, Dennis.

2 I have not seen what the Dutch approach is  
3 but I have had discussions with some plants in the  
4 U.S. and some licensees are considering putting the  
5 external connections for the FLEX equipment at various  
6 different elevations that would be accessible based on  
7 their site-specific considerations.

8 I haven't had anyone actually say they  
9 were planning on floating a boat over to hook  
10 something up.

11 But they have discussed putting the  
12 connections so they'd be accessible from adjacent  
13 rooftops and things like that.

14 MEMBER BLEY: Okay. Well, I think what  
15 they had done was interesting. I had seen the Dodewar  
16 plant, which is now shut down. But they had some  
17 pretty interesting capability.

18 MR. MCCONNELL: This is Matt McConnell.  
19 I just wanted to address your questions on the  
20 batteries or comments on the batteries. I don't know  
21 if I misspoke earlier but the batteries that  
22 Brookhaven is testing are relatively new batteries.

23 They were procured about three years ago,  
24 I believe, and they are very similar - actually the  
25 same models that are being used in the industry.

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1           So there are three battery vendors that  
2 are currently - have nuclear qualified products and  
3 it's the C&D Technologies, GNB, who's qualified  
4 through Nuclear Logistics, and the last one is  
5 Enersys.

6           So the models that we're actually testing  
7 or Brookhaven is testing are very similar - maybe  
8 slightly different in capacities but they're generally  
9 representative to what's being used in the industry  
10 and they were procured the same way.

11           So, you know, with the exception that  
12 we're not testing full banks of battery we are doing -  
13 I think they're scaled down testing. I think they  
14 have around 12 cells per battery.

15           But the actual duty cycles are being  
16 modeled and represented accordingly. With regard to  
17 your question on the loading that might not be  
18 accurate, I can't speak to that except for the  
19 licensees are required to ensure that they are able to  
20 meet their demands.

21           MEMBER BLEY: Thank you. I appreciate the  
22 first half, which means they'll be more relevant. But  
23 I also think that other - maybe it's worth considering  
24 some in-plant testing to make sure because it was  
25 surprising both places where I'd seen it done.

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1 MR. MCCONNELL: Well, and I appreciate and  
2 understand your comment. One of the other, I guess,  
3 deficiencies or weaknesses that you want to call with  
4 the existing 50.63 rule was that we did not specify  
5 any testing guidance for the Class 1E batteries that  
6 are being credited for station blackouts.

7 So and based on my working with industry  
8 I'd say less than half of the industry actually tested  
9 their station blackout profiles, which may be in  
10 certain circumstances more severe than their actual  
11 loop LOCA design loads because you really only need  
12 them for a few seconds actually when you - in that  
13 situation.

14 So I think one of the - one of the other  
15 things I'm keeping in my back pocket going forward is  
16 whatever the utilities are going to credit in the  
17 mitigating strategies specifically with new coping  
18 times that there are testing requirements attached to  
19 it.

20 MEMBER BLEY: Thank you.

21 CHAIRMAN SHACK: Are there any further  
22 comments from any of the other members?

23 MEMBER SCHULTZ: Well, I just want to make  
24 a clarification on the initiatives that you described  
25 with Ginna and Oconee as examples, and the

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1 possibilities that others are coming forward.

2 It sounded as if you're still looking for  
3 ways in which to accept such initiatives and work them  
4 into the process. But given the way things are today,  
5 that has not been formulated as to how to work that  
6 into the program for an individual licensee or -

7 MR. BOWMAN: For the FLEX order we have,  
8 of course, endorsed by means of the interim staff  
9 guidance the NEI document 12-06 and we've invited  
10 licensees if they have a better idea to use an  
11 alternative approach that doesn't conform precisely to  
12 that guidance to come in and tell us what they want to  
13 do now because we are on a very short time line to go  
14 through and evaluate the innovative plans we get and  
15 give them feedback if those plans are indeed  
16 acceptable and that they will be considered to be in  
17 compliance with the order based on what they've  
18 submitted to us and based on the modifications they  
19 make after that second refueling outage when the full  
20 compliance is required.

21 MEMBER SCHULTZ: And are they making the  
22 justification argument in comparison to FLEX or are -  
23 in terms of developing your acceptance criteria?

24 MR. BOWMAN: We have been seeing really  
25 bare bones sketches because nobody has gotten to the

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1 point of having a full-blown integrated plan yet as to  
2 what they're going to do.

3 We are looking to criteria similar to what  
4 we have in place for the crediting of existing design  
5 features for new reactor designs for the 50.54(hh)2  
6 material.

7 It's in Section 4.2.3.4 of NEI 0612  
8 Division 3, which is the guidance for the compliance  
9 with the prior set of mitigating strategies. It's not  
10 a perfect fit for the order.

11 We had sought input from industry and  
12 other stakeholders on what we should use for such  
13 criteria if we wanted to formally set it up. We  
14 haven't got formal criteria established right now.

15 I would be looking at things similar to  
16 that. I would - given a proposal like Ginna's to have  
17 a - and bearing in mind that it's not a proposal, it  
18 was just a discussion informally with them, to  
19 prohibit the use of an installed generator adjacent to  
20 a motor-driven pump but allow a portable generator  
21 doesn't make a lot of sense and it may be possible to  
22 equate the system as a diesel-powered pump using an  
23 electric motor driving force because it's separated  
24 from internal power distribution systems and you avoid  
25 exposing the systems - supporting systems as much as

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1 it would be in relying on the general power  
2 distribution system.

3 Ideas like that are the type of things  
4 that we'll take into consideration in coming to a  
5 conclusion on whether or not it's acceptable.

6 MR. REED: Right. I guess - so we've  
7 heard this, had some interactions, but we don't - it  
8 hasn't, you know, gotten to the point where it's  
9 distilled and you have to factor that in. That's kind  
10 of why it's so open ended on my slide, you know.

11 MEMBER SCHULTZ: Okay. I appreciate that.

12 MR. REED: Does that answer that?

13 MEMBER SCHULTZ: More to come later.

14 MR. REED: I hope.

15 MEMBER SCHULTZ: I hope so too. The other  
16 comment I had, earlier in the discussion you mentioned  
17 several of the other initiatives or programs that are  
18 associated with the NTF response that have an effect  
19 here and also potentially will be affected by what is  
20 going on in this activity.

21 And this applies to all of them but it's  
22 nice to mention those connections but it's also good  
23 to try to determine how those connections are going to  
24 be implemented. You know, we talked about the  
25 schedule here being -

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1 MR. REED: Right.

2 MEMBER SCHULTZ: - driven on a fast track  
3 and some senses I heard, at least in one occasion,  
4 perhaps two, that out of sync with what's going on in  
5 2.1, for example, it would be nice if these things  
6 came together.

7 MR. REED: Yes.

8 MEMBER SCHULTZ: I think the committee  
9 would really like to see more about how the  
10 communications are happening with regard to those  
11 connections and interfaces -

12 MR. REED: The most important one -

13 MEMBER SCHULTZ: - with the other parts of  
14 the program.

15 MR. REED: Yes, sorry. The most important  
16 insight, in my view, is recommendation 8. That's a  
17 full year behind us.

18 So in terms of my schedule and if I was to  
19 at least resolve one issue, I'd want to explicitly  
20 slow this down to be lining up with recommendation 8's  
21 core making, okay. So that the treatment of the FLEX  
22 support guidelines or the mitigating strategies could  
23 be done in that rule making as opposed to mine, okay.

24 So they would go through the process  
25 together and they would - they would be interactive

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1 between the two.

2 I'd point over to Bob Bell, the PM for  
3 that, and say that's where the treatment of the  
4 mitigating strategies is in that rule making, okay.  
5 So that would slow this thing down by one year.

6 So there's an explicit example where if I  
7 at a minimum I would put this thing out until one year  
8 later than what it is and line those two rules up  
9 because they - recommendation 8 and recommendation for  
10 rule makings are very closely tied.

11 The other ones on that list there I think  
12 they get, really, into the guidance and those aren't  
13 as much of a driver for the schedule. You mentioned,  
14 of course, 2.1.

15 That would, of course, have an impact.  
16 But I don't think that affects me directly in terms of  
17 how I structure these requirements. It's more the  
18 feedback from the order, of course. That's incredibly  
19 important.

20 That's the most - the biggest driver and  
21 you know that's - I'm in front of that, okay, and I'm  
22 also in front of 8. So I'm trying to give the  
23 committee some - a more detailed understanding of the  
24 schedule would be at least - I'd move it back at least  
25 one year and I'd probably move it back to where it

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1 makes sense in terms of trying to get the final rule,  
2 okay, for this rule making to be about aligning during  
3 the final implementation of the order as close as  
4 possible because they're basically the same.

5 And I think you would have to have a  
6 little lag now that the implementation of the order  
7 goes all the way to the end of 2016.

8 So if you want to do this at a normal  
9 process and forgetting expediting anything we're on  
10 now this would go into at least 2017 so I can see  
11 whether in fact ultimately that our implementation for  
12 everybody under the order resulted in deviations or  
13 exceptions to the order or there were problems and so  
14 that I don't put into the Code of Federal Regulations  
15 something that doesn't get me out of completely  
16 crossways with that order.

17 Okay. So because they're really very  
18 closely linked. So that kind of puts me back to the  
19 firewall way back into end of 2016 or 2017. In the  
20 proposed rule it would be no sooner than a full year  
21 later and if you want to know what - if it was me I  
22 would have a schedule that would a lot more like that.

23 Of course, I would give another full year  
24 of interaction that's potential for this committee and  
25 also to consider some of these issues that we've also

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1 - we talked about around the table today. So I'm  
2 trying to give you a little bit more detail, I  
3 understand. I was very - kind of a little bit -

4 MEMBER SCHULTZ: Verbally is good but I  
5 would also recommend you do that diagrammatically so  
6 that -

7 MR. REED: Okay.

8 MEMBER SCHULTZ: - these interconnections  
9 can be displayed because even though ideally  
10 recommendation 8 in this effort would come together  
11 and would end at the same date and that would be  
12 wonderful.

13 But the other part of that is that even  
14 though they're a year later than you there is activity  
15 ongoing. There are preparatory work that is being  
16 done there that also needs to somehow feed into this  
17 process.

18 And so how that would happen in the  
19 absence of it coming together all at the end would be  
20 something that - you know, to be investigating.

21 MR. REED: Yes. Right now the way it  
22 would work, and this is not a good situation, would  
23 I'd be - I'd put my rule out first, okay, and that  
24 rule - my rule will have some sort of requirements  
25 placed on the strategies themselves in terms of

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1 exercises or drills or testing and that kind of thing.  
2 Exercises and drills and training really - is really  
3 the thing here.

4 And then Bob would come along with  
5 recommendation 8 later on and say - probably be about  
6 15 or 16 months later, okay, and he's going to do the  
7 training and exercises for all of this stuff and he  
8 would extract out of my rule and put it into his rule,  
9 you know, just to give you an example of how this gets  
10 a little bit crazy.

11 MR. CHEOK: And I think you all are saying  
12 - you both are saying the same thing.

13 MR. REED: Yes.

14 MR. CHEOK: I mean, what you are proposing  
15 is to actually map it out -

16 MR. REED: Map that out.

17 MR. CHEOK: - our table so that when we  
18 are going forth with this recommendation 4 rule that  
19 we are taking into account everything that's being  
20 considered and talked about in recommendation 8.

21 And so when they go forth in their rule  
22 making they will already have this road map mapped out  
23 for them and they will be consistent with us.

24 MEMBER CORRADINI: I guess - I think  
25 Steve's idea is great but I guess I assumed the Japan

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1 task force had this all on paper already.

2 MR. CHEOK: Not to the level of details  
3 that probably - that's going to be needed.

4 MEMBER CORRADINI: Well, the high levels -  
5 I figured you systems engineers had it all figured  
6 out.

7 MR. REED: It's, again, a drawing with all  
8 my lines on it and they would be down to this kind of  
9 level.

10 MR. CHEOK: And, you know, I think it's  
11 optimum to have both rule makings go out at the same  
12 time but logistically it's going to be a nightmare to  
13 have two or three different rules hit the streets at  
14 the same time, both for the staff and for the  
15 industry.

16 MEMBER SCHULTZ: I really wasn't talking  
17 about having the Gantt Chart be perfect. I was  
18 really talking about making sure that the interactions  
19 were, in fact, are happening because as we've seen in  
20 other areas there's valuable information that's being  
21 done over here that is not necessarily affecting us -  
22 the program, another area, and it's because of the  
23 same issues.

24 We have to move forward so we don't - you  
25 know, we'd love to have their input but we have to

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1 move forward and that's not a good situation - the way  
2 to work it. But that's all right. It should not be  
3 on a collision course either.

4 MR. CHEOK: Maybe next time when we come  
5 back in March we'll talk to you about a draft rule we  
6 can have at the beginnings of such a road map.

7 CHAIRMAN SHACK: That would be helpful.  
8 Thank you.

9 Any additional comments? Well, thank you  
10 very much. It was a tour de force presentation, Tim.

11 MR. REED: Thank you. I didn't need  
12 anybody beside me and didn't want my water.

13 CHAIRMAN SHACK: The odds - you were going  
14 pretty good but it was all safe and controlled.

15 MR. CHEOK: I picked this seat for a good  
16 reason.

17 MEMBER STETKAR: You see - you see the  
18 bruises. They choreographed this thing, you know, or  
19 something.

20 CHAIRMAN SHACK: Well, we're adjourning  
21 then. Thank you very much.

22 (Whereupon, the above-entitled meeting  
23 concluded at 11:53 a.m.)  
24  
25

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# Station Blackout/Mitigating Strategies Rulemaking

Advisory Committee on Reactor Safeguards  
Regulatory Policies and Practices Subcommittee

December 5, 2012

# Purpose

- Provide the ACRS with a status of our rulemaking activities
  - Status on efforts to develop the regulatory basis and proposed rule
  - Current thoughts on draft rule language
- Obtain ACRS feedback to inform our rulemaking efforts going forward

# Background

- Commission direction:
  - Initiate rulemaking with an Advanced Notice of Proposed Rulemaking (ANPR) in SRM-SECY-11-0124
  - Use a performance-based regulatory approach similar to B.5.b requirements (now 10 CFR 50.54(hh)(2))
- NRC published the Station Blackout (SBO) ANPR on March 20, 2012
  - To gather feedback to support regulatory basis development
- Staff held Category 3 public meeting with stakeholders on April 25, 2012
  - To inform stakeholders and support improved written comment
- ANPR comment period ended on May 4, 2012
  - 45 comment submissions

# NTTF Recommendations

- This action stems from the Near Term Task Force (NTTF) Report
- NTTF Report recommendations most directly involved are:
  - NTTF 4.1 – driving force for the SBO Rulemaking
  - NTTF 4.2 – evolved into the Mitigating Strategies Order (EA-12-049)
- Additional NTTF Recommendations that relate to this rulemaking effort include:
  - Recommendation 8 rulemaking - “Onsite Emergency Response Capabilities”
  - Recommendation 9.3 request – staffing and communications
  - Recommendation 7.1 Order – Spent fuel pool level instrumentation
  - Recommendation 5.1 Order – BWR Mark I and II Vents
- Most of the remaining NTTF recommendations have some connection

# ACRS Feedback

- From October 13, 2011, memorandum - staff should:
  - Issue an ANPR
  - Require licensees to provide an assessment of capabilities to cope with an extended SBO:
    - System vulnerabilities
    - Capabilities to mobilize resources
    - Delivery of offsite resources
- Staff asked for feedback on these issues in the ANPR
  - Capability assessment in integrated plans

# ACRS Feedback Cont'd

- ANPR feedback on ACRS thoughts:
  - The issues raised are being addressed as part of EA-12-049 implementation
  - New plants should be examined through the combined license and design certification process
- EA-12-049 was issued on March 12, 2012
  - Largely bounded all of NNTF Recommendation 4
  - Performance-based approach
  - As a result - feedback and lessons-learned from implementation of EA-12-049 is key



# Evolution of the Regulatory Approach

- Staff considered feedback from all sources:
  - 45 sets of comment submissions from ANPR (NRC-2011-0299)
  - Feedback received through development of NEI 12-06 and JLD-ISG-2012-01 (Mitigating Strategies Order implementation guidance)
  - Internal discussions with JLD steering committee including feedback from other ongoing post-Fukushima efforts
- Staff's thinking has evolved substantially

# Key and Early Insights

- EA-12-049 initiating events are unbounded in terms of the “beyond-design-basis external events” – the bounds are set in the implementing guidance
- Traditional success criteria cannot be established – instead we must establish a framework with procedures, guidance, and equipment to give operating staff the best chance to mitigate the beyond-design-basis events as the objective
- Applying “special treatment” assurance requirements (e.g., equipment qualification) would likely add large costs with little safety return
- Developing the mitigating strategies for beyond-design-basis external events should result in a bounding approach for the mitigation of loss of all alternating current (ac) conditions under more benign conditions

# Key and Early Insights Cont'd

- Regardless of the cause of the “loss of all ac” mitigating strategies requirements apply
- 10 CFR 50.63 requirements to withstand and recover for a specified duration are no longer limiting requirements; licensees must maintain/restore functions indefinitely per Order EA-12-049
  - Coping time determinations may no longer add value *per se*
- Flexibility should be afforded to designers to support use of strategies that rely on design rather than human action
- The mitigating strategies can be built on the work done in Regulatory Guide 1.155/NUMARC 8700 (that supported 10 CFR 50.63) – but become more involved due to the event conditions, duration, and severity

# Draft Rule – Current Thoughts

- All necessary changes to the regulations are part of making EA-12-049 generically applicable
  - All changes stem from adequate protection provisions
- Making EA-12-049 generically applicable drives 10 CFR 50.63 change:
  - EA-12-049 requirements apply regardless of the event sequence that leads to a “loss of all ac power” condition, whether from a beyond-design-basis-external event or from a loss of offsite power with failure of the onsite emergency ac system (e.g., failure of two emergency diesel generators (EDG))
  - 10 CFR 50.63 specified duration determinations per Regulatory Guide 1.155 are outdated and the more restrictive EA-12-049 adequate protection requirements to have strategies that maintain or restore key functions apply
  - If left as is, 10 CFR 50.63 could lead to confusion regarding the governing requirements that must be met should a loss of all ac power condition occur

# Draft Rule – Current Thoughts

## Cont'd

- Ongoing implementation efforts at the procedures/guidance level are consistent with this (i.e., the way industry's FLEX guidelines fit into the plant procedures)
- Staff believes that it is important to maintain:
  - Alternate ac (AAC) power sources that were put in place for 10 CFR 50.63
  - EDG reliability
- Staff recognizes that the initial phase (using installed capacity) of mitigating strategies established to address beyond-design-basis external events should bound "10 CFR 50.63" SBO sequences
  - Need feedback from order implementation to confirm this view
  - This issue will likely be discussed in either the proposed rule or statements of consideration and may include consideration of reasonable minimum times (using installed capacity) to withstand conditions

# Draft Rule –Current Thoughts Cont'd

- Staff believes that there could be more flexibility in the proposed rule than provided by the Order
- Robust AAC sources could be allowed
  - Meet General Design Criterion 2 and  $\geq$  available physical margin
  - Independent, diverse, and separate from current 1E ac power sources
  - Multiple and separate supply paths to all emergency ac buses
  - Requirements for portable independently powered equipment as a last means of defense would remain
- Perhaps alternatives such as that being pursued by R.E. Ginna should be allowed:
  - Local diesel generator powering motor-driven auxiliary feedwater pump with 24 hour Cat. 1 seismic water source (robust decay heat pump)

# Next Steps

- Staff continues developing the proposed rule and supporting regulatory basis
- Challenging schedule
  - Order implementation: Guidance issued 8/12; Plans to be submitted; 2/28/2013; Implementation: 2 refueling outages - no later than 12/2016
  - Proposed rule due: April 2013 (4/4/13 to EDO, 4/18/13 to Commission)
  - Final rule due: April 2014 (4/4/14 to EDO, 4/18/14 to Commission)
  - Future ACRS interactions:
    - Proposed rule – March 5, 2013 (S/C), and April 11-13, 2013 (F/C)
    - Final rule – March 4, 2014 (S/C), and April 10-12, 2014 (F/C)