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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 PROCEDURES SUBCOMMITTEE

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TUESDAY, APRIL 23, 2013

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ROCKVILLE, MARYLAND

The Subcommittee met at the Nuclear Regulatory Commission, Two White Flint North, Room T2B1, 11545 Rockville Pike, at 1:00 p.m., William J. Shack, Chairman, presiding.

SUBCOMMITTEE MEMBERS:

WILLIAM J. SHACK, Chairman

J. SAM ARMIJO, Member

DENNIS C. BLEY, Member

CHARLES H. BROWN, JR., Member

HAROLD B. RAY, Member

MICHAEL T. RYAN, Member

STEPHEN P. SCHULTZ, Member

GORDON R. SKILLMAN, Member

JOHN W. STETKAR, Member

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NRC STAFF PRESENT:

CHRISTINA ANTONESCU, Designated Federal Official

CHARLIE ADER, NRO/DPR

ERIC BOWMAN, NRR/DPR

MIKE CHEOK, NRR/DE

SHANA HELTON, NRR/DPR

MATT McCONNELL, NRR/DE/EEEB

EILEEN McKENNA, NRO

TIM REED, NRR/DPR/PRB

ALSO PRESENT:

PATRICIA CAMPBELL, GE-Hitachi\*

BILL BERG, GE-Hitachi\*

JOHN FLACK

\*Present via telephone

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

12:59 p.m.

CHAIRMAN SHACK: Okay. The meeting will now come to order. This is a meeting of the Regulatory Policies and Practices Subcommittee. I am Bill Shack, Chairman of the Subcommittee. ACRS Members in attendance are Steve Schultz, Dick Skillman, Dennis Bley, Harold Ray, Sam Armijo, John Stetkar and Mike Ryan and Charlie Brown will be here in a few seconds. Christina Antonescu of the ACRS Staff is the designated federal official for this meeting.

During this meeting, the staff will provide a status of the Station Blackout Rule. The goal of the staff is to discuss the draft regulatory basis for the Station Blackout Mitigation Strategies Rulemaking, in particular the Regulatory Basis document entitled "Rulemaking for Station Blackout Mitigation Strategies."

This is issued really in conjunction with the implementation of Mitigating Strategies Order EA-12-049.

The Subcommittee will gather information and analyze relevant issues and facts and formulate proposed positions and actions as appropriate for deliberation by the full Committee.

The rules for participation in today's meeting have been announced as part of the notice for this meeting, previously published in the Federal Register on April 8,

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1 2013.

2 We have received no written comments or  
3 requests for time to make oral statements from members  
4 of the public regarding today's meeting.

5 We have requests for phone bridge line  
6 connections for listening to the discussion. These are  
7 Edward Bates, Fukushima Response Team, Nine Mile Point  
8 Nuclear Station; Gregg Pitts, Fukushima Regulatory  
9 Response Team, Constellation Energy Nuclear Group, Nine  
10 Mile Point Nuclear Station; and Georgia Thu, ICF  
11 International, who is supporting Tim Reed in the  
12 rulemaking; Patricia Campbell, Washington Regulatory  
13 Affairs, GE-Hitachi Nuclear Energy.

14 If anyone is on the line, please, identify  
15 yourself, just to know the line is open.

16 MS. CAMPBELL: Hello, this is Patricia  
17 Campbell with GEH.

18 CHAIRMAN SHACK: Okay.

19 MR. BYRD: And this is Bill Byrd with GEH as  
20 well.

21 CHAIRMAN SHACK: Okay. To preclude  
22 interruption of the meeting, the phone line will be placed  
23 on listen-in mode during the discussions and the  
24 presentations.

25 A transcript of the meeting is being kept and

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1 will be made available as stated in the Federal Register  
2 notice. Therefore, we request that the participants in  
3 this meeting use the microphones located throughout the  
4 meeting room when addressing the Subcommittee.

5 The participants should first identify  
6 themselves and speak with sufficient clarity and volume,  
7 so they may be readily heard.

8 We will now proceed with the meeting. I will  
9 call upon Mr. Mike Cheok, Deputy Director for Engineering  
10 in the Office of Nuclear Reactors Regulation, to provide  
11 some introductory remarks.

12 MR. CHEOK: Thank you. Good afternoon.  
13 It's a pleasure to be here to address the Subcommittee  
14 on our rulemaking activities for Station Blackout and for  
15 the Mitigating Strategies Order.

16 The last time we were here was December 5,  
17 2012. And at that meeting, I think we heard from the  
18 Subcommittee that we need to be mindful of keeping track  
19 of all our integrations of all the NTTf activities and  
20 also that potentially that we did not have enough time  
21 to complete all our Station Blackout activities as part  
22 of recommendation for an efficient and effective manner.

23 So the staff has been busy for the last four  
24 months. Since December, we have requested via a COMSECY  
25 that we combine phone activities in Recommendation 4 and

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1 combine that also with Recommendation 7, which discussed  
2 spent fuel pool instrumentation and spent fuel pool  
3 coolant.

4 Staff also requested a change in schedule,  
5 so that we can take into account the lessons learned from  
6 the implementation of the spent fuel pool, implementation  
7 of the mitigating strategies order into our Station  
8 Blackout Rulemaking.

9 Also, since December, we have been busy  
10 drafting up a draft regulatory basis. We have since put  
11 this regulatory basis out for public comment, with a comment  
12 period that runs from April 10 to May 28.

13 Our objective today is to talk to you about  
14 our draft regulatory basis. We are looking for ACRS  
15 feedback and we will use this feedback to help us come  
16 up with our proposed rule. This proposed rule is now due  
17 to the Commissioners in June of 2014.

18 We have Tim Reed to talk about the regulatory  
19 basis. Eric Bowman will talk about the status of the  
20 mitigating system strategies. And Eileen McKenna from  
21 NRO will talk about and answer any questions that deal  
22 with reactors.

23 So, Tim?

24 MR. REED: Thanks, Mike. Why don't we go to  
25 the purpose then. I think Mike has already hit it, but

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1 I'll just mention it again.

2 We have taken an opportunity here to get back  
3 and talk to you all since last December and interact with  
4 you on the draft regulatory basis. I hope you have gotten  
5 an opportunity to look at it, because I think any feedback  
6 that we hear, we certainly will listen to it. It will  
7 help us finalize the reg basis as well as moving forward  
8 to try to do a better job with the proposed rule and hit  
9 a good target.

10 You know, so this -- you know, with the new  
11 schedule Mike just referred to, this provides us an  
12 opportunity to do rulemaking in a better way. Now, we  
13 are using these regulatory basis interactions, like today,  
14 to try to do better rulemaking and hopefully we accomplish  
15 that.

16 So as you are well-aware, that basis document  
17 has really two parts to it. The main part, of course,  
18 being justifying rulemaking. That was pretty obvious that  
19 we were going to do rulemaking, but we know the last time  
20 through we did that and then we took this opportunity then  
21 to try to capture a snapshot, if you will, of our thoughts  
22 on draft rule concepts, we are calling them, that's in  
23 the appendix. And that's probably the most interesting  
24 thing for the Committee. And I suspect that's probably  
25 where most of our feedback will come from.

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1           So we put that out there for stakeholders also  
2 and I hope we get some good feedback and it helps us moving  
3 forward to finalize rule language, proposed rule language.

4           So, again, thanks for the opportunity of being  
5 back here. And I hope we have as good of an interaction  
6 today as we had on December 5<sup>th</sup>, that was, I thought, a  
7 very good one.

8           So as Mike just mentioned, the second bullet  
9 there, we put together a memorandum to the Commission that  
10 become COMSECY-13-0002 and allowed us to do a good thing,  
11 consolidate two sets of regulatory actions stemming from  
12 the Near-Term Task Force report. The actions are  
13 associated with Recommendation 4, which were already inside  
14 this rulemaking, as well as the action supporting the spent  
15 fuel pool activities.

16           And so they naturally flow right into this,  
17 because they naturally work in terms of mitigation, the  
18 mitigation strategies and the guidance for the order.  
19 So that was a very easy thing to do, to roll those in,  
20 and I think they will be very smooth.

21           The biggest point for me though was to get  
22 the alignment of the schedule, so that we didn't have to  
23 do things so rushed. We argued successfully. The  
24 Commission agreed that the mitigating strategies order  
25 was addressing the near-term safety issues and that would

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1 provide us sufficient time to do rulemaking in a much better  
2 manner. And so now we can do a reg basis first and then  
3 propose final rule.

4 And you see the schedule there, next June would  
5 be the proposed rule. Actually, we have got near-term  
6 thing in July and informing the Commission about the reg  
7 basis, July 8<sup>th</sup>. And then next June of 2014 would be the  
8 proposed rule, so that's more time.

9 And then the final rule is actually lined up  
10 to be December 2016 and if you will recall, that is the  
11 final implementation date for the mitigating strategies  
12 order. So we lined those two up, so that we don't get  
13 out of phase time-wise and set ourselves up for some  
14 situation there where we are disconnected from the orders.

15 That solves some problems there. So that's  
16 the new schedule and this is the new scope and this is  
17 where we are at today. And that is what has happened since  
18 last time. I think last time you will recall I was doing  
19 a lot of whining, I guess it was, about the rule, the process  
20 of how the work will be informed by the order.

21 This allows us now to be informed, at least  
22 to some extent now. It's still, you know, not perfect,  
23 but we do have all the integrated plans in-house. We are  
24 starting to get some idea of that. We will get some more  
25 feedback from that. And then at the proposed rule, we

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1 will have a lot more feedback.

2 And I suspect in the proposed rule comment  
3 period even more, if you start looking at the schedule,  
4 then we will find out where the rubber is really hitting  
5 the road, what is happening out there. Okay. But, you  
6 know, the licensees are out there making modifications  
7 already. They have made some modifications already with  
8 connections or what have you and they have purchased a  
9 lot of this equipment already.

10 So there is a lot going on right now. So  
11 that's the schedule. And that's the scope. And if you  
12 want, I can hold up on every slide or just keep rolling.

13 CHAIRMAN SHACK: Just --

14 MR. REED: Okay. Whatever. And feel free  
15 to jump in and I'm sure you will. And you can talk about  
16 -- you can ask anything. How's that? I'm not going to  
17 restrict it.

18 MR. BOWMAN: One thing I would mention, this  
19 is Eric Bowman I'm here for the mitigating strategies order,  
20 I do not have a separate set of slides to go through for  
21 what we have seen in the reviews of the integrated plans  
22 so far. We have only gotten part way through the first  
23 two of them doing a thorough review.

24 We have taken a look at the other ones. I  
25 can give you a general flavor for what we are seeing, but

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1 probably most appropriate when questions come up during  
2 Tim's presentation, I'll interject what we are seeing with  
3 the --

4 CHAIRMAN SHACK: Well, let me just ask one  
5 question about that. There was considerable feedback from  
6 the industry. They didn't like this notion that you would  
7 come out with orders for specific facilities and license  
8 conditions. Is that still the way this is going to be  
9 handled? You're going to look at these implementing plans  
10 and review them and then issue additional facility-specific  
11 orders?

12 MR. BOWMAN: Right now what we are looking  
13 at is just doing the safety evaluations of the plans and  
14 site-specific implementation inspections. We don't  
15 anticipate a need to amend the orders after the safety  
16 evaluations or impose licensed conditions because the  
17 requirement is already there in the order as it is.

18 We do have that option available, of course,  
19 if it's appropriate to do so, but it's not going to be  
20 an across the board kind of thing.

21 CHAIRMAN SHACK: So you will do a full review  
22 to come up with a safety evaluation of each of these  
23 implementation plans including, for example, any analyses  
24 they have done for, Harold's favorite topic, seal leakage?

25 MR. BOWMAN: Yes.

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1 MEMBER RAY: Call it the hole in the  
2 filtration that requires constant cooling to not become  
3 a hole.

4 MR. BOWMAN: We will be doing safety  
5 evaluations, but bear in mind that the safety evaluations  
6 we are doing are of their plans to develop the guidance  
7 and strategies that are required by the order.

8 CHAIRMAN SHACK: Okay. So they are --

9 MR. BOWMAN: And will be --

10 CHAIRMAN SHACK: -- still a long way  
11 from --

12 MR. BOWMAN: And won't be as comprehensive  
13 as a typical safety evaluation might be for a proposed  
14 license amendment, but -- and that's why we are also going  
15 out and doing the site-specific verification inspection.

16 So there will be, obviously, things that we can't check  
17 until we get to the field and see what they have done.

18 CHAIRMAN SHACK: And those inspections will  
19 be done when?

20 MR. BOWMAN: The following full compliance  
21 date will be working with the regional offices to set up  
22 appropriate times. The full compliance date for the  
23 facility they are set at the completion of the second  
24 refueling outage following the issuance of the interim  
25 staff guidance, which was last August and the submittal

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1 of the integrated plans. This was done in order to be  
2 able to not have them all happen at once. It will be  
3 sequential.

4 CHAIRMAN SHACK: But I mean, they are moving  
5 ahead, presumably, while you are doing your reviews.

6 MR. BOWMAN: Yes.

7 CHAIRMAN SHACK: I mean --

8 MR. BOWMAN: Yes.

9 CHAIRMAN SHACK: -- all this is sort of going  
10 on together.

11 MR. BOWMAN: Oh, yes, yes. The first two  
12 plants we are going to go visit will be in 2014. My  
13 intention right now is to schedule the inspection visits  
14 following the full compliance date for all the units on  
15 a site, for multiple unit sites, so that we avoid -- so  
16 it's more a efficient way of going through and doing  
17 verification.

18 CHAIRMAN SHACK: All right.

19 MEMBER STETKAR: What's your schedule for  
20 issuing the SERs? Are they out in 2014?

21 MR. BOWMAN: It's going to be very soon.

22 MEMBER STETKAR: Oh.

23 MR. BOWMAN: Our intention to do is we are  
24 issuing requests for additional information and at the  
25 same time preparing a safety evaluation including open

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1 items on those --

2 MEMBER STETKAR: Oh, okay. So you are going  
3 to have a draft with open items?

4 MR. BOWMAN: Yes.

5 MEMBER STETKAR: Okay.

6 MR. BOWMAN: And then once we get the  
7 responses, if we don't get it quickly enough before we  
8 issue the safety evaluation to close the open items, then  
9 we will go and close the open items later.

10 MEMBER SCHULTZ: It may be just a few coming  
11 in in 2014, but then there will be a deluge of the --

12 MR. BOWMAN: There is about 21 sites we will  
13 be needing to do in 2015 and the rest in 2016.

14 MEMBER SCHULTZ: Okay. Thank you.

15 MR. REED: Why don't we go to Slide 4 then?

16 A little more background. Obviously, this action is  
17 closely linked to the mitigating strategies order. I mean,  
18 it's pretty apparent. But we are also closely linked to  
19 Recommendation 8, which I think most of the Committee is  
20 on. Remember when Bob Beall came here a couple months  
21 back and provided you the Draft Reg Basis at that point  
22 in time, so you are familiar with that.

23 And that is because, of course, these  
24 mitigating strategies become another set of guidance and  
25 strategies that fit within the entire set of procedures,

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1 guidances, strategies, the EOPs, the SAMGs, the EDMGs and  
2 now the mitigating strategies. So that will be treated  
3 and our intent is to treat that there, that's the most  
4 appropriate place. So we are linked to that.

5 And, of course, 9.3 in exercises and drills  
6 overlaps once again on top of that. So there is -- those  
7 are three obvious linkages, but we are kind of the center  
8 hub, if you will. 2.1 is very, very important feedback  
9 from 2.1. In fact, the expedited -- I believe that is  
10 going to be called Expedited 2.1 Effort and seismic is  
11 on the installed Phase 1 equipment, so that's the mitigating  
12 strategies equipment. So it, obviously, is an influence.

13 We are always seeing, you know, short  
14 near-term enhancements being done and flooding in --  
15 flooding inside makes -- a lot of stuff happening from  
16 2.1 feeding into it and then, of course, if you do change  
17 that external design basis, that has a very significant  
18 effect as we mentioned in the regulatory basis.

19 So we are, obviously, linked into that, but  
20 we also, of course, are linked in from Mark 1s and Mark  
21 2s --

22 MEMBER RAY: I'm sorry.

23 MR. REED: -- into -- yes, sir?

24 MEMBER RAY: Well, I just want you to  
25 elaborate on that a little bit. I mean, I understand why

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1 you say it's linked in, but if the design basis changes,  
2 what's the point that you are making?

3 MR. REED: It would affect reasonable  
4 protection, because if you recall right now, our intent  
5 right now is to continue with this. The protection of  
6 the portable flex equipment, what the industry calls flex,  
7 what we call mitigating strategies, is reasonable  
8 protection. And that's something that basically a design  
9 basis kind of protection.

10 So if you change that, for example, your  
11 external bed becomes moister, let's say your hazard, you  
12 are a water hazard to a different level now.

13 MEMBER RAY: Yes.

14 MR. REED: Where you place that equipment may  
15 no longer be reasonably protected. So it could have a  
16 very real impact on the portable equipment as well as on  
17 the installed equipment. You know, most -- I'm thinking  
18 mostly like turbine-driven aux feedwater pumps and the  
19 most important critical core cooling type stuff.

20 MEMBER RAY: I guess I --

21 MR. REED: I mean, that I know of, yes.

22 MEMBER RAY: -- was just thinking that maybe  
23 you were suggesting that equipment that is provided now  
24 and in the future for beyond design basis events would  
25 also meet a change in the design basis. But you are not

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1 saying that, are you?

2 MR. BOWMAN: Yes, sir, we actually are. Part  
3 of the guidance that was put forward that we endorsed is  
4 being acceptable to meet the requirements of EA-12-049.

5 It requires a look -- configuration control so that changes  
6 in the design basis would affect the protection that's  
7 afforded to the equipment. So it's --

8 MEMBER RAY: Well, the change in the design  
9 basis --

10 MR. BOWMAN: -- a feedback basis.

11 MEMBER RAY: -- affects the mitigating  
12 equipment. I understand that.

13 MR. BOWMAN: Yes.

14 MEMBER RAY: But if you change the design  
15 basis, I guess I was assuming, you would then have to ensure  
16 that the equipment that is there to meet the design basis,  
17 leaving aside the beyond design basis equipment --

18 MR. BOWMAN: Yes.

19 MEMBER RAY: -- would have to be modified,  
20 upgraded, revised as necessary.

21 MR. BOWMAN: Yes. And that's another area  
22 where there is a strong interaction between what we are  
23 doing under the Mitigating Strategies Order and what the  
24 other group of people that are doing the recommendations,  
25 2.1 reevaluations are doing.

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1           There was an interim staff guidance  
2 JLD-ISG-2012-05 that came out, I think, in November on  
3 integrated assessments following the flooding  
4 reevaluations. If there is a flood reevaluation that shows  
5 a potentially higher probable maximum flood, the integrated  
6 assessment process looks at the mitigating strategies  
7 equipment and strategies using the PRA and an HRA to see  
8 could it be used as part of the inputs into the answer  
9 to the question whether or not it is appropriate to change  
10 the design basis protection for the installed equipment.

11           MEMBER RAY: Okay. I understand. But  
12 that's just a question that has to be answered. It isn't  
13 something that is automatic or --

14           MR. BOWMAN: Right. And it would be go  
15 through the whole back-fit process to modify the design  
16 basis protection, GDC-2 level of protection for the  
17 installed equipment under the currently existing  
18 processes.

19           CHAIRMAN SHACK: But just since we brought  
20 this topic up, it's kind of out of place, but I'm not sure  
21 where it would fit in better. Coming back to the proposed  
22 rule and the mitigating order, it is all key towards beyond  
23 design basis accidents. And when we deal with floods,  
24 NEI-1206, there is actually some words that well you to  
25 consider things beyond the design basis flood.

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1 All the seismic stuff is key to the SSE. Why  
2 isn't it key to -- except for the AP-1000, which does,  
3 in fact, have seismic margin requirements, why isn't the  
4 beyond design basis equipment key to something like a review  
5 level earthquake?

6 MR. BOWMAN: Well, when we initially got the  
7 SRM on, what was it, SECY-11-0093, we were directed to  
8 defer Recommendation 1 until later and these currently  
9 exist in regulatory processes for the orders. So because  
10 of that, bear in mind that the Near-Term Task Force  
11 Recommendation 4.1, which we took a lot of the elements  
12 out of in combination with the elements that were in  
13 recommendation 4.2 to form the nucleus, if you will, of  
14 the Order EA-12-049, included in it the establishment of  
15 an extended beyond design basis limit of about one level  
16 or 15 to 20 feet above the design basis flood level for  
17 the protection of the 8-hour coping equipment that would  
18 be installed for the deterministic 8-hour and 72-hour,  
19 I believe it was, time period for the coping with installed  
20 equipment and coping with portable equipment on-site.

21 Given that the Commission directed us not to  
22 establish an extended design basis limit, we didn't feel  
23 -- we did not have a mandate to require a change there  
24 and we didn't have any good technical basis to establish  
25 a limit other than what the limits that have actually been

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1 established are.

2 What we saw as a --

3 CHAIRMAN SHACK: All right. We have beyond  
4 design basis accidents for new reactors. We know what  
5 a beyond design basis seismic -- we don't ask them to design  
6 for any possible earthquake. We ask them to design for  
7 1.67. I mean, why -- that's sort of our acceptant idea  
8 of beyond design basis for new reactors. Why isn't it  
9 now applicable --

10 MR. REED: As forward-fitting versus  
11 back-phase --

12 MR. BOWMAN: Yes.

13 MR. REED: -- it's all different ways.

14 MR. BOWMAN: It also wouldn't work that well  
15 for the --

16 CHAIRMAN SHACK: But the mitigating -- I mean,  
17 when you say mitigating strategies beyond design basis,  
18 you have to have some notion of how far design basis --  
19 beyond design basis you are willing to go. And that just  
20 seems to me -- well, you asked the same question when you  
21 were reviewing 1206 of your view graphs.

22 MR. REED: I think the way we are doing it  
23 right now is I teased it apart. I think this is what we  
24 are doing. If there is a reestablishment of current  
25 licensees of their external design basis, that happens

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1 under 2.1. That's the place for it to happen, because  
2 you can do that thoroughly, carefully, a well-done  
3 technical job and that's the way it should be. And it  
4 should be a function of where -- the facility and events  
5 that apply there.

6 And some of that is coming -- is happening  
7 already, we have just mentioned, we have heard. So some  
8 of that feedback is already starting to happen, but that's  
9 the place for that to happen.

10 When that does happen, as we mentioned, that  
11 can have an adverse impact on what we are doing, mitigating  
12 strategies, but I see mitigating strategies as really  
13 another capability that is put in place to address  
14 uncertainties associated with beyond design external beds.

15 That's a little bit different and that's how I see it  
16 accomplishing. I think that's what it does accomplish.

17 As far as how far beyond, it's not much beyond,  
18 to be honest with you. You know, n plus 1 sets protected  
19 differently around the facility, it's more. It's a new  
20 beyond type of protection, but not a lot, I don't think.

21 And probably we should clarify in this document just  
22 exactly how much we do and how much we don't do.

23 I think that's one of the things we have  
24 already heard we want to do by the final draft regulatory  
25 basis. What we are really accomplishing with mitigating

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1 strategies versus going beyond the current license basis  
2 under GDC-2 Part 100 and that's really NTTF 2.1.

3 So I don't know if that makes sense, but I  
4 see those as being --

5 CHAIRMAN SHACK: Well, but I mean, 221 still  
6 only gives me a new SSE.

7 MR. REED: That's right. But it's --

8 CHAIRMAN SHACK: And I decide how far I'm  
9 going to --

10 MR. REED: -- at the full --

11 CHAIRMAN SHACK: -- go beyond the design  
12 basis. I'm still left with that question of --

13 MR. REED: I don't -- well, what I guess I  
14 say is I don't just go out there and arbitrarily go beyond  
15 something I have a basis for, is what I'm saying.

16 MR. BOWMAN: Where we started from was the  
17 NTTF recommendations and the -- and of particular note,  
18 the NTTF had not recommended any margin for seismic. The  
19 only area they recommended margins for was the flooding  
20 event and we did take --

21 CHAIRMAN SHACK: You say beyond design basis  
22 external events and it's certainly an external event.

23 MR. REED: Oh, I hear you.

24 MR. BOWMAN: Yes.

25 MR. REED: And I think we need to clarify that.

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1 MR. BOWMAN: It is and it will be clarified,  
2 but the one area where we did go beyond the design basis  
3 for the case of a licensee at a facility where there is  
4 a nearby or adjacent -- another licensee or an early site  
5 permit or a combined license application, we require  
6 through the guidance, so-called, requires is probably going  
7 beyond what I should call it reference to the new license  
8 probable maximum flood.

9 And you can see, for example, in the overall  
10 integrated plan for the mitigating strategies order for  
11 Millstone 2, they provide protection for their portable  
12 equipment at the level for the probable maximum flood at  
13 Millstone 3, which is about a foot and a half higher.

14 I haven't gone through all the rest of them  
15 where there are co-located units or nearby ESPs, etcetera,  
16 with higher probable maximum flood levels, but that is  
17 an example of where we went beyond design basis. And it  
18 is -- you know, I have heard before from Members of the  
19 Committee that for any beyond design basis level that I  
20 postulate, it is possible to postulate something that is  
21 an inch higher.

22 So I needed to use something that I could  
23 regulate and enforce and point to the establishment of  
24 that number with technical rigor as opposed to a number  
25 that is just arbitrarily chosen and I can move everything

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1 up a level. We can't just take that. It doesn't make  
2 sense because given the -- that we have accepted that there  
3 are uncertainties in the determination of extreme event  
4 levels, any number I pick could be too low or it could  
5 be too high.

6 So we went with we will set the level of  
7 protection that's necessary for the portable equipment  
8 at the design basis level, taking into account additional  
9 information that a licensee may have due to the existence  
10 of previously established probable maximum flood levels  
11 that have been established and accepted based on technical  
12 rigor.

13 MR. REED: Well, I guess I'm --

14 MEMBER STETKAR: And what happens when we get  
15 the flood that is higher than that flood that has just  
16 been arbitrarily set by attorneys and everything fails?  
17 What happens to the nuclear industry and the regulators  
18 when that event happens?

19 MR. REED: Well, I mean, and this is obviously  
20 a reference back to Fukushima, but, you know, I'll be pretty  
21 blunt, Fukushima was not an unknown beyond design basis  
22 event. It was a known beyond design basis event. And  
23 so --

24 MEMBER STETKAR: Either -- are accelerations  
25 above the design basis, seismic acceleration --

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1 MR. REED: They were --

2 MEMBER STETKAR: -- not unknown  
3 acceleration.

4 MR. REED: Absolutely, yes, yes.

5 MEMBER STETKAR: Here in the United States.

6 MR. REED: Oh, now, you are outside of  
7 my -- not that I won't, but you are --

8 CHAIRMAN SHACK: Well, I mean, I can  
9 understand that it's difficult to address this in general,  
10 because one would somehow have to look at the uncertainties  
11 and the consequences. I mean, you know, in some cases  
12 if you went above the maximum possible PMF that maybe it  
13 wouldn't make any difference. You still have got so much  
14 margin or, you know, it's so low anyway.

15 MR. REED: Whether it's low or not, whatever,  
16 yes.

17 CHAIRMAN SHACK: You know, and it's slow,  
18 fast.

19 MR. REED: Right. And you can take  
20 preemptive action or whatever.

21 CHAIRMAN SHACK: Seismic is something we have  
22 wrestled with before and that's what I can't understand  
23 is the reluctance to go. And I'm not sure how much it  
24 would change it really would make to say that, you know,  
25 you go beyond the SSE. We are not asking you for the new

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1 design basis to be up to an RLE level. We are asking for,  
2 you know, some sort of reasonable probability that this  
3 stuff will still work the same way we do with -- in the  
4 new plants with the seismic margin.

5 And it isn't clear to me that when we are  
6 dealing with a beyond design basis external event, that  
7 we have addressed the one. I admit we haven't done that  
8 for the flooding and then there you really are kind of  
9 just out walking around. But I just don't understand the  
10 argument for the seismic case.

11 MR. BOWMAN: Well, my perspective from the  
12 beginning and recognizing that there is existing margin  
13 in the seismic robustness, if you will, of the structure  
14 system to components, parts of the reactor coolant system,  
15 we have got a requirement to protect the SSEs that are  
16 safety-related to a certain level does it make sense to  
17 require the protection of affordable pump to a higher level  
18 than that if we haven't gone back and changed the level  
19 of protection that we are affording --

20 CHAIRMAN SHACK: You know, maybe it's the  
21 weakest link in my system --

22 MEMBER STETKAR: Yes, that portable pump is  
23 saving you from the failures of all --

24 CHAIRMAN SHACK: The other stuff.

25 MEMBER STETKAR: -- that other stuff. It

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1 doesn't make sense.

2 CHAIRMAN SHACK: You know --

3 MEMBER STETKAR: I make that other stuff  
4 indestructible, because you can't.

5 CHAIRMAN SHACK: I'm not too worried in an  
6 AP-1000 where the whole thing is set up, you know, to go  
7 to that, but for the other plants, at least have -- you  
8 know, now maybe we have looked at it in the IPEEE and people  
9 have addressed that, but --

10 MR. REED: Well, I mean, they are looking at  
11 it in 2.1.

12 CHAIRMAN SHACK: Well --

13 MR. REED: The thought that is one approach  
14 and that's pretty conservative to me and those are going  
15 in place. So I think that will make it even more robust.

16 But you know what, you know, if the turbine-driver aux  
17 feedwater pump fails, it is game over, you know? You lost.

18 CHAIRMAN SHACK: Well, but that's --

19 MR. REED: That was an earthquake that was  
20 too big. We can't --

21 CHAIRMAN SHACK: That's the one I would be  
22 looking at.

23 MR. REED: No. Again, that's exactly where  
24 this modification is going to go to. It's for one  
25 expedited. So I know what you are saying, but, you know,

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1 whatever you pick, it can go and give you a worse event.

2 Of course the probabilities of theoretical -- are supposed  
3 to be going down. Again, that's 2.1. I think that, I  
4 personally think that, needs to be done under 2.1. And  
5 whatever that is, it's done well and completely and then  
6 we have a solid basis and then we move from there. And  
7 to me that makes sense.

8 If I can't justify a regulatory space,  
9 something that is beyond that, how do I impose that when  
10 I don't even know what the basis for it is?

11 MR. BOWMAN: It's particularly harder to  
12 impose it --

13 MR. REED: I can't do that.

14 MR. BOWMAN: -- when this isn't being done  
15 as a single stand-alone activity.

16 MR. REED: Yes. That's true.

17 MR. BOWMAN: If this was a single stand-alone  
18 activity and the only thing that was being done as a result  
19 of the fuel damage event at Fukushima, we might be able  
20 to come up with a good solid technical justification for  
21 saying protect stuff with an additional margin of 15 feet  
22 and with an additional seismic margin of 65 percent or  
23 whatever we felt was appropriate.

24 But given that we have a group of individuals  
25 that are establishing with technical rigor based on solid

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1 data or whatever data they can come up with, establishing  
2 the GDC-2 protection which is supposed to be protection  
3 against natural phenomena with sufficient margin to account  
4 for the length of time and the quality of the data that  
5 it's based on, I have difficulty with saying that's a  
6 sufficient margin in the requirement that's proposed under  
7 GDC-2 is not good enough.

8 MR. REED: And I would just bring it back to  
9 why we are here because of Fukushima. You know, the --  
10 if you think about it, you know, Unit 1 is a GE plant.  
11 Unit 1 is a GE plant and started construction in 1967 and  
12 went operational in '71. That's a very, very old seismic  
13 design that made it through a 9 earthquake.

14 Now, I realize it's what matters at the site.

15 But nonetheless, that, to me, is an actual data point  
16 that even very old seismic designs are rugged and so is  
17 grade cooling pressure behind everything else. You know,  
18 you guys know ASME and the way the code combines the lows  
19 and everything, but nonetheless, I think there is a lot  
20 -- I think that personally there is evidence there is a  
21 lot of robust and seismic.

22 Now, that doesn't mean you shouldn't go to  
23 do that. I'm not saying that. And the tsunami risk was  
24 --

25 CHAIRMAN SHACK: Yes, the ASME Code stuff

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1 doesn't worry me nearly as much --

2 MR. REED: Yes.

3 CHAIRMAN SHACK: -- as something like--

4 MR. REED: That's very, very robust.

5 CHAIRMAN SHACK: -- a switch gear.

6 MR. REED: Yes, I hear you. Yes, yes.

7 CHAIRMAN SHACK: In ASME Code I'm willing to  
8 believe that everybody, you know --

9 MR. REED: Yes.

10 CHAIRMAN SHACK: Basically, you can look at  
11 that one and it's probably going to have the margin, but  
12 there's lots of other stuff that I am kind of counting  
13 on that I'm not nearly as confident.

14 MR. REED: Yes. So I mean that's the way we  
15 have been moving forward on the strategies and the Station  
16 Blackout Mitigating Strategies Rulemaking at this point.  
17 So that's where we are going forward.

18 CHAIRMAN SHACK: You've got design  
19 requirements there in Appendix A.

20 MR. REED: Yes, we do.

21 CHAIRMAN SHACK: Beyond design basis.

22 MR. REED: We will get to that. We can bring  
23 you the outcome.

24 So on Slide 4 then, let me just try to get  
25 through some more background here real quick. I mentioned

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1 that there was an interacting with a lot of other Fukushima  
2 stuff. Our previous direction really stemmed from SECY,  
3 the first SECY the 21-day paper SECY-11-0124 and the SRM  
4 on that.

5 The Commission told us to go and do an ANPR,  
6 at that time, that was in October, I believe, of 2011.  
7 We did that, of course. And then in the meantime, 4.2  
8 turned from a few more sets of equipment and moved away  
9 from the river, so to speak, and give external event  
10 protection to something that, basically, became  
11 Recommendation 4 really in large measure.

12 So that's where we came, we came from that  
13 point in the ANPR. Of course, you put the ANPR out past  
14 -- March 20, 2012 we got over 40 submissions. Of course,  
15 we went through all of that. That did help us, inform  
16 us and come up with this draft regulatory basis that we  
17 now have put out inside five now.

18 And we have started our comment period April  
19 10<sup>th</sup>. That ends in 48 days actually, I believe that is  
20 on May 28<sup>th</sup> and that's in -- you see the docket  
21 NRC-2011-0299.

22 We also plan to hold, like we did on the ANPR  
23 for the station blackout, a Category 3 public meeting.  
24 It will probably be the second or third week, right now  
25 it's not established, in May and that would be to walk

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1 the public through our thoughts in there, so they understand  
2 them better. Then they can provide more informed written  
3 comment in regulations.gov.

4 It would be a similar format. We wouldn't  
5 be there to collect comments, just inform stakeholders  
6 and then they could provide better written comments in  
7 regulations.gov in the docket there. So that's the  
8 background.

9 Now, we can -- if you would like, I can just  
10 get to the basis for rulemaking, which is another actually  
11 pretty noncontroversy, I suspect, basis. We have, of  
12 course, the order. It was issued to all power reactor  
13 licensees and designs. And so that's -- right off the  
14 bat, I think it's pretty clear that we need the new  
15 rulemaking. That order is not in the Federal Regulations  
16 and that alone, I think, justifies rulemaking going  
17 forward.

18 So I think it was an absolute foregone  
19 conclusion we were going to do rulemaking. The second  
20 bullet attempts to point out some of the areas where the  
21 current blackout limits requirements in 50.63 don't address  
22 what we are trying to accomplish with the mitigating  
23 strategies order.

24 And I think your folks are very familiar with  
25 50.63 and what it was trying to do. It wasn't looking

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1 at extreme events that were damaging from beyond design  
2 basis that were damaging on-site and taking out the grid  
3 for a very long time, as we are talking about here.

4 It also would probably take out an SBO  
5 alternate AC power source, because it -- although most  
6 of those weren't required to be designed for showing--  
7 now, some may, in fact, have been, but they weren't required.

8 So it would be likely that it could be adversely affected  
9 by the same event.

10 So of course, the Mitigating Strategies Order  
11 assumes that's all gone. And of course, additionally,  
12 these events affect the entire site. 50.63 was a loss  
13 of off-site power and really two -- I'll call them more  
14 single failures. They were on two diesel generators and  
15 typically with two failures, you get to get to 50.63, loss  
16 of both trains, the on-site emergency power.

17 This is a -- hits the entire site, so you have  
18 got a whole different situation here in trying to mitigate  
19 what could be an awful lot at the same time. And of course,  
20 it goes on indefinitely. And since it goes on  
21 indefinitely, that neatly brings into play spent fuel pool  
22 cooling, which wasn't a concern when we were under much  
23 shorter type of events under 50.63. So spent fuel pool  
24 cooling is obviously in this thing, too.

25 And in addition, the strategies order is

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1 actually required to be -- to work in any mode. And that  
2 was another area where 50.63 did not have that extensive  
3 requirement. 50.63, of course, was a cost-justified  
4 substantial safety enhancement and it was to be  
5 cost-justified and it was, in fact, successful in doing  
6 that.

7 So you can see what the people were trying  
8 to do there. They were trying to get that residual risk  
9 and remove it and have it essentially paid back, if you  
10 will, both indirect and direct cost paid back. And, in  
11 fact, it did and that was shown in NUREG-1776 that it,  
12 in fact, was successful.

13 So a lot of words about say 50.63 doesn't get  
14 the job done. It obviously does or we wouldn't need the  
15 -- even have issued the orders in the first place. So  
16 there is the difference between the orders and the blackout,  
17 you know, requirements we have in place. And that,  
18 obviously, means we need to do something when we bring  
19 in the new mitigating strategies requirements. We have  
20 to recognize those are in place.

21 That takes me -- we will get to that here in  
22 a second. Of course, we are also directed to do rulemaking  
23 by the Commission and that's usually a good thing when  
24 they direct you to do something. You should probably  
25 follow the direction. And we, of course, are doing that.

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1 We were, of course, directed to do that on  
2 an expedited basis. And as you are well-aware, as Mike  
3 mentioned in the very beginning, we have now had, because  
4 of the evolution, once again of the Mitigating Strategies  
5 Order, a very sound basis for revising this rulemaking  
6 process and, you know, allowing the feedback on lessons  
7 learned from the order to inform the rule that's addressed  
8 to the safety issues in a near-term and that allows us  
9 to do a much better process going forward.

10 So that's where we are at on that. And so,  
11 obviously, I think it goes without saying, I don't think  
12 anybody is going to argue, we have a very good basis for  
13 doing rulemaking. We are going to do rulemaking. And  
14 we really took this opportunity, as well as the ANPRs,  
15 and these are opportunities basically to interact with  
16 external stakeholders and clearly this Committee and hear  
17 the feedback and help us come up with something that's  
18 better than what we have so far. And hopefully that is  
19 where we get to.

20 Now, I would also -- just going to Slide 8  
21 now. I mentioned a little bit how the strategies,  
22 mitigating strategies and the 50.63 stuff works together.

23 If you are not really at the -- into the nuts and bolts  
24 of this thing, it may seem like they are two different  
25 things.

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1           They are not, because mitigating strategies  
2 for beyond design basis external events actually are  
3 designed to mitigate an on-site damage state. That is  
4 -- I think of it as a surrogate, if you will, for these.

5           Basically, an infinite number beyond design  
6 basis events you could have and damage states and that  
7 surrogate on-site condition is an extended loss of AC power  
8 and loss of normal access to the ultimate heat sink.

9           So basically, that's a station blackout that  
10 goes on forever and so it's a very -- it's a bounding type  
11 of station blackout, obviously. It's got severe accident  
12 conditions associated, which makes it ever nastier.

13           MR. BOWMAN: And no alternate AC.

14           MR. REED: And no alternate station blackout  
15 AC would be allowed also. So that's the situation.

16           Now, it turns out that if you get in that  
17 situation, as I'm sure a bunch of you folks have been in  
18 control rooms, you get into the EOPs, your station blackout  
19 EOP, that's a symptom-based EOP. And if you were in that  
20 situation, you may not know exactly why you are there.  
21 You know, obviously, it's a symptom. You have no power  
22 on probably your four KV or your motor control centers  
23 at your -- and your AC power, so you are in a station  
24 blackout.

25           So when you can't get off-site power back and

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1 you have sent crews out and you can't recover on-site power,  
2 what do you do? Well, that's -- and you have lost your  
3 station blackout AC power source, if you have one. Well,  
4 that's when you go to the mitigating strategies, that's  
5 what I'll call the response and obtain point and that's  
6 where exactly this stuff is leaking into the EOP.

7           So it works -- it is working very well. At  
8 the implementation level, these things work together really  
9 well. And our intent is to hopefully try to align these  
10 at the regulation level, you know, to the extent that makes  
11 -- we can do that. So that's really all I'm trying to  
12 say up there.

13           We want to make that a smooth transition, so  
14 that the much more probable events, in my view, the norm  
15 -- what I call the sunny day blackouts, LOOP with multiple  
16 failures on-site or some other quirky thing that happens  
17 that you lose AC power, that event -- I want to make sure  
18 that that event could be handled using mitigating  
19 strategies, because it's pretty likely we won't get one  
20 of these beyond design basis external events for any  
21 facility for the history in U.S. And so these are very  
22 remote events.

23           But I think we could -- you know, foreseeably,  
24 we've got a few blackouts lasting at least some short period  
25 of time. So I think that's the --

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1 MR. BOWMAN: A pretty long time.

2 MR. REED: Well, a few minutes. I think of  
3 Dover and I can't put a measure --

4 MR. BOWMAN: It's based on station--

5 MR. REED: Station blackouts, yes. I think  
6 there are some far ones, too, but I'm not a Vogtle recall  
7 on that, but I think those are actually where I personally  
8 believe, just my personal belief, where the biggest bang  
9 for the buck in safety is, because there was a little bit  
10 -- there was a little bit of residual risk, yes, left over  
11 from 50.63 and I think we will be kind of drilling that  
12 into the dust, if you will. I think we will be removing  
13 that for sure.

14 Now, these strategies are really good.  
15 Really any time you get to the point where you don't have  
16 these functions, so -- they are very beneficial for a lot  
17 of situations potentially depending on how this thing is  
18 actually driven into the ground and implementing all the  
19 procedures.

20 So these are very good things to do. I think  
21 they really do provide the best uncertainly. So I'll just  
22 mention a little brief -- a brief thing about Recommendation  
23 7, that naturally fit right into this, because, as you  
24 recall, the Mitigating Strategies Order at the highest  
25 level is about maintaining/restoring core cooling,

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1 maintaining/ restoring containment function and  
2 maintaining/ restoring spent fuel pool cooling  
3 capabilities.

4 And so spent fuel pool cooling is right in  
5 there and it includes the level of instrumentation that  
6 was imposed by EA-12-051. That also actually fits in.  
7 You know, if you can't get operators up to the deck, they  
8 will use that level of instrumentation. That's a thing  
9 that they use in the mitigating strategies. That's the  
10 way they are actually being developed right now.

11 And all those strategies, spent fuel pool  
12 cooling strategies will be worked in through the  
13 implementation guidance, at least that's the way we  
14 currently see this thing working. So it was really right  
15 up into that maintaining/restoring spent fuel pool cooling  
16 at the higher level of the rule.

17 So that works very naturally. And in fact,  
18 I think that what is going on with the mitigating strategies  
19 is superior to what was recommended in the Near-Term Task  
20 Force report in that it is self-powered, portable, it  
21 doesn't rely on on-site AC power, which may, in fact, not  
22 be there, of course, in a blackout.

23 So I would say it's a very good approach.  
24 In fact, we will use spray capabilities that are from the  
25 50.54(hh) (2) requirements that are in place and so that's

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1 all happening right now, too. And so that fits real nicely.

2 That was part of COMSECY 130002.

3 MEMBER STETKAR: Tim or Eric?

4 MR. REED: Yes? Sure.

5 MEMBER STETKAR: One of you guys. And this  
6 is only because I either can't remember or don't read  
7 everything. When you talk about integration with 50.53,  
8 there are a number of plants, I think, that have never  
9 done the station blackout coping analysis because they  
10 justify for whatever reason that their alternate AC power  
11 source could either connect automatically in less than  
12 10 minutes or it could -- I don't remember what the timing  
13 was.

14 MR. REED: I got it.

15 MEMBER STETKAR: But they did some sort of  
16 argument to say we don't need to do a formal coping analysis.  
17 They don't really know how long they can withstand.

18 MEMBER STETKAR: That was the action that they  
19 --

20 MR. REED: Right.

21 MEMBER STETKAR: -- used in AC.

22 MR. REED: And I believe a number of plants  
23 have done it. In fact, we have seen even some new plants  
24 come in and say they don't have to do that.

25 MEMBER STETKAR: I have my work -- member

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1 here, so I try not to line -- Is part of the orders or  
2 part of the rule going to require everyone to do a station  
3 blackout coping analysis?

4 MR. REED: Well --

5 MEMBER STETKAR: Because you are taking out  
6 that alternate AC source.

7 MR. BOWMAN: To a certain extent. What the  
8 licensees have to do in order to satisfy the requirements  
9 of the order is identify the time constraints for the actions  
10 that they need to take using, for the first phase of the  
11 strategies, the installed equipment, then shifting to  
12 portable equipment and then shifting to portable equipment  
13 supplemented by resources and further equipment from  
14 off-site for the final phase.

15 The first phase is close to the type of coping  
16 duration.

17 MR. REED: It's close.

18 MR. BOWMAN: Well, it's close. Matt  
19 McConnell can probably give more details on what was done  
20 for determining the specified durations under 50.63 and  
21 Regulatory Guide 1.155 and what was it, NUMARC-8700.

22 MR. REED: Yes, I don't particularly  
23 care --

24 MR. BOWMAN: What we have got here instead  
25 of the licensee doing thermal hydraulic analyses to see

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1 when they need to initiate the flow, when they need to  
2 supplement the flow from the different source and so on.

3 So instead of having discrete binned coping --

4 MR. REED: Right.

5 MR. BOWMAN: -- periods or specified  
6 durations as you would have gotten under 50.63  
7 determination of the specified durations and there was,  
8 I believe, 2, 4, 8 and 16-hours. Here it is going to be  
9 a spectrum of they know that by 4.11-hours they have to  
10 do a certain thing. And they have got other time gates,  
11 if you will, for events that have to take place in the  
12 progression and we are also requiring them to provide a  
13 basis for a reasonable conclusion to meet those time  
14 constraints.

15 So it is a different analytical basis than  
16 was done for the coping durations for 50.63 and we aren't  
17 going to tell them you have to go back and figure out what  
18 your specified duration under 50.63 would have been if  
19 you had not had an alternate AC source. So I don't know  
20 --

21 MEMBER STETKAR: But the key is all of the  
22 licensees under the orders are doing those analyses.

23 MR. BOWMAN: Yes, yes.

24 MR. REED: Okay.

25 CHAIRMAN SHACK: A different kind of coping

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1 analysis, but it is a coping --

2 MR. REED: And in fact if they had an alternate  
3 AC, it's gone. You know, they can't take --

4 MEMBER STETKAR: That's -- my whole point is  
5 that there are a number who never did those calculations.

6 MR. REED: That's right.

7 MR. BOWMAN: And the other point is that in  
8 the guidance that supports the compliance with the order,  
9 it will be carried forward into the Reg Guide that gets  
10 developed for the rulemaking, it's a requirement for living  
11 knowledge of what your time constraints are. So if you  
12 make future modifications that would change those time  
13 constraints, you have to update what your time constraints  
14 are and have an engineering basis for it.

15 MEMBER STETKAR: Are those analyses being  
16 submitted with or have they been submitted with the plans  
17 that you perceive are --

18 MR. BOWMAN: They are --

19 MEMBER STETKAR: -- because they are integral  
20 to those plans.

21 MR. BOWMAN: They are typically being made  
22 available for audit using electronic reading rooms is how  
23 we have seen them so far.

24 MEMBER STETKAR: Okay.

25 MR. REED: And I like --

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1 MR. BOWMAN: So, yes.

2 MR. REED: I personally -- and this is a very  
3 good question. I like to think of it as a time line and  
4 actions that need to be taken.

5 MR. BOWMAN: Yes.

6 MR. REED: For example, like one or two hours  
7 stripping the batteries.

8 MEMBER STETKAR: No, I was just more  
9 interested in where -- somehow, somewhere during this whole  
10 process from orders through rulemaking --

11 MR. REED: Yes.

12 MEMBER STETKAR: -- people need to do that  
13 type of analysis.

14 MR. REED: Yes. Essentially what they will  
15 have to do though --

16 MEMBER STETKAR: And I wasn't quite clear  
17 where --

18 MR. REED: -- is they will have to show they  
19 can hang in there without any AC power. They become an  
20 indefinite coping facility without that.

21 MEMBER STETKAR: Eventually.

22 MR. REED: And so then the issue is well, why  
23 don't they just throw away their station blackout, you  
24 know, AC power source? And you know, of course, that is  
25 a big -- that's a huge safety enhancement having that thing,

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1 because it -- you know, obviously. So, you know, I don't  
2 think anybody necessarily would do that, but I'm just saying  
3 we recognize that, that there is now a disincentive.

4 I mean, I have just shown I can it with  
5 batteries, why do I need this thing with the upkeep and  
6 it's costing me money, but we recognize that.

7 MEMBER STETKAR: The only reason I bring it  
8 up is we have actually seen some new reactor designs where  
9 we have asked what is your coping period and they say we  
10 don't need to do that analysis --

11 MR. REED: Okay, okay.

12 MEMBER STETKAR: -- because we have installed  
13 these super good alternate AC power sources.

14 MR. REED: Okay.

15 MEMBER STETKAR: So therefore, we don't have  
16 to do that calculation.

17 MR. REED: Yes.

18 MEMBER STETKAR: And they haven't.

19 MR. REED: Yes. I think some of them are 10  
20 minutes, but some of our facilities are more like an hour.

21 Is that right, Matt? Yes.

22 MEMBER STETKAR: Yes, they tend to come in  
23 either 10 minutes or an hour.

24 MR. REED: Yes. Okay?

25 MEMBER STETKAR: Yes, thank you.

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1 MR. REED: Okay. Then that's really all I  
2 wanted to say right now about Recommendation 7. And so  
3 that brings me to -- actually getting into the rule concepts  
4 now starting on Slide 9, which is in the appendix. And  
5 really I just walked through all the different draft  
6 concepts we have in there for the remainder of this thing,  
7 so we can talk about whatever you like to talk about as  
8 we have laid out there with the draft rule concepts.

9 First of all, not too surprising, we are going  
10 to draw up, you know, an applicability statement that this  
11 will apply to power reactor, licenses and design, whether  
12 that is Part 50 or Part 52. And that's consistent with  
13 what we have done so for imposing it on current licensees  
14 as well as Vogtle Units 3 and 4 and VC Summer.

15 VC Summer is actually run by license --  
16 equipment license condition. Vogtle is done by the order.

17 So that's not surprising. I think that -- and it's a  
18 similar thing at the end, too, by -- while implementation  
19 is ensuring that we get this right in terms of the  
20 idiosyncracies of Part 52 and we'll get to that area in  
21 a second.

22 MEMBER SKILLMAN: Tim, before you go further

23 --

24 MR. REED: Yes?

25 MEMBER SKILLMAN: -- most of this information

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1 on the first eight slides points at Part 50 Licenses.

2 MR. REED: Yes.

3 MEMBER SKILLMAN: And you are right in your  
4 regulatory basis document on your page 3, regarding loss  
5 of access to the ultimate heat sink, it should be noted  
6 that the NRC required pass of new reactor designs that  
7 have the atmosphere as the ultimate heat sink to take a  
8 different approach.

9 MR. REED: Yes.

10 MEMBER SKILLMAN: The NRC plans to issue a  
11 proposed rule amending NRC Regulations to address these  
12 scenarios. Are you contemplating a change to Part 52?  
13 Are you contemplating some additional rulemaking? It  
14 seems you are making a distinction between the Part 63  
15 and the -- the Part 50.63 Plans and the 52 Plans.

16 MR. BOWMAN: With the Order EA-12-049, there  
17 were two separate attachments that had the requirements  
18 in them. Attachment 2 had the requirements for the Part  
19 50 currently operating license fee. Attachment 3 had the  
20 requirements for the Vogtle Units 3 and 4, the AP-1000  
21 COL holders.

22 And where we deferred in the wording of the  
23 requirements in this Attachment 3 from Attachment 2, it  
24 wasn't loss of normal access to the ultimate heat sink  
25 that was the requirement, it was loss of normal access

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1 to the normal heat sink, because for the AP-1000 licensee  
2 and I am not an expert on this, so I -- but we do have  
3 the individuals that were involved in writing that  
4 requirement in the room.

5 The phrasing was loss of normal access to the  
6 normal heat sink. That is because the ultimate heat sink  
7 for AP-1000 in that case would be the atmosphere, right,  
8 Eileen?

9 MS. MCKENNA: Yes. And this is Eileen  
10 McKenna from the Office of New Reactors. To answer your  
11 question about the rulemaking, it's the same rulemaking.

12 We need to make sure that in the course of writing this  
13 rule that would apply to the Part 50 licensing and to Part  
14 52 licensing that covers both. And so basically you see  
15 some cases where the language is a little different to  
16 reflect that the passive plant designs, for example, where  
17 their source of -- as Eric was saying ultimate heat sink  
18 is different, but it's not a different rulemaking.

19 MR. REED: I think it was somewhat confusing  
20 the way we wrote that. I think we were really trying to  
21 translate what we did in the orders into the rule and the  
22 working is a little confusing. I think that's where you  
23 were.

24 MEMBER SKILLMAN: Well, let's go back to your  
25 opening comments.

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1 MR. REED: Yes.

2 MEMBER SKILLMAN: You asked this team to take  
3 a look at what you are doing here.

4 MR. REED: Yes.

5 MEMBER SKILLMAN: I would point to that as  
6 an example before you may want to take a look at the  
7 semantics, because it can be confusing.

8 MR. REED: Okay.

9 MEMBER SKILLMAN: So Eileen and Tim, thank  
10 you.

11 MR. REED: Yes.

12 MEMBER SKILLMAN: Got it. Okay.

13 MR. REED: Got it. Okay. Then as I  
14 mentioned earlier, the mitigating strategies is structured  
15 around this on-site damage state and, in that case, an  
16 extended loss of AC power and a loss of normal access to  
17 the ultimate heat sink, as we just mentioned. As you will  
18 see in the draft regulatory basis, we are talking about  
19 just an extended loss of AC power condition.

20 I'll talk about that in a little bit more in  
21 depth in the next slide here, that is the versing functions  
22 for that that drives everything. The development of the  
23 strategies, guidance provided on equipment. I mean, it's  
24 a practical matter, of course, when you have, basically,  
25 an infinite set of things that can be out there. You need

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1 to have something that is defined. A lot of people actually  
2 develop guidance and strategies and design equipment and  
3 put real stuff in place and real plants. And that's what  
4 this thing does, this condition, basically a station  
5 blackout that goes on forever. Now, so that's what is  
6 accomplished.

7 Now, the next slide, Slide 10, is kind of a  
8 bulletized version right out of the Draft Reg Basis where  
9 I tried to hit the highlights of what is in that. What's  
10 in the ELAP and specifically where our thoughts are.

11 You know, this the condition that, first of  
12 all, sends a complete loss of AC power to the essential  
13 non-essential switchgear buses, that's the same as 50.63.

14 It's a loss of off-site power that results to the reactor  
15 tripping concurrent turbine trip, that's the same as 50.63  
16 also.

17 It is unavailability and non-recoverability.

18 Now, we are going beyond of -- on-site most AC power  
19 sources and off-site AC power sources continue and -- of  
20 course beyond. If it was a 50.63 event with some 50.63  
21 -- if it's extended beyond design this external event,  
22 it just goes out. So you can't recover these AC power  
23 sources and you get into this extended condition and that  
24 obviously drives the strategies into a phased approach  
25 and ultimately to a Phase 3 with off-site assistance.

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1           So in addition, if you have on-site  
2 alternative AC power switch, and I think a large percentage,  
3 40 to 50 percent, I think, of the facilities have that.

4           That would be also lost, current assumptions, and so you're  
5 going to have to do this without that. Okay. Somehow  
6 cope with this and basically know that maintain and restore  
7 the core cooling spent fuel for cooling containment  
8 function is without that.

9           So now, you are allowed and this is the same,  
10 this next part is the same as station blackout. They have  
11 AC power available through inverse fed by safety-related  
12 batteries. Now, I'll get to his in a second here. It  
13 is not entirely based on it, but this is the initiating  
14 condition that drives the strategy design.

15           We are intending and hopefully I think we will  
16 probably have quite a bit of comment on that here in a  
17 second. We threw some ideas out there as kind of a snapshot  
18 of what we think might be a good idea. We would like to  
19 put in place perhaps supplemental AC power source  
20 requirements and if that does come to fruition and does  
21 make it, you, of course, would be allowed to use that thing  
22 to restore power.

23           And we will talk about how robust that thing  
24 has to be in order to credit, it is really beyond any blackout  
25 or any one diesel generator right now. I think new reactors

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1 might be able to do it without a whole lot of effort, but  
2 we will see.

3 And then, of course, you can use the portable  
4 mitigating strategies equipment to maintain, that's the  
5 whole point, and restore the functions of the guidance.

6 And so this is kind of the forcing functions. Now, I  
7 mention that because the first thing usually somebody  
8 immediate says is wow, this wasn't Fukushima Unit 1.

9 Fukushima Unit 1, they immediately were  
10 inundated. Well, probably about the second or third  
11 reports wave and they lost everything. And the mitigating  
12 strategies do have contingencies. And so if you lost AC  
13 power and you lost DC power, the strategies themselves  
14 would have -- give you the contingency, I guess, probably  
15 to go, and correct me if I'm wrong here, you know, and  
16 try to do local and manual control the turbine generator  
17 aux feedwater pump, if you're a PWR, assuming you can set  
18 to it and do it. You know, if it's not running --

19 CHAIRMAN SHACK: Well, but 6 assumes you have  
20 the AC power.

21 MR. REED: It's --

22 MR. BOWMAN: 1206 makes that as a baseline  
23 assumption for the baseline set of strategies, but in  
24 Section 3.2.2(13), I believe it is, on page 22, it requires  
25 the capability to use affordable pump as -- to supply the

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1 functions for core cooling or to the steam generator makeup  
2 for core cooling. And it requires permanent connections  
3 be available in order to facilitate that. So are you --

4 MEMBER STETKAR: Except those are low  
5 pressure pumps.

6 MR. BOWMAN: Say again?

7 MEMBER STETKAR: Those are low pressure  
8 pumps.

9 MR. BOWMAN: It's not necessarily low  
10 pressure. Some of them are high pressure pumps.

11 MEMBER STETKAR: Are they?

12 MR. BOWMAN: And they also have permanent  
13 connections and so forth for reactors.

14 CHAIRMAN SHACK: A better answer to John, I  
15 hope, would be if they need a high pressure pump, it will  
16 be a high pressure pump.

17 MR. BOWMAN: Yes, yes. It will be whatever  
18 size pump is needed. And so for the EA-12-049 Mitigating  
19 Strategies if you have lost the internal power distribution  
20 system as an operator, you would manually start either  
21 RCIC or turbine-driver AFW, depending on what system you  
22 have, of course, and take steps to move the portable pumps  
23 and equipment into place in order to continue using those  
24 for core cooling as well as to accomplish the other things  
25 you need to accomplish.

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1 MR. REED: I mean, obviously, in  
2 circumstances your probability of being successful are  
3 dropping, but I just wanted to point out that the  
4 strategies themselves don't have the tendencies as they  
5 give up, that -- you know, obviously, they are sending  
6 you to contingencies.

7 MR. BOWMAN: It's the response not obtained.

8 MR. REED: Yes.

9 MR. BOWMAN: It's to the response not  
10 obtained.

11 MR. REED: So this -- but I think the ELAP  
12 condition is successful in that it drives you to put in  
13 place the guidance strategy to rely upon equipment. It  
14 gives you that additional capability which I think does,  
15 in fact, address uncertainties associated with beyond  
16 design basis internal events which was the whole purpose  
17 of the objective of the order and I think it's the objective  
18 in this rulemaking. So I think if we keep our mind, you  
19 know, focused that that's what we are trying to accomplish,  
20 I think this gets it done. You know, it doesn't save the  
21 world from anything that can happen, obviously. Yes, sir?

22 MEMBER STETKAR: Tim, on this slide, as I read  
23 through this, I get what you are trying to do technically.

24 And then I come to this definition that has -- it's really  
25 convoluted. It has got all of these little points that

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1 you put there. And I start asking myself -- because I  
2 have seen people do this through this whole station blackout  
3 morass over 30 years, attorneys get involved when you issue  
4 a rule.

5 And attorneys look for loopholes. And if I  
6 have a very, very crisp set of very specific conditions,  
7 attorneys will find a condition that says we don't have  
8 to cope with this because the rule didn't say we have to  
9 cope with it. It is -- and I'll give you one.

10 Suppose I have a bunch of cable failures that  
11 disable all of my safety-related power inside the plant,  
12 not externally, but I leave one off-site power bus  
13 energized, but I can't use that for anything. It feeds  
14 a bunch of waste drain pumps some place. That doesn't  
15 satisfy any of your definitions and yet, I'm in a world  
16 of hurt.

17 MR. REED: That's one scenario that --

18 MEMBER STETKAR: That's a scenario. I mean,  
19 but I'm trying to think of other scenarios that really  
20 use --

21 MR. REED: But there is a lot it does work  
22 for.

23 MEMBER STETKAR: But the intent is to be able  
24 to cope with that, that's a blackout.

25 MR. REED: Yes, it would be a blackout.

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1 MEMBER STETKAR: And yet --

2 MR. REED: I would believe --

3 MEMBER STETKAR: -- you know, why -- I  
4 understand you are trying to tie it back to things, but  
5 why not one simple crisp definition that says I don't have  
6 any AC power available that I can use to cool the core  
7 period.

8 MR. REED: Yes, I probably -- I mean, I broke  
9 it out a little. That's exactly what happens here --

10 MEMBER STETKAR: But that's what you are  
11 trying to get at.

12 MR. REED: -- as a result of the first and  
13 not -- and I can't get it back. That's what I would add.  
14 I actually broke it out of the sub-bullets to make it  
15 crystal clear.

16 MEMBER STETKAR: But I mean it's broken out  
17 that way in --

18 MR. REED: Yes, it is there, too. And it is  
19 intended so you know if you are an electrical person or  
20 a designer or somebody outside, you know what I'm taking  
21 away.

22 MEMBER STETKAR: I know what you are trying  
23 to take away.

24 MR. REED: Yes, yes.

25 MEMBER STETKAR: But once it is a rule --

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1 MEMBER BLEY: I kind of --

2 MEMBER STETKAR: -- people will look for  
3 things --

4 MEMBER BLEY: -- like what John said, even  
5 if it were just the first line.

6 MR. REED: Yes.

7 MEMBER BLEY: And then this is a list of  
8 typical things that would get you into that condition.  
9 But that's the condition you are after. That's right.  
10 It's very simple.

11 CHAIRMAN SHACK: Does the first one include,  
12 you know, John's case?

13 MEMBER STETKAR: It says a complete loss to  
14 the essential and nonessential switchgear buses.

15 CHAIRMAN SHACK: All right.

16 MEMBER STETKAR: You know, I had one  
17 nonessential switchgear bus energized, so I didn't have  
18 that. I didn't satisfy that.

19 MR. BOWMAN: Well, the first thing I would  
20 do is have John and his lawyer move on-site.

21 MEMBER BLEY: If only you could.

22 CHAIRMAN SHACK: It's an interesting thing.

23 MEMBER BLEY: That you could --

24 MEMBER STETKAR: It just struck me as being  
25 perhaps over-specified.

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1 MR. REED: Yes, I didn't think of that.

2 MEMBER STETKAR: I mean, as clear as  
3 engineers, we understand what we are trying to get at.

4 MR. REED: I was thinking I was being --

5 MEMBER STETKAR: But in --

6 MR. REED: -- in better communication and  
7 maybe I was, all I can say, allowing lawyers, and I do  
8 agree they are a menace, that they can --

9 MEMBER STETKAR: No, no. It would be okay  
10 if it was in regulatory guidance or something like that.

11 MR. REED: Yes, yes.

12 MEMBER STETKAR: But once it's not --

13 MEMBER BLEY: It's not just that, it's people  
14 trying to meet the rule and define it and then they say  
15 well, we don't meet this condition.

16 MEMBER STETKAR: Yes, I mean, we don't meet  
17 Condition A, B, C.

18 MEMBER BLEY: I can't justify it to anybody  
19 to send money here.

20 MR. REED: I was a licensee, you know, and  
21 sometimes if you can -- you know, you can get down to the  
22 point where no, that's not what is required and it saves  
23 you a lot of money. You know, you might not think, but  
24 there might be somebody above you that is writing the checks  
25 and they do think that, you know? So I hear what you are

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1 saying.

2 MEMBER BLEY: Are you talking about --

3 MR. REED: I mean, that's a definite valid  
4 comment. You know, I didn't think about it that way.  
5 Appreciate that.

6 MEMBER SCHULTZ: In other words, what hasn't  
7 been done, even though the slide is labeled definition,  
8 you really haven't provided the definition.

9 MR. REED: No.

10 MEMBER SCHULTZ: You have had -- the condition  
11 is not well-defined.

12 MR. REED: It's a bunch of bullets.

13 MEMBER SCHULTZ: A lot of assumptions.

14 MR. REED: Right.

15 MEMBER SCHULTZ: And assumptions that should  
16 support the definition of the condition.

17 MR. REED: Right, yes.

18 MEMBER SCHULTZ: Both pieces that John has  
19 indicated.

20 MR. REED: Appreciate that. Thank you.

21 MEMBER SKILLMAN: I want to echo that comment.

22 MEMBER RYAN: The application of the  
23 definition needs some exposition, too.

24 MEMBER SKILLMAN: What you have done is to  
25 pull -- excuse me, I'm sorry.

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1 MR. REED: Well, I was just going to say it's  
2 a very complicated definition --

3 MEMBER RYAN: Yes.

4 MR. REED: -- when you get there, so how do  
5 we use it would be some additional guidance.

6 MEMBER RYAN: Yes.

7 MR. REED: And it would be helpful.

8 MEMBER SKILLMAN: And you have pulled that  
9 definition off of your page 30?

10 MR. REED: Yes, I did.

11 MEMBER SKILLMAN: But there is another  
12 example that's exactly what John is talking about. If  
13 you leave the definition as specific as it is, I agree  
14 with John, it creates this wrestling contest with the  
15 lawyers. And another one is on your page 12. You talk  
16 about alternate AC source means an alternating current  
17 power source that is available to and located and is  
18 connectable, but not connected to.

19 And I would just offer there is good  
20 engineering that would have everything connected, but not  
21 energized. What you have to do is go and put in a link  
22 or put in a breaker. So there are words that matter in  
23 this document.

24 MR. REED: Yes.

25 MEMBER SKILLMAN: And the hard core plant

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1 people actually would read this and say well, my goodness,  
2 I'm fully connected, I'm just not energized. Am I supposed  
3 to disconnect it?

4 MR. REED: Yes. Actually, on page 12 that's  
5 the lawyers from 19 --

6 MEMBER SKILLMAN: Do I have to take it --

7 MR. REED: -- 88 that --

8 MEMBER SKILLMAN: Okay.

9 MR. REED: I mean, that's the current  
10 definition, yes.

11 MEMBER SKILLMAN: So heads up that --

12 MR. REED: Yes.

13 MEMBER SKILLMAN: -- there are words in here  
14 that are very meaningful to plant design people.

15 MR. REED: Yes.

16 MEMBER SKILLMAN: And to very high end plant  
17 design people who say wait a minute.

18 MR. REED: It's a double-edged sword. I  
19 mean, it's nice to have something high level for  
20 understandability, but then it is sometimes having a little  
21 more detail helps somebody engineer it out, you know, and  
22 approach to solve it. So I understand what --

23 MEMBER SKILLMAN: All right. Thank you.

24 MR. REED: -- you are saying.

25 MEMBER SKILLMAN: Thank you.

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1 MR. REED: Thanks. Appreciate it.

2 MEMBER SCHULTZ: We are not saying that high  
3 level would replace?

4 MR. REED: No. Yes, I would try to get the  
5 best of both worlds --

6 MEMBER SCHULTZ: Assumptions, as you put it.

7 MR. REED: -- if I can, you know, yes.

8 MEMBER SKILLMAN: Clarification for  
9 specificity.

10 MR. REED: On page 11, now, this is perhaps  
11 a little more controversial. One thing I'm not doing in  
12 my definition of Draft Reg Basis, and this is really to  
13 put it out there and see what people think, is I'm not  
14 including what was included in the order and that was loss  
15 to normal access to the ultimate heat sink, because I'm  
16 saying essentially that's a consequence.

17 When you have no AC power, then you have no  
18 AC power to any pump that moves water and you have normal  
19 -- you have lost normal access to the ultimate heat sink.

20 Of course, I'm assuming that your ultimate heat sink pumps,  
21 in fact, are designed -- the design basis -- I mean, they  
22 are meeting the design basis of that design.

23 So I'm not saying that is getting destroyed,  
24 if you follow what I'm saying, I'm just saying they stopped.  
25 They don't turn out any more in that moving water.

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1 Typically, that's how you get the most of us putting AP-1000  
2 aside for a second and everybody else, that's how we get  
3 to the ultimate heat sink.

4 And so I have removed that and that's -- it's  
5 put out there really to see what people think about that.

6 And also, I'm interested in what this Committee thinks  
7 about that. And that goes back to the old, you know, hey,  
8 if it's a consequence of the original thing, it's part  
9 of the original thing, you know. Very simple.

10 MR. BOWMAN: And that would be a slight  
11 departure from the order, because the order included it.

12 MR. REED: Yes.

13 MR. BOWMAN: And we recognized that there are  
14 some licensees out there that, for example, have diesel  
15 powered or diesel-driven ultimate heat sink pumps.

16 MEMBER STETKAR: I read through this and I  
17 had some real problems with this, because this presumes  
18 that the ultimate heat sink is a bunch of pumps and pieces  
19 of pipe that move water from Point A to Point B. Point  
20 A being a bucket of water, Point B being the plant.

21 I thought that the intent of the order was to  
22 also address things that would cause the unavailability  
23 of the ultimate heat sink. For example, if I -- my ultimate  
24 heat sink is the bucket. If I poke a big hole in the side  
25 of the bucket and the bucket drains, I could have all of

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1 the pumps in the world and I don't have an ultimate heat  
2 sink.

3 MR. REED: Like a downstream failure.

4 MEMBER STETKAR: Like a dam, for example, or  
5 some other upstream dam even that comes down and takes  
6 it with me or, you know, anything.

7 MR. REED: Washes away. Yes, okay, yes.

8 MEMBER STETKAR: As I read through this, it  
9 sounded like you were trying to address everything in the  
10 notion of unavailability of the ultimate heat sink in the  
11 context of the ability to pump water from Point A to Point  
12 B.

13 MR. REED: I'm restricting it by this. You  
14 are absolutely right, that's why I am --

15 MEMBER STETKAR: And that's what troubled me  
16 a bit.

17 MR. REED: Yes.

18 MEMBER STETKAR: Because there -- it's  
19 obviously a site-specific issue.

20 MR. REED: Yes. I'm saying basically that  
21 ultimate heat sink is designed for the design basis  
22 envelope, similar to a pipe.

23 MEMBER STETKAR: But for example, I'm aware  
24 of plants not in the United States, because I have done  
25 work overseas, who installed big buckets in the ground

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1 in other locations because their normal ultimate heat sink  
2 was vulnerable to some external event.

3 MR. REED: Yes.

4 MEMBER STETKAR: You know, and in this case,  
5 a mitigating factor would be, essentially, all the tank  
6 trucks in the world ought to be available to your site  
7 with a lot of water.

8 MR. REED: Okay.

9 MEMBER STETKAR: If you don't have -- you  
10 know, if you are vulnerable to do that.

11 MR. REED: Here is how I would do that, you  
12 know.

13 MEMBER STETKAR: With a portable pump,  
14 obviously.

15 MR. REED: My two cents. If you were doing  
16 an external events review under 2.1 and you showed that  
17 the ultimate heat sink had disappeared, that would change  
18 that. But we are not assuming the water disappears. I  
19 mean, I think.

20 MEMBER STETKAR: Well, I would just hope--  
21 okay.

22 MR. REED: Right now, I mean, but that's--

23 MR. BOWMAN: Well, there is a provision in  
24 the guidance that for sites where their ultimate heat sink  
25 is perhaps vulnerable to loss due to seismically non-rugged

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1 downstream dam, they have to have work-arounds to get water.

2 But we are -- for other types of situations, we aren't  
3 going to assume that a sink hole opens up and the lake  
4 or river or the oceans goes away.

5 MR. REED: You know --

6 MEMBER STETKAR: From what I hear is that they  
7 are supposed to be addressing that under the order.

8 MR. BOWMAN: For downstream non-seismic  
9 dams, there is a small provision in the order that says  
10 a site needs to address it.

11 CHAIRMAN SHACK: I mean you also have a  
12 separate dam action going on also.

13 MR. BOWMAN: Yes.

14 MR. REED: Yes, we do.

15 CHAIRMAN SHACK: I mean and here, I mean--

16 MEMBER STETKAR: I just wanted to make sure  
17 that once we got into rulemaking, that we weren't missing  
18 somewhere in the whole -- down the line of --

19 MR. REED: No. We are -- we know this. This  
20 is intention.

21 MEMBER STETKAR: It's intentional. Okay.

22 MR. REED: So for example, if I took the new  
23 envelope design -- earthquake whenever it comes out to  
24 be and that fails that downstream dam, then I think the  
25 water has to go away. And if it fails in an upstream and

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1 the dam comes down, then you would have your situation.

2 In other words, as a consequence of the design  
3 basis envelope, this thing is no longer any good. And  
4 if you haven't fixed it, it's gone. You know, but if it  
5 is designed to withstand that, it's there. It's only  
6 electricity loss. Do you see where I'm going? I'm trying  
7 to --

8 MEMBER STETKAR: No, no.

9 MR. REED: -- stay with that concept, because  
10 I think it works better that way.

11 MEMBER STETKAR: Okay.

12 MR. REED: Right or wrong and maybe you think  
13 it's wrong, but that's -- I think that makes more sense.

14 So I wanted to put that out there, because I think some  
15 folks have thought, you know, if they have like a  
16 diesel-driven -- you know, something was not an AC powered  
17 pump and ultimate heat sink, they haven't been able to  
18 credit, I think if it is designed for their ultimate heat  
19 sink in their design basis envelope, that should, in fact,  
20 be allowed. That's a very good feature --

21 MR. BOWMAN: Or if it's not normal --

22 MR. REED: -- for enhancement.

23 MR. BOWMAN: -- access to the ultimate heat  
24 sink --

25 MR. REED: Right. Or not a part of --

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1 MR. BOWMAN: -- or to an alternate access.

2 MR. REED: Yes, exactly, even better.

3 That's, you know, even better.

4 MEMBER STETKAR: Well, I wasn't arguing with,  
5 you know, this part of it.

6 MR. REED: Okay.

7 MEMBER STETKAR: I was just trying to  
8 understand whether the rule was essentially excluding  
9 something that isn't being covered somewhere else.

10 MR. BOWMAN: Well, this is just a suggestion  
11 and we will see based on --

12 MEMBER STETKAR: Yes.

13 MR. BOWMAN: -- particular feedback whether  
14 or not that's the right way to go.

15 MEMBER STETKAR: See what the feedback is.

16 MR. REED: And then we hit -- we already  
17 actually talked about the second bullet and that would  
18 be, you know, AP-1000 Passive Design, so I guess we don't  
19 need to discuss that. They are a very unique situation  
20 where unless somebody sucks away the air, it's -- you have  
21 those ultimate heat sinks, so they -- you know, in the  
22 long-term loss of our access in a normal heat sink can  
23 be a challenge. In the order, of course, in a licensed  
24 condition, it made them do something there, so the system  
25 with the whole thought process for the Mitigating

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1 Strategies Order.

2 So that brings me to Slide 10 and that's an  
3 effort in 10 --

4 CHAIRMAN SHACK: 12.

5 MR. REED: -- or 12, excuse me. I'm burning  
6 out here. It's pretty bad. So the mitigating strategies  
7 on 12 is that -- is again another -- it's bulletized.  
8 Right now, the regulatory basis -- this is fairly similar  
9 to what is in the order. There may be a little bit of  
10 difference here. Development and implement and maintain,  
11 of course, the guidance and strategies and maintain/restore  
12 pool cooling containment, spent fuel pool cooling  
13 capabilities, that's exactly the same.

14 The guidance strategy should be adaptful and  
15 you would be able to use those in any modes, you know,  
16 1 through 6. Again, that's exactly the same as the order.

17 Of course, the equipment has to be designed  
18 to be of sufficient capacity design functionally to do  
19 what it has to and, of course, that is happening also in  
20 the order. That's not a difference. We have already  
21 mentioned the mitigating strategies are building in  
22 contingencies and we would continue that moving forward  
23 hereto.

24 The connection points are also directing you  
25 to take other actions if, in fact, an event becomes more

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1 severe.

2 We are -- now, here is where we are getting  
3 a little different now because we have to deal with what  
4 is already in the draft regulations, so we are going to  
5 integrate those in with the existing 50.63 into the existing  
6 framework and also work in the -- to the EOPs and station  
7 blackout procedures so that aligns. I already mentioned  
8 that.

9 The strategies are required, of course, in  
10 Phase 3 and I think this is probably a phase that almost  
11 everybody has no matter how good your design is to use  
12 off-site assistance and resources, assuming your grid could  
13 go down for a long time. So they will all have Phase 3.

14 And we also include consideration of damage  
15 to the transportation infrastructure. I do believe that  
16 is something that was not in that. I believe the ACRS  
17 suggested that we should consider damage to the  
18 transportation infrastructure in terms of, you know,  
19 support getting to the site. And so that's from these  
20 two regional center, Memphis and Phoenix, I believe is  
21 where they are at. To have that in there, you will see  
22 that.

23 MEMBER SKILLMAN: Tim, let's just --

24 MR. REED: Yes, sir?

25 MEMBER SKILLMAN: -- hold there for a minute.

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1 I've been to many sites in this country, too many sites  
2 in this country and many of them require a bridge to get  
3 through the site. That same bridge is necessary for fuel  
4 for diesel engine, material --

5 MR. REED: Yes.

6 MEMBER SKILLMAN: -- and most importantly  
7 people to come and go. And when we talk about  
8 transportation infrastructure, if we really had a large  
9 earthquake --

10 MR. REED: Yes.

11 MEMBER SKILLMAN: -- it's likely that bridge  
12 is gone. I know one plant prepared for helicoptering fuel  
13 to the EDGs. It seems to me that that next to the last  
14 bullet carries with it permutations and combinations of  
15 logistics that we really have never fully addressed.

16 MR. REED: I agree 100 percent. In fact, we  
17 might want --

18 MEMBER SKILLMAN: And we are looking at them.

19 MR. REED: Yes, we are. In fact, we were both  
20 out at Diablo Canyon and they had this --

21 MR. BOWMAN: They have the non-seismic bridge  
22 that they have been working on its support.

23 MEMBER SKILLMAN: So as you begin to consider  
24 input for this particular bullet, it seems they need to  
25 raise the anti. My own view is that there are some plants

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1 that probably can't survive.

2 MR. REED: Yes.

3 MEMBER SKILLMAN: Fort Calhoun is an example  
4 of one that made its own moat to survive. So I think there  
5 are some issues here that require some very good thinkers  
6 and some very good planners. For TMI, the lead was brought  
7 on the C5A, Rickover turned over his lead and that was  
8 by comparison a mild accident from what we have seen at  
9 Fukushima.

10 MR. REED: Yes, yes.

11 MEMBER SKILLMAN: I have seen other plants  
12 where for security events, you really wondered whether  
13 you could release the staff.

14 MR. REED: Right.

15 MEMBER SKILLMAN: And could you bring in  
16 others without Swat Team protection?

17 MR. REED: Right.

18 MR. BOWMAN: Well, for the integrated plans  
19 that we have seen for EA-12-049, for the most part licensees  
20 have not yet identified the local staging area where the  
21 equipment is supposed to come into from the regional  
22 response centers. And part of what was supposed to be  
23 looking at is how they get the equipment and supplies from  
24 that local staging area to the site to use it. And that  
25 includes a look at the local infrastructure, you know,

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1 considering whether or not the bridges are seismic,  
2 considering whether or not the pathways that they would  
3 need to take would be blocked by debris or subject to  
4 liquefaction.

5 Those are all things we may not wind up looking  
6 at them in the safety evaluation that's covered in the  
7 guidance for NEI 1206, so we will at the very least be  
8 looking at it in the site-specific verifications once they  
9 have developed to the point where they are identified.  
10 This is where the stuff is coming in and this is how I'm  
11 getting it from Point A to Point B.

12 I have heard discussions of potential need  
13 for use of helicopters or small boats as one of the  
14 approaches that I heard from the coastal side.

15 MR. REED: This is a perfect example where  
16 the implementation order really informs the roles in a  
17 substantial way, I think. There is many, of course, of  
18 us, but this is -- you can see how these two work, obviously,  
19 together.

20 I think Diablo Canyon was talking about seven  
21 days or six days.

22 MR. BOWMAN: It's either six or seven days.  
23 I don't recall. I would have to look at their plans.

24 MR. REED: As an island, because of that, we  
25 have to check.

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1 MR. BOWMAN: But they were looking at using  
2 small boats to get in --

3 MR. REED: Yes.

4 MR. BOWMAN: -- to the site.

5 MR. REED: Yes. Well, it's a big deal.

6 MEMBER SKILLMAN: I'll be very curious how  
7 this gets addressed.

8 MR. REED: Yes. And it's interesting  
9 because it is --

10 MEMBER SKILLMAN: It's the rulemaking versus  
11 --

12 MR. REED: -- really kind of off the reactor  
13 site. It's a very tough situation for us to deal with,  
14 related to the space.

15 MEMBER SCHULTZ: Well, that's why this bullet  
16 is here.

17 MEMBER SKILLMAN: Yes.

18 MEMBER SCHULTZ: Because those linkages need  
19 to be evaluated very carefully.

20 MR. REED: Exactly why it's there.

21 MEMBER SKILLMAN: Yes, a good example is  
22 bringing in fuel oil in the middle of a winter storm and  
23 trying to bring tractor trailers on-site to feed the  
24 emergency diesel generator fuel tanks, because sometimes  
25 the logistics even for that mild event are treacherous,

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1 really tricky. I could just imagine a full-blown event  
2 where we are trying to bring in logistics with a broken  
3 infrastructure, such as bridges, railroad trains.

4 MR. REED: Yes, I would think earthquakes are  
5 the ones that bother me the most. But, yes, you could  
6 get into a really severe hurricane-type situation. You  
7 know, sometimes some of these other ones could be --  
8 Hurricane Andrew was pretty nasty around Turkey Point.  
9 Of course, they took preemptive action successfully.

10 The last bullet there just pointing out that  
11 our intent is to make sure we line up with Recommendation  
12 8 and ensure that we are not in crossways and we are efficient  
13 in that regard, so we-- the new set of stuff, the mitigating  
14 strategies and guidance, we would like to be treated inside  
15 of Recommendation 8 along with the SAMGs, the EOPs, EDMGs  
16 in a consistent integrated manner that makes the most  
17 sense. I just point that out that that's what our intent  
18 is.

19 And we are trying to manage that even though  
20 we recognize that those are two different, because we are  
21 actively managing those two to ensure they are aligned  
22 though. So that's all I had on that.

23 Does anybody else have anything they want to  
24 say on Slide 12 there?

25 Design requirements on 13, it's somewhat

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1 overlapping here. We talk about the equipment must be  
2 designed to perform its functions. Of course it does.  
3 That's -- it's kind of redundant with the functional  
4 requirements for the equipment. Tendency here by way on  
5 13 and also on the sub-menu you will see a lot of the same  
6 thoughts in 13 and 14.

7 Now, we want this equipment to be independent  
8 from your installed equipment and the portable equipment  
9 is what I'm talking about, so that it's not taken out by  
10 the event. We want separation. It helps you hopefully  
11 have at least one set of equipment survive.

12 You have -- of course, that means your design  
13 is restored and protected to minimize that common cause  
14 and common mode failure from the non-design that's  
15 installed. In fact, I have heard anecdotal information  
16 that sounds like the industry is coming up with some pretty  
17 interesting ideas on like tornados, for example, and  
18 distances and that. One might -- how far one set is the  
19 from the other and to get some good separation. That's  
20 a good thing.

21 Of course, it's like more --

22 CHAIRMAN SHACK: Of course, it makes life more  
23 difficult to install, but --

24 MR. REED: It does and --

25 CHAIRMAN SHACK: It's a tradeoff there.

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1 MR. REED: -- it can also lead to more time  
2 involved in deploying it and that's another -- and that's  
3 a big -- the time constraints on that and being successful  
4 on this stuff is a real tough one to meet, I think. And  
5 so it's not an easy situation here.

6 You have to reasonably protect that equipment  
7 from, when we call it reasonably protect, design basis  
8 external events and of course that really means that the  
9 design basis envelope and I'll say that right now. But  
10 by having multiple sets and protecting them differently,  
11 I think you get -- you do get an advance here. You do  
12 -- and if you have a good 2.1, external design basis, I  
13 think you get a lot in advance.

14 CHAIRMAN SHACK: And probably the failure  
15 isn't one, then having two helps out.

16 MR. REED: Yes, exactly. It is -- you know,  
17 I think, we just got to be careful you don't run over  
18 promising or intending to be more than we are.

19 Of course then it would be stage -- design  
20 stage deploy to minimize damage internal with the installed  
21 equipment. And this is a pretty tough one. In my personal  
22 view, you know, we are tapping into turbine-driven aux  
23 feedwater. That's a Class 2 system. We have the reactor  
24 coolant pressure event, that's a reactor -- that's an ASME  
25 Code Class 1 system. We could be tapping into

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1 safety-related batteries and to just -- this stuff is all  
2 really important stuff, but, obviously, it is the principal  
3 key to install stuff for the safety function.

4           So the first thing you don't -- you don't want  
5 to kill the patient here. You want to make sure that what  
6 you are hooking in is not destroying what it is hooking  
7 into. Easy to say, not necessarily as easy to do. But  
8 that goes without saying. We need that, at least the design  
9 in accordance with that kind of a thought. We need to  
10 have, of course, enough of this stuff. Enough of it to  
11 accomplish not only the functions across the site  
12 simultaneously, but also have enough additional if you  
13 want to take one set out and you are doing some sort of  
14 testing or something to have assurance of functionality  
15 and availability of that.

16           So that means n plus 1 sets of equipment.  
17 I think that solves that problem. We would have something  
18 in terms of the periodic testing inspection. We have that  
19 in there. And recognizing that there needs to be an  
20 assurance level for that. You can't just buy it and stick  
21 it in still containers and forget about it in 10 years.

22           So there has to be some sort of assurance requirements  
23 on this and recognize because it's beyond design basis,  
24 the special treatment stuff does not apply.

25           So we have to write it in here, otherwise,

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1 it won't exist. And so we recognize that. I'm pretty  
2 sensitive to it from previous experience in doing this  
3 kind of thing. So we will have to put that in there.  
4 And right now --

5 MEMBER BLEY: Have you given some thought to  
6 how you are going to do that?

7 MR. REED: Not a lot.

8 MEMBER BLEY: Okay.

9 MR. REED: Not a lot.

10 MEMBER BLEY: That seems to be, at least in  
11 the regulatory space, a tricky thing to work out.

12 MR. REED: Yes, I would -- my first thought  
13 is kind of where we were going was kind of a stand-alone  
14 50 XXX thing, they would have their own in that one place.

15 MEMBER BLEY: Okay.

16 MR. REED: And not necessarily point to  
17 anything else because it can speak and the quality assurance  
18 stuff won't apply. It's not safe to run side-by-side.

19 MEMBER BLEY: And it's clearly important.  
20 My remembrance is right after Fukushima when you went out  
21 and did the survey --

22 MR. REED: Yes.

23 MEMBER BLEY: -- of the --

24 MR. REED: For the 50.55.

25 MEMBER BLEY: -- 55(b) stuff, yes. A lot of

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1 it wasn't maintained the way --

2 MR. REED: That's right.

3 MEMBER BLEY: -- you had expected or anybody  
4 had expected.

5 MR. REED: That's right. This is a lesson  
6 learned from that. And so we need to make sure that gets  
7 done up to a level of assurance that makes sense. I mean,  
8 this is -- you know, you don't want to put a whole lot  
9 of -- a heck of a lot of, you know, focus and resources  
10 in it.

11 MEMBER BLEY: But you don't want it to be  
12 powered to support other equipment.

13 MR. REED: Yes, I wouldn't want them to stop  
14 doing stuff on aux feedwater, you know, for this, you know.

15 That's 100 times more important. You know, that's the  
16 idea, but we can't just have the thing sitting there for  
17 10 years and rusting away, you know, or get washed away  
18 in the flood, you know. So that's the idea.

19 And some sort of -- you know, right now, some  
20 of this equipment will be used a little differently, I'm  
21 getting to the last bullet, where, you know, you might  
22 be using a 1E battery that was designed for a LOCA, you  
23 know, it's a very fast bringing down and now you're using  
24 it for this very long thing. So there might be -- you  
25 might need something there to have some assurance that

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1 the way you are using this makes sense and will function  
2 for the time you are crediting it for.

3 And that goes to the underlying analysis that  
4 is supporting this. You know, it's not just thermal  
5 hydraulics. It's also, you know, batteries and that kind  
6 of thing.

7 MEMBER BLEY: You probably need some kind of,  
8 at least for some of the equipment, maybe batteries or  
9 there needs to be some test requirements.

10 MR. REED: Yes, I think there is going to have  
11 to be something and I'm not -- I don't know, do you want  
12 to say anything about that, Matt? That's Matt. He is  
13 our battery guy.

14 MEMBER BLEY: Yes, I would like to hear about  
15 that, because --

16 MR. REED: It's actually --

17 MEMBER BLEY: -- every time you use them, it's  
18 the way you -- you get a trip.

19 MR. REED: -- the power source is batteries,  
20 you know, for quite a while.

21 MR. McCONNELL: My name is Matt McConnell.  
22 I'm with the Electrical Engineering Branch at NRR and  
23 part of the team for this rulemaking effort and the  
24 mitigating strategies.

25 One of the issues we are running across with

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1 the batteries is with the implementation plans or  
2 integration plans that the licensee has submitted. They  
3 are crediting the batteries that are existing, the Class  
4 1A batteries, vented lead acid batteries, for essentially  
5 being able to use up to 72 hours.

6 And our recollection, albeit the information  
7 we have and my experience with batteries and the  
8 qualification plans and the qualification procedures that  
9 are developed by industry standards, really are only  
10 demonstrated up until about eight hours for the type of  
11 batteries that we are using.

12 So one of the questions that we are proposing  
13 to industry and one of the items, I believe, that we  
14 mentioned at a public meeting last week was this exact  
15 concern, because we do not want the licensees to be trying  
16 to credit for extended durations without demonstrating  
17 to us that the technology can actually form that.

18 And one of the things that we are looking at  
19 testing is one aspect, but, you know, at what interval?

20 How long do we have assurance that these batteries, you  
21 know, if you just perform a calculation, can perform their  
22 function?

23 And I think we have a lot of questions that  
24 are unanswered, at this point. And we are going to work  
25 with industry to see what they have done on their side

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1 and if they have documentation with the manufacturers given  
2 the technology restraints as we see them.

3 MEMBER BLEY: Have you looked around at other  
4 industries that might be using similar batteries in the  
5 kind of mode we are talking about here to see if there  
6 is experience that you can draw upon?

7 MR. McCONNELL: Right now, we are looking at  
8 everything, but I mean, I haven't heard anything, at this  
9 point, to where these type of batteries will be in that  
10 type of application with a low draw. There are newer  
11 technologies that use slight variations of what we are  
12 using, but they are not exact replicas.

13 In addition, we are actually performing and  
14 as I mentioned in December, the Office of Research is  
15 performing testing right now on the technologies that we  
16 are using in the nuclear power plants for the type of  
17 durations that they are proposing.

18 Now, that's only going to really provide us  
19 with a snapshot in time. It does not give us assurance  
20 that for the life of that battery that that -- that it  
21 can perform that function. It just says with the battery  
22 in its current state, it's current condition, it was able  
23 to supply this function. And that's a challenge that we  
24 have going forward.

25 We are looking back at our guidance for

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1 qualification, which is the Institute of Electrical  
2 Electronics Engineers 535, which is used for qualifying  
3 safety-related batteries and seeing if we can extrapolate  
4 some of the data or maybe we will have to work with industry  
5 and maybe manufacturers to see if there are any kind of  
6 similarities with things that have been done before and  
7 things that we can potentially credit to allow them that  
8 benefit to draw out the batteries over a longer duration  
9 instead of using this quick draw with -- at a higher current.

10 MEMBER BLEY: Thank you.

11 CHAIRMAN SHACK: How much review are you  
12 giving of the operator actions that are going to be required  
13 to get this stuff in place? I mean, do you go through  
14 a formal HRA analysis? Are people submitting plans showing  
15 that they really thought about this?

16 MR. BOWMAN: At this point, we don't have a  
17 well-developed set of procedures yet, so it wouldn't be  
18 practical to do the HRAs. I think I had mentioned before  
19 or was that at a different meeting? There are some issues  
20 with a company doing an HRA for an event when you don't  
21 have the constraints -- the conditions that have to be  
22 in.

23 If there is -- in the ongoing 2.1 reevaluations  
24 for flooding, there is the Interim Staff Guidance that  
25 has come out for the integrated assessments and that's

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1 JOB-ISG-2012-05 that includes human reliability analysis  
2 in the PRA to look at will the mitigating strategies, as  
3 they are written, be feasible to combat a flood at a  
4 specified height?

5 But what we are looking at is the establishment  
6 the time constraints are for the actions to have taken  
7 place. There is the separate action that is ongoing under  
8 the 50.54(f) letters for the Recommendation 9.3 staffing  
9 analyses and we are looking at the interaction of all this  
10 and establishing a basis for the reasonable conclusion  
11 that the time constraints could be met.

12 So we aren't doing a full blown HRA, but we  
13 are looking to see do we have a reason to believe that  
14 they have enough operators. The operators are  
15 well-trained enough and will be capable of doing the  
16 procedures as they are set out.

17 MEMBER BLEY: This is an area where I would  
18 expect to see some cooperation between yourselves and INPO  
19 or others. Is there -- they do a lot of work supporting  
20 operations in the plants. And it would seem that that  
21 ought to be going on. I don't know if it is or not.

22 MR. REED: I'll just say I know from a little  
23 bit I have seen and, frankly, I could be wrong, but I know  
24 there is an effort to try to make this stuff very easy  
25 to do. You know, in terms of, you know, you don't know

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1 who on your staff is going to be available or who is going  
2 to be left and what manpower you are going to have.

3 So you want to make it easy to use people to  
4 go get this stuff, get it from where it is, move it to  
5 where it needs to be and hook it up. So, you know, the  
6 plugs and color coding and so that kind of stuff, that's  
7 not necessarily what I'm talking about here. But it's  
8 the human factors.

9 MEMBER BLEY: Part of it.

10 MR. REED: Yes.

11 MEMBER BLEY: Yes.

12 MR. BOWMAN: Yes.

13 MR. REED: Yes, it's a little bit. You know,  
14 it's not human reliability analysis, but that's happening.  
15 I have seen that, you know.

16 MR. BOWMAN: Oh, yes, and we included  
17 discussions and markings, portable lighting and so forth  
18 --

19 MR. REED: Yes.

20 MR. BOWMAN: -- for accessibility and  
21 feasibility of performing the operations. Right now,  
22 where we are with the development of the guidance and the  
23 strategies, it's not really far enough along. What we  
24 are reviewing now is the plans to develop them. Where  
25 we see things like licensees saying in the integrated plan

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1 that they will accomplish their load stripping in a very  
2 short period of time. We will ask questions regarding  
3 that, like what sort of marking will you have on the breakers  
4 that are supposed to be opened in order to facilitate it  
5 and things like that.

6 We aren't, at this point, looking at doing  
7 an HRA on that. And very likely, this is going to wind  
8 up being a more focused review during the on-site  
9 verification inspections. As with the B.5.b effort, we  
10 will see the folks supporting that from the regional offices  
11 like the senior reactor analysts and the operations  
12 examiners and so forth the Federal Outage Regional Aids  
13 and Supporters.

14 MEMBER BLEY: Are you thinking about  
15 associated adverse environments that this might have to  
16 be done under? Simple is good and on a nice clear day  
17 in this room. It's real easy.

18 MR. BOWMAN: Yes.

19 MEMBER BLEY: You know, so many of the  
20 scenarios that get us into a blackout kind of scenario  
21 include some significant fires perhaps or explosions around  
22 the site.

23 MR. BOWMAN: Yes.

24 MEMBER BLEY: It can put you in a pretty tough  
25 spot. And I guess I would encourage people to keep going

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1 back and looking at those photographs we saw from Fukushima  
2 of some of the work people had to do and the conditions  
3 they were trying to work against.

4 MEMBER ARMIJO: And lighting.

5 MEMBER BLEY: Lighting was low.  
6 Temperature, all sorts of things.

7 MEMBER RAY: Let me ask a related question.

8 Is there some place that I have missed where we have clearly  
9 indicated why it is only AC power that is presumed to have  
10 an extended loss? I mean, if you are talking about  
11 flooding, for example, it only affects AC power for some  
12 reason?

13 MR. BOWMAN: Well, again, that goes back to  
14 the need under the order for contingencies for the loss  
15 of all internal power distribution. So we have to have  
16 a baseline set of capabilities that are left for the  
17 licensees to perform their analysis to develop what the  
18 time constraints are.

19 You've got to start from somewhere, but then  
20 we have the contingencies for -- we do have a requirement  
21 for them to be able to go out and manually start RCIC or  
22 turbine-driven AFW or whatever their emergency cooling  
23 system is, which would presume the loss of DC power to  
24 start that.

25 MEMBER RAY: Thank you.

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1 MR. REED: Yes, that's -- it's interesting  
2 because I'm just thinking real-time here and there is --  
3 in the U.S. I don't know if there is too many fast floods  
4 that can take out everything without you taking any action  
5 at all, even near guide dam failures.

6 Now, a tsunami, obviously, that happened at  
7 Fukushima.

8 MEMBER RAY: That's pretty fast.

9 MR. REED: Yes, that was. And I'm thinking,  
10 you know, most of our floods are slow.

11 MEMBER STETKAR: Well, I --

12 MR. REED: We have a long, long time--

13 MEMBER STETKAR: If you've ever been in an  
14 earthquake, they are pretty fast.

15 MR. REED: Well, I mean, you know, even there  
16 I think most I have heard it's still giving you hours.

17 MEMBER STETKAR: It depends on what is broken,  
18 at least.

19 MEMBER RAY: Well, there must be some  
20 fundamental reason why we treat AC differently than DC.

21 I'm just trying to understand what it is, because it talked  
22 about the battery and what we can rely on there and so  
23 on, but, you know, I have an intuitive sense that well,  
24 DC is more rugged and less vulnerable. But I'm not sure  
25 I really understand.

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1 MR. REED: I agree. Actually, I think a  
2 diesel generator -- yes, I hear what you are saying.

3 MR. BOWMAN: The way I would look at it is  
4 loss of certain AC power sources is a natural consequence  
5 of loss of off-site power and a turbine trip, but such  
6 a thing which is more probable than some of these types  
7 of events that we are considering wouldn't necessarily  
8 have the same effect on a station battery.

9 MEMBER RAY: Well, not necessarily. But let  
10 me tell you, I have run a plant and I had a lot more sources  
11 of AC power than I did DC.

12 MR. REED: Yes.

13 MEMBER RAY: And so I'm just not really clear  
14 on what leads us to this ELAP as the thing we are so focused  
15 on.

16 MR. REED: Well, that --

17 MR. McCONNELL: This is Matt McConnell again.

18 I think one of the key items is batteries being a passive  
19 feature. I think that it doesn't require a start signal.

20 It's there. It's generally there. Once you lose a  
21 battery charger, it is there. And the same thing with  
22 the inverters and everything that are associated with it,  
23 that equipment is there. It does not require any specific  
24 signals or actions or an activity to actually perform its  
25 function.

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1 MEMBER RAY: Well, it has to be connected to  
2 whatever it is you are using it for.

3 MR. McCONNELL: It's permanently connected.  
4 The actual Class 20 batteries are permanently connected  
5 in. They are typically floated on the system with the  
6 battery chargers. So once the battery charger is lost,  
7 which it is always assumed to be lost because of the  
8 situation, the batteries are there and they are designed  
9 -- they are put into, when applicable actually in all cases,  
10 seismically- qualified racks that are very robust.

11 MEMBER RAY: Yes, but we are talking about  
12 a flooding event, I think. In any event, if the battery  
13 can only be used for what it is normally connected to,  
14 and as you say floated on, and that's the rule, then I  
15 maybe have a little better appreciation for it. But I'm  
16 not sure that that's baked in here anywhere.

17 MR. McCONNELL: Well, I was just trying to  
18 address the situation where why in the past were station  
19 blackouts, why it was assumed to be available and why the  
20 AC for the inverters was assumed to be --

21 MEMBER RAY: Yes, I understand, but I mean,  
22 we are going through all of this primarily, not exclusively  
23 --

24 MR. McCONNELL: Yes.

25 MEMBER RAY: -- because of a flooding event.

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MR. McCONNELL: Absolutely.

MEMBER RAY: And I just -- from my own experience, I'm not that confident in being able to continue power after a flood from a DC source any more than an AC source. But anyway, that's enough on that.

MEMBER ARMIJO: If the batteries at Fukushima had been located the same place where that diesel generators were in the basements, would you still make that same assumption?

MR. McCONNELL: The batteries were in the water.

MEMBER ARMIJO: They were under water and they still functioned to a certain extent?

MEMBER STETKAR: No.

MR. McCONNELL: I don't think they --

MEMBER STETKAR: No, no, they didn't.

MEMBER ARMIJO: So it depends on the location?

MR. McCONNELL: Yes.

MEMBER STETKAR: Yes.

MEMBER ARMIJO: And the ruggedness. Regardless of what you say, battery racks are really rugged. The things they are connected to aren't as rugged as the battery racks. They are permanently connected to stuff that is in cabinets. The cabinets are anchored to floors

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1 and they are located in the building at some elevation.

2 MR. REED: Yes.

3 MEMBER ARMIJO: That is subject to either  
4 seismic acceleration or fires or flooding or whatever you  
5 want to roll at it.

6 MR. REED: Yes.

7 MEMBER ARMIJO: So the batteries may survive  
8 very well, but you can't shoot the gap with the electrons,  
9 because it's not there. So, you know, there are events  
10 that will take away battery supplies. Not necessarily  
11 because of the battery.

12 MEMBER BLEY: If you have ever seen a battery  
13 room after an explosion, they're gone.

14 MEMBER STETKAR: Yes, well, that's one.

15 MEMBER ARMIJO: So we get back to portable  
16 equipment.

17 MEMBER STETKAR: But that's the whole key is  
18 they were saying that the second level, I thought that  
19 what Eric was saying is that, contingencies are supposed  
20 to look at that.

21 MR. REED: Right, yes.

22 MEMBER STETKAR: They are supposed to --

23 MR. REED: It's there.

24 MEMBER STETKAR: -- have that --

25 MR. REED: The direction is --

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1 MEMBER STETKAR: -- capability.

2 MR. REED: Exactly. I'm not saying you are  
3 going to be successful, but you will have a fighting chance.

4 MR. BOWMAN: And you know, you have it there,  
5 you know it's there, you know, you are familiar with it.

6 MR. REED: Yes.

7 MR. BOWMAN: And know where the connection  
8 is that you've got to go hook up.

9 MR. REED: If you're going to be successful,  
10 it depends on how long you have.

11 MEMBER STETKAR: While we're talking about  
12 this, as long as we are off -- are we off DC for a minute?

13 MEMBER ARMIJO: I am. I'm off, but I have  
14 a question on portable equipment.

15 MEMBER BLEY: Well, just one last thing on  
16 DC. Have you heard of anybody looking at bringing in  
17 portable supplies of direct current?

18 PARTICIPANT: Car batteries.

19 MEMBER BLEY: You can do that for an  
20 instrument or two.

21 PARTICIPANT: You aren't going to go much  
22 further than that.

23 MR. BOWMAN: Frankly, yes, there are elements  
24 where that happens. One of the other requirements in --  
25 or specifications in NEI-1206 in Section 5.3.3, it is first

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1 made of -- it deals with seismic effects on instrumentation  
2 and the need for the development of resource for licensees  
3 to be able to use to get instrument readings using portable  
4 test equipment like flukes that could apply a DC current  
5 or whatever the appropriate power source for the  
6 instrumentation is.

7           There are other places where we have seen the  
8 use of portable DC power supplies. I haven't gone through  
9 all the details of all the integrated plans yet, so I  
10 couldn't tell you for sure whether or not any have been  
11 proposed here, but we have seen it.

12           MEMBER STETKAR: Quite a ton.

13           MR. BOWMAN: Yes.

14           MEMBER ARMIJO: I had a question on the  
15 portable equipment, since it is so important, in the bullet  
16 there you have "would need to be protected from the effects  
17 of beyond design basis external events." Could you amplify  
18 what the staff's thinking is regarding what would be the  
19 adequate protection for this last ditch equipment?

20           MR. REED: It would be the design basis.

21           MEMBER ARMIJO: See, that's the thing that  
22 gets me.

23           MR. REED: It's still a regulatory basis.  
24 I'm going to have to have an asterisk or a footnote or  
25 a new review that's beyond, yes.

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1 MEMBER ARMIJO: So it just seems that if  
2 that's the last thing you have got and this --

3 MR. REED: Well, you know --

4 MEMBER ARMIJO: -- event took out all this  
5 other stuff --

6 MR. REED: -- keep in mind, you know --

7 MEMBER ARMIJO: -- this stuff --

8 MR. REED: -- it's great for that stuff to  
9 survive, but if there is nothing left for it to hook into,  
10 it doesn't make sense. So we have to -- even though --  
11 you know, you have to have other stuff. You have to have  
12 a distribution system either through water or through  
13 electricity. So, yes, I do understand what you are saying,  
14 but there has to be enough --

15 CHAIRMAN SHACK: The pipes are going to be  
16 there, you know.

17 PARTICIPANT: The pipes are going to be there.

18 CHAIRMAN SHACK: I'm fairly confident of  
19 that, but it's the rest of it that I'm --

20 MR. REED: I think you are right.

21 MEMBER ARMIJO: You would put the building  
22 where you store this stuff at the highest point --

23 MR. REED: But the tests --

24 MEMBER ARMIJO: -- way beyond your --

25 MR. REED: -- may be gone, you know.

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1 MEMBER ARMIJO: But for example in a building

2 --

3 MR. REED: Yes.

4 MEMBER ARMIJO: -- it's seismic.

5 MR. REED: Yes.

6 CHAIRMAN SHACK: Well, I would like somebody  
7 to look at that turbine-driven pump.

8 MEMBER RAY: It's tough to make it operate  
9 on a good day, much less --

10 CHAIRMAN SHACK: Yes.

11 MR. REED: More trouble with that, yes.

12 MEMBER ARMIJO: But so you wouldn't require  
13 something --

14 MR. REED: Beyond?

15 MEMBER ARMIJO: -- different? Seismic  
16 isolation of the building where this equipment is stored,  
17 you know, that's pretty straightforward stuff.

18 MR. REED: Well, I mean, I'm not --

19 MR. BOWMAN: Well, what we have got set forth,  
20 there are a variety of options for the storage. Depending  
21 on the site-specifics, we have in the guidance  
22 specification that they need to consider interactions with  
23 the portable equipment with anything else that is in the  
24 building and as well as strapping the equipment down, so  
25 it won't fly around. So even though it is portable, it

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1 won't flip over.

2 CHAIRMAN SHACK: Sure, tie-downs and stuff  
3 like that.

4 MR. BOWMAN: Yes. Those are the kinds of  
5 things that we have got.

6 MR. REED: Our people right now -- if you see  
7 on our part, we have seen people treating different sets  
8 differently. Like have one set open, basically, with  
9 nothing to fall on it. You know, for example, if it's  
10 a seismic thing, another one has --

11 MR. BOWMAN: At this point for the most part,  
12 people have not determined how they are providing the  
13 protection to the equipment there.

14 MR. REED: Treating them differently,  
15 different sets can get to the same on that, but we have  
16 to get a little bit more.

17 MEMBER ARMIJO: But you haven't really  
18 thought through what would be adequate?

19 MR. REED: Not --

20 MEMBER SCHULTZ: Eric, where you are going  
21 now leads -- I think the answer to my question and that  
22 is it's very general with this slide, but -- and it may  
23 just be word selection, but it's labeled design  
24 requirements. And when I look down the list, I see these  
25 more as objectives. In other words --

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1 MEMBER ARMIJO: Yes.

2 MEMBER SCHULTZ: -- to minimize common mode  
3 and common cause failures. It's a good objective, but  
4 then --

5 MR. REED: Yes.

6 MEMBER SCHULTZ: -- you need to develop the  
7 requirement, which would be quantified and specific.

8 MR. REED: Should call them design concepts  
9 here, yes.

10 PARTICIPANT: The objectives is good.

11 MR. REED: Objectives, yes.

12 MEMBER SCHULTZ: But I think that's  
13 important. And what used -- where we're leaning toward  
14 Eric is that that's what the mitigating strategies is in  
15 the process of defining. Thank you.

16 MEMBER SKILLMAN: I think there are a couple  
17 of other items that need to be on this list. One is the  
18 concept of the surveillance and care and feeding of the  
19 device, so it's fit for duty when you choose to use it.  
20 That means, PMs, the location, testing, grounding, that  
21 type of thing.

22 Something you haven't spoken about is actually  
23 rehearsing, actually doing it, actually saying hey, we  
24 are going to assume that we have got a casualty and pick  
25 a plant, pick Waterford 3, and you are going to move stuff

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1 from Memphis. It seems like there need to be drills that  
2 the industry supports, that the executives support where  
3 you actually do a mock run and move equipment from the  
4 flex storage location to a plant, pick a region, where  
5 the leadership says we are willing to do this and you  
6 actually hook it up and you actually demonstrate it does  
7 what it is supposed to do.

8 MR. BOWMAN: There actually is a plant  
9 deployment from a regional response center for next year.

10 They haven't selected the site that they are deploying  
11 the equipment to. They will bring the equipment in and  
12 move it around. They are not going to be hooking it into  
13 primary systems and pumping water in, however, but they  
14 will run the equipment to be sure it works. So that is  
15 already in the works.

16 And my understanding is that the contractual  
17 relationship they have set up with the regional response  
18 center is going to have that happen periodically for the  
19 drills and exercises on a site level. It is a requirement  
20 of the order to do them periodically in any event, it's  
21 specified every eight years, so that it lines up with the  
22 exercise and drill cycle that is already in place for the  
23 Appendix E exercises.

24 MEMBER SKILLMAN: Will the plant tech specs  
25 be changed to recognize this equipment?

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1 MR. BOWMAN: I don't think they are going to  
2 wind up in technical specifications. I wouldn't expect  
3 them to. They are doing a stand-alone maintenance system.

4 We have got some words describing what the maintenance  
5 system should have for characteristics in Section 11 of  
6 AI-1206 and EPRI is currently putting together the basis  
7 for it.

8 There is also a specification in the Section  
9 11 of 1206 that the licensees have to have an established  
10 basis document for the maintenance items that they select  
11 as well as the testing and surveillances that they will  
12 be doing on the equipment. And they are also looking  
13 towards the INPO AP-913 process for the maintenance of  
14 the equipment.

15 MEMBER SKILLMAN: So just hold that thought  
16 for a minute and just assume that you are the shift manager  
17 and today is the day the equipment arrives from Memphis  
18 and they are going to hook it up to your plant. So you  
19 are doing a very detailed review in your tech specs to  
20 find out what can go wrong and where you are allowed to  
21 be.

22 What is going to be the governing document  
23 that says it is okay to hook this thing up to your plant?

24 MR. BOWMAN: Well, as I already mentioned,  
25 they will not be hooking it up to primary systems, because

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1 we need to keep it independent from the safety-related  
2 systems. The only time you will actually see it hooked  
3 up is perhaps either following an event that requires its  
4 use or maybe in the pre- operational testing for a new  
5 reactor.

6 MEMBER SKILLMAN: So how do you know it works?

7 How do you know it works?

8 MR. BOWMAN: You look at the basis document,  
9 the application analysis that has been done and you do  
10 independent testing of it.

11 MR. REED: The tests that stand-alone, not  
12 hooked in.

13 MR. BOWMAN: Yes.

14 MR. REED: Yes, there is a little jump there,  
15 if I recall.

16 MEMBER SKILLMAN: There is a jump.

17 MR. REED: Yes.

18 MEMBER SKILLMAN: It's a huge jump. Is the  
19 pipe stub truly open or is it a blank that has a hole in  
20 the end of it and there is a plug up there and you can't  
21 see.

22 MR. REED: Yes.

23 MR. BOWMAN: And for the pipe stub that you  
24 have the question about, where the modification has been  
25 done to the safety-related structure system with a point

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1 of putting the connection there, presumably the quality  
2 assurance program for the SSE will include the  
3 post-installation testing that would show that there isn't  
4 a plug there.

5 MR. REED: For the connection, yes.

6 MR. BOWMAN: Yes.

7 MR. REED: That's definitely secured.

8 MR. BOWMAN: And once you get away from the  
9 special treatment portions, then it is not connected and  
10 you can do an actual running test of it.

11 MEMBER SKILLMAN: Okay. Thank you.

12 MEMBER STETKAR: Don't leave this yet. The  
13 last two bullets there or the last bullet, in particular,  
14 does that also apply to Memphis and Phoenix?

15 MR. BOWMAN: Yes.

16 MEMBER STETKAR: Okay. Thank you.

17 MR. BOWMAN: They will have their  
18 separate --

19 MEMBER STETKAR: Yes is good enough.

20 MR. BOWMAN: And the other piece, the  
21 contractual relationship between the regional response  
22 centers and the utilities includes a capability for the  
23 NRC staff to make unannounced visits and inspections.

24 MEMBER STETKAR: Okay.

25 MR. BOWMAN: So that we do get oversight of

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1 those two facilities.

2 MEMBER STETKAR: Thank you.

3 MR. BOWMAN: And it may include satellite  
4 facilities besides the ones in Memphis and Phoenix.

5 MEMBER STETKAR: All right.

6 MR. BOWMAN: For the larger pieces of  
7 equipment.

8 MEMBER STETKAR: Getting back to the HRA, that  
9 you like to call it, you said as part of the plans people  
10 need to do, what I call, a coping, an effective coping  
11 study. And they need to address second-level  
12 contingencies like no DC power available.

13 You said well, it's not feasible to do an HRA  
14 because people don't want to do HRAs because they don't  
15 have procedures and all of that kind of stuff. Okay.  
16 I'll give you that.

17 We don't need to quantify how likely it is  
18 that people fail. Are people required, probably too strong  
19 a word, or expected to do feasibility analyses with time  
20 lines, estimates of personnel availability, estimates of  
21 actual walk-through times with margins, so you count from  
22 certain feet and show those to you in support of these  
23 plans.

24 MR. BOWMAN: They are doing that in response  
25 to the 9.3 recommendation. We have been working with --

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1 MEMBER STETKAR: No, no, that's not 9.3.  
2 It's part of this. 9.3 is emergency planning.

3 MR. BOWMAN: The emergency planning fellow  
4 is doing the 50.54(f) review of the staffing analyses  
5 included the staffing analysis for the order EA-12-049  
6 and they are supporting us as part of the development of  
7 the strategies and guidance. Industry is putting together  
8 guidelines that NSIR is going to be taking a look at in  
9 order to go to satisfy the other aspects of the 9.3 Tier  
10 2 portions on exercises and training for multi-unit events  
11 or site-wide events.

12 MEMBER STETKAR: I'll take that as a  
13 long --

14 MR. BOWMAN: Which --

15 MEMBER STETKAR: -- no. Thanks. Now, what  
16 I'm talking about, we will get back to what Harold is talking  
17 about, is as a second-level contingency, you have already  
18 said that I have to be able to deal with no DC power.  
19 It's contingency. There should be a plan in place to do  
20 that. Certain people need to do certain amounts of things  
21 and a certain amount of time to deal with that.

22 You can do a feasibility study without having  
23 procedures in place. I'll point you to, write this down,  
24 NUREG-1921 Section 4.3. It's a joint EPRI, an NRC  
25 research report, that tells you it's in the context of

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1 fires and people like to say well, this is a fire and we  
2 are not dealing with a fire. But it gives you really good  
3 guidelines about how to do a feasibility study under  
4 conditions where you don't have any procedures, because  
5 these are for fires.

6 And it strikes me that as part of these plans  
7 that people are submitting, they ought to be doing at least  
8 that level to give you, as a reviewer, some assurance that,  
9 indeed, they can do it. Everybody always has enough  
10 people. They are always trained better than everybody  
11 else. And they can always get from Point A to Point B  
12 in the minimum amount of time possible.

13 I have never seen a plant that says they  
14 couldn't do all of those things, until they actually tried  
15 to do it. And that's focused on these actions. It's not  
16 in the whole context of the emergency planning under, you  
17 know, site-wide emergencies and sure I've got  
18 communications and staffing. It's part of that, but this  
19 is much more focused on these particular mitigating  
20 strategies for these events focusing on, you know, the  
21 people you have available.

22 MR. REED: Correct me if I'm wrong, but I think  
23 right now we are looking at, in terms of the staffing for  
24 the mitigating strategies, part of the staffing that the  
25 eight pages take are on-site, having enough crews and

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1 probably you are going to need, you know, enough operators,  
2 too, to go out to these sets and then deploy them all to  
3 all the places they need to be deployed simultaneously.

4 And there is a time line associated with that.

5 That's like -- I'll call that the principal function.  
6 I'm not aware if there is anything going for any contingency  
7 act. For example, like so far I don't think that's out.

8 For example, the contingency acts would be oh, geez, we've  
9 gone beyond what we thought we were and we need some people  
10 to get down to, you know, wherever the turbine-driven aux  
11 feedwater pump is and somebody to go to probably the steam  
12 generator dump valves, you know?

13 And here is how -- here is what I need, how  
14 much time do I have? I don't think that is actually part  
15 of the order right now. Am I right?

16 MR. BOWMAN: What we are looking --

17 PARTICIPANT: I think that's where --

18 MR. BOWMAN: -- for is a basis to make a  
19 reasonable conclusion that the operators can do what they  
20 need to do. What we have gotten in the case of some of  
21 the -- we have gotten things as strange as saying at time  
22 one hour after the event, I will declare that I am at an  
23 extended loss of AC power and at time one hour into the  
24 event, I will have all the load stripped off my DC buses.

25 So I'm sending questions back to those

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1 licensees saying how can you show me that you can reasonably  
2 accomplish that in that zero time? We haven't yet gotten  
3 a proposal on how they are going to present the reasonable  
4 phases for making that conclusion or modifying the time  
5 period that they have assumed in order to make it something  
6 that is more reasonable.

7 The feasibility study under the NUREG may be  
8 the way to go, but we have not specified that they need  
9 to use the, what was it, NUREG 1932?

10 MEMBER STETKAR: It's 1921.

11 MR. BOWMAN: 1921.

12 MEMBER STETKAR: 1921. It's called Fire  
13 Human Reliability Analysis Guidelines, but there is a  
14 qualitative section in there that is really good that kind  
15 of walks you through this sort of process --

16 MR. REED: I mean, it's an interesting idea.

17 MEMBER STETKAR: -- dealing with the time  
18 line.

19 MR. REED: I mean, I -- my first --

20 MEMBER STETKAR: And stuff.

21 MR. REED: -- thinking of it is I would look  
22 at my facility and decide whether, in fact, I can -- really  
23 if there is reasonable chance I can lose my DC power source  
24 depending on what my external events are. And if I can,  
25 I wouldn't even worry too much about that. It means I

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1 would have the contingency.

2 But for somebody that does have, you know,  
3 like a significant water event and it looks like, you know,  
4 they turn into an island and they can lose their DC, that's  
5 a different situation, you know? It's interesting,  
6 because they are likely to lose it.

7 MEMBER STETKAR: I only brought it up because  
8 sometimes we have had experience where operators say well,  
9 I've got training, I've got people. I can go do this.  
10 I can go mechanically operate something.

11 MR. REED: Yes.

12 MEMBER STETKAR: And I have actually gone to  
13 a plant where people said I can go mechanically operate  
14 this piece of equipment. So well, let's go look at the  
15 piece of equipment. First of all, they couldn't find it.

16 MR. REED: Yes.

17 MEMBER STETKAR: Second of all, they needed  
18 a ladder to get to it. And third of all, once they got  
19 the ladder and they could see it, they couldn't reach it.

20 MR. REED: Yes.

21 MEMBER STETKAR: But they knew on paper that  
22 they could operate it.

23 MR. REED: I hear you.

24 MEMBER STETKAR: And a simple feasibility --  
25 you know, I'm assuming that people submitting these plans

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1 have gone through at least, you know, sort of that level  
2 zero of analysis.

3 MR. REED: Well --

4 MEMBER STETKAR: I'm just curious because  
5 that isn't a full HRA, you know, these guidelines going  
6 off on quantifying things and scenarios and all of that  
7 kind of stuff.

8 MR. REED: Yes, in fact, I think for some of  
9 the hardened vets, the water -- the valves are underwater  
10 and --

11 MEMBER STETKAR: Right.

12 MR. REED: I hear you. I don't think that  
13 is going to happen here, but at least the initial cut,  
14 I'm pretty confident.

15 MR. BOWMAN: The initial cut will make an  
16 evaluation of what they provide us. And as has happened  
17 with the B.5.b inspections, we will go out and walk through  
18 with chosen operators from the plant and have them show  
19 us that they can actually do it.

20 MR. REED: Okay.

21 MR. BOWMAN: So I don't think we are going  
22 to see it in a full-blown completely sound HRA. If somebody  
23 wanted to do that or the feasibility study such as the  
24 prior one, that would be something for us to take a look  
25 at, but in my mind, it is going to be the site-specific

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1 verification inspections where we get boots on the ground  
2 and eyes on the valves and see whether or not we got something  
3 that actually can be done.

4 MR. CHEOK: I think this is a good discussion  
5 on HRA. And one thing that we need to think about is  
6 potentially the use, the PSFs as qualitative factors like  
7 -- so you have the performance shaping factors as  
8 qualitative factors that we need to look into.

9 MEMBER STETKAR: You guys are getting too far  
10 into HRA and straying away from can it be done by a reasonable  
11 person in a reasonable period of time. That is sort of  
12 square zero. And that's the way it is presented in this  
13 NUREG.

14 We are not talking about performance shaping  
15 factors. We are not talking about any numbers at all.  
16 This is just simply laying out a time line I need to get  
17 accomplished from, like you said, at, you know, 1.00 hours  
18 I'm going to declare you better go do this. And from that  
19 point until it is not a good day, I need to accomplish  
20 --

21 MR. REED: Right.

22 MEMBER STETKAR: -- some series of tasks.

23 MR. REED: It sounds to me like you are dialing  
24 it back to a more reasonable level appropriate for this  
25 application, as opposed to fire, which are, I think, much

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1 more significant and you would want to be --

2 MR. BOWMAN: Yes. Well, our approach is we  
3 are asking the question. Tell us how you would like to  
4 accomplish these sections fire human reliability report.

5 MEMBER STETKAR: Okay. Well, that's  
6 essentially the same question.

7 MR. REED: Sorry. You all set? Do we want  
8 to go to Slide 14? This is our concepts. First, truly  
9 a snapshot of what we think our idea is that we could use  
10 to put in place a robust, much more robust supplemental  
11 AC power source and that would be something that's pretty  
12 similar in many ways to an alternate AC power source, but  
13 better.

14 It would be electrically independent from your  
15 emergency AC power sources, of course. It would-- it might  
16 make sense. We're not certain. It might make sense for  
17 this to be diverse in design. And by that I mean, if  
18 somebody could come and show that, for example, your  
19 emergency AC power sources are more susceptible to  
20 earthquakes and this other thing is not, maybe there are  
21 different failure modes, that, to me, would be a good thing.

22 You know, I'm just thinking out loud. So  
23 we're not sure about that, that's an idea we are putting  
24 out there whether it makes sense to be diverse. We would  
25 want it to be physically located to minimize the chances

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1 that it -- to fail at a common cause from an external event.

2 If, in fact, that makes sense for that facility.

3 Okay. So that's not always necessary, but  
4 this could also be also as open as maybe it's on a tractor  
5 trailer and you can move them in, too. So it's not  
6 necessarily fixed, it could be moving, but -- and if you  
7 don't really have anything that can destroy, you know,  
8 across your facility a lot, maybe this doesn't necessarily  
9 have to be too far away.

10 So this is another idea. Every -- the intent  
11 here though is you want the thing to survive, so you see  
12 the concepts here. Design the thing, so that it has a  
13 very good chance of surviving versus your 1E diesel  
14 generators, which presumably -- or one or both survive,  
15 basically that's the idea.

16 Of course, it has to have the capacity and  
17 capability of powering the equipment we need to power it.

18 In our situation, this is equipment that directly relates  
19 to the key functions of core cooling spent fuel, core cooling  
20 containment, that's what we are concerned about. And it  
21 could do that through, presumably, if you have an intact  
22 four KV bus or motor control centers, that would be where  
23 you would do it.

24 With design sets, you would give it the maximum  
25 flexibility to power anything, basically, any available

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1 thing that is left. Any emergency AC bus, any motor control  
2 center that would be appropriate to power given the lows  
3 of, you know, what we are talking about here and what needs  
4 to be powered.

5 And then it would be protected to a level of  
6 greater than or equal to any supplied equipment, so that's  
7 the strongest link in the chain. The last thing to go.

8 This is -- it's easy to say, not easy to do. I'm not  
9 sure you can protect something greater than the reactor  
10 coolant pressure batteries, frankly, that's, you know,  
11 got the blown out forces from LOCA and seismic in it, but,  
12 you know, I'm saying as a principle that you want this  
13 thing to be very robust. And you want it to be the last  
14 thing to go.

15 And obviously, if the equipment it supplied  
16 is destroyed by the event, it makes no sense for you to  
17 design this thing to beyond that. So that's the concept.

18 And like I said, we are throwing these concepts out and,  
19 of course, you want to have at least one training equipment  
20 that we are talking about. So presumably, you could even  
21 have one, you know, boosted up train, if you wanted to  
22 think about it, one more robust train in this thing.

23 And of course, similar to the portable  
24 equipment, it has got to be able to interact with the  
25 equipment that you are interacting -- connected to in both

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1 directions, so one doesn't destroy the other. So that  
2 just goes without saying with these kind of sources.

3 So what this thing is it's sort of like a 1E  
4 diesel generator, which is already protected per design  
5 basis, but it can supply anything. It would be physically  
6 located away for sure, in that case, from the other 1E  
7 diesel generators.

8 MEMBER STETKAR: Tim, what's the difference?

9 I don't --

10 MR. REED: This was not allowed, of course,  
11 at all with the order as you guys heard.

12 MEMBER STETKAR: -- get it. This was not  
13 allowed under the order?

14 MR. REED: This was not allowed. In fact,  
15 you know, to be honest with you, internally lower level  
16 we thought that we should have -- you should be allowed  
17 to use a more robust source, but that was ultimately not  
18 what came up.

19 And I personally like this, because I like  
20 engineered approaches rather than humans, you know, if  
21 you can do it, you know, personally.

22 MEMBER STETKAR: Let me --

23 MR. REED: I think -- by the way, one more  
24 thing and I'll let you go. I'm sorry. I think this would  
25 be great if you could take your current blackout diesel

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1 generator and boost it up to this, because now I don't  
2 -- I keep that thing and now it is great for everything.

3 No matter if it's a short or long duration blackout, it's  
4 great and it certainly gets the sunny day stuff for certain.

5 And maybe the other guys go to this. So you can see some  
6 of the ideas that were thrown out. It's an idea and I'm  
7 not sure it is cost-beneficial for people to follow it  
8 or use it, to be honest with you, but maybe for new reactors.

9 MEMBER STETKAR: Would people use this in lieu  
10 of any of the portable on-site equipment?

11 MR. REED: My thought is that you will need  
12 Phase 3. And by that I mean, these extreme events are  
13 going to -- could take your -- probably would take your  
14 grid out for quite a long period of time. And there is  
15 always concern about, you know, consumables and  
16 replenishing on-site no matter what.

17 Okay. So I think you are going to need to  
18 be able to take on off-site systems and resources and be  
19 able to use that, that part of that I see that for anyone,  
20 no matter how good your design is.

21 Now, for beyond design basis extreme event,  
22 I think even if you have this thing, it's going to require  
23 manual actions to put it in place and it is going to be  
24 an extreme event. I think you still have to be able to  
25 have some mitigation for some period of time and I don't

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1 think it is necessarily 10 minutes or an hour. You know,  
2 so I think there is mitigation on the front end, but then  
3 I would allow credit to power everything up.

4 If you are willing to do this, I'm going to  
5 give you credit to power up, because I think this, frankly,  
6 gets a lot more safety benefit for stuff that really can  
7 happen as opposed to the on beyond external event. So  
8 I mean, I'm being very honest about that. So that's --  
9 it's a thought, it's a concept. We are putting it out  
10 there.

11 I know -- and you can jump in, I think some  
12 of the new reactor designs are pretty close to this or  
13 maybe don't -- doesn't take a whole lot more for them to  
14 go from where they are to this. And so it might be best  
15 to just --

16 MR. BOWMAN: I'm sorry, the new reactor  
17 designs have diesels that fail at the same seismic  
18 acceleration. So if this is another diesel that fails  
19 at the same seismic --

20 MR. REED: Yes, but --

21 MR. BOWMAN: -- we can have 800 instances,  
22 right?

23 MR. REED: Yes. You would put some sort of  
24 a turbine.

25 CHAIRMAN SHACK: But I think the diesel is

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1 pretty rugged. I mean, I'm more worried about the guy  
2 doing the maintenance. And if he is doing the maintenance  
3 on this diesel and he is doing the maintenance on that  
4 diesel and he screws it up?

5 MR. REED: If they are the same?

6 CHAIRMAN SHACK: If they are the same, you  
7 know.

8 MR. REED: Yes.

9 CHAIRMAN SHACK: That's --

10 MR. REED: That is diversity.

11 CHAIRMAN SHACK: -- the problem I'm sort of  
12 seeing. You know, I'm willing to believe you can hang  
13 this thing together for the seismic thing. It's all the  
14 other common cause failures that I'm worried about and  
15 what it has to connect to.

16 MR. REED: Yes. Yes, that's --

17 CHAIRMAN SHACK: If it's sitting there.

18 MR. REED: -- not promising any relays and  
19 stuff that may survive. I mean, maybe the thing takes  
20 out the -- the same event takes out what you would power  
21 and then this is not worthwhile.

22 CHAIRMAN SHACK: Well, this is a concept,  
23 that's where I will put it at.

24 MEMBER STETKAR: But the portable stuff might  
25 be worthwhile.

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1 MR. REED: Yes.

2 MEMBER STETKAR: See my whole point is if you  
3 are thinking about this in lieu of on-site pumps that you  
4 can connect, because by definition all of the in-the-plant  
5 pumps are there and by definition all of the in-the-plant  
6 switchgear is there and by definition all of the  
7 in-the-plant cable is there, I would rather have a few  
8 pumps sitting around in tin sheds that can pump high pressure  
9 water into places that I can connect or low pressure water  
10 --

11 MR. REED: Right, mitigating strategies.

12 MEMBER STETKAR: -- into places that I can  
13 connect, then yet another piece of equipment that can  
14 generate electricity that I can't shoot across the gaps  
15 that I didn't think about.

16 MR. REED: That's the --

17 MEMBER STETKAR: And that's -- well, but by  
18 throwing -- what I was really curious about, there is quite  
19 a bit of time spent, there is a whole slide here, in the  
20 document talking about this as if it is a panacea.

21 MR. REED: I hope I didn't --

22 MEMBER STETKAR: Diesel -- buying diesels are  
23 pretty cheap.

24 MR. REED: Yes.

25 CHAIRMAN SHACK: Well, again, though isn't

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1 there a tradeoff that, you know, this would power up lots  
2 of stuff.

3 MR. REED: Well --

4 CHAIRMAN SHACK: And if at the source, the  
5 flex stuff -- I always pictured the flex stuff as just  
6 sort of giving me enough to hang on by my fingernails.  
7 And you know, maybe I have to see exactly what is planned  
8 by that, but I -- you know, it seems to me the capabilities  
9 that I'm getting there are just enough to survive.

10 Whereas with this, I would have, you know,  
11 a lot of equipment that I would be powering up and I would  
12 get, you know, a big bang. And so I -- my chances -- I  
13 mean, all of these things have a certain probability of  
14 success.

15 MR. REED: Yes.

16 MEMBER STETKAR: You know, my probability of  
17 success here might be high enough compared to the portable  
18 equipment that I would like.

19 CHAIRMAN SHACK: It depends on the concept  
20 of this. And I didn't -- I'm not sure that I still  
21 understand the concept.

22 MR. REED: Yes.

23 CHAIRMAN SHACK: I have seen plants in Europe  
24 who have installed very, very robust, very, very bunkered,  
25 very independent and diverse systems with their own power

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1 supplies, their own instruments and their own pumps and  
2 their own piping connections. And they are pretty darn  
3 robust. They are installed for a variety of reasons and  
4 they are really, really expensive.

5 You know, if that's the intent here, that's  
6 one thing. But --

7 MR. REED: Well, let me put a scenario out  
8 there.

9 CHAIRMAN SHACK: -- if it's yet just another  
10 diesel --

11 MR. REED: What if for your facility you don't  
12 have much of an earthquake issue and you are only flooding  
13 and your current diesels are in a place where maybe they  
14 are susceptible to flooding and I put this thing in and  
15 it's way above any flood.

16 MEMBER STETKAR: Yes.

17 MR. REED: There is one where I think this  
18 would -- there are some circumstances where this thing  
19 would be absolutely great. You know, it's almost going  
20 to be specific to the situation.

21 MEMBER STETKAR: Well, sure. On a  
22 site-specific --

23 MR. REED: Yes.

24 MEMBER STETKAR: -- basis --

25 MR. REED: Yes.

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1 MEMBER STETKAR: -- I can certainly see it.  
2 That's right.

3 MR. BOWMAN: We are seeing little aspects of  
4 this in the Mitigating Strategies Order where later on  
5 in the Phase 3 activities, the licensees are talking about  
6 bringing in 4160 volt, I think, generators that are 2 to  
7 4 megawatts and hooking them up and shifting fusing residual  
8 heat removal.

9 MR. REED: Yes.

10 MR. BOWMAN: Yes.

11 MEMBER STETKAR: Well, that's the original  
12 concept that I thought though was applied to flex.

13 MEMBER RAY: Let me ask you a question that  
14 pertains to that that I have been trying to simulate here  
15 for a long time.

16 We have been talking for two hours plus about  
17 a lot of things that I would say are surrounding the reactor  
18 coolant system, supporting, maintaining its integrity  
19 perhaps. Do we really know what goes on long-term, I'm  
20 talking long-term now, in the reactor coolant system?  
21 Can we really maintain natural circulation cool down at  
22 plant without you losing level control and so on?

23 If so, how do we know that or where did  
24 we --

25 MR. BOWMAN: We are looking into the analyses

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1 that have been provided to us right now.

2 MEMBER RAY: Hum? Is it part of this rule  
3 in any way?

4 MR. REED: Part of the order.

5 MEMBER RAY: Because, you know, again, I look  
6 at this as somebody who has run a plant and I just never  
7 ever wanted to be in a position. I had to cool down on  
8 natural circulation.

9 MR. REED: It's really long-term scenario.

10 MEMBER RAY: And if we know what we are talking  
11 about, I would like to know where we get the information,  
12 because as important as all of the supporting systems,  
13 just hanging on by the fingernails or more robustly  
14 supporting the plant, I would like to know if we really  
15 know what we are talking about when it comes -- what is  
16 going on in the plant itself.

17 MR. REED: Yes. Yes, those analyses -- they  
18 are doing those analyses and they are, you know, very  
19 long-term, small LOCAs on natural circ and, you know,  
20 worrying about, you know, criticality, for example, in  
21 the long-term, bubbles in the head.

22 MEMBER RAY: Get a bubble in the head. I  
23 don't know where the level --

24 MR. REED: We transfer --

25 MEMBER RAY: -- is any more.

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1 MR. REED: -- the steam generator.

2 MEMBER RAY: You know.

3 MR. REED: I know. And --

4 MR. BOWMAN: And maintaining circuit-  
5 based --

6 MR. REED: Yes.

7 MEMBER RAY: Do I have to depressurize? If  
8 so, how the heck am I going to do that?

9 MR. REED: Yes, you do. You do depressurize,  
10 of course, to limit RCPC or LOCAs, but you don't go down  
11 too far, obviously, one step to the other steam generators.  
12 You want to get an accumulator injection, because that's  
13 a huge volume.

14 MEMBER RAY: I'll accept that I've got the  
15 DC power to my instruments and I can see my instruments,  
16 but they are not telling me everything I need to know maybe.

17 I just -- where does that fit here? I guess you are saying  
18 well, that's not part of what we are talking about today.

19 That's some place else.

20 MR. BOWMAN: Well, that's part of the  
21 Mitigating Strategies Order identifying what the time  
22 constraints for the things that they have to do required  
23 a thermal hydraulic analysis to licensees who have done  
24 that. And rule on the fact that we're asking the questions  
25 we need to ask.

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1           MEMBER RAY: Do we get to review that? Does  
2 anybody know? I mean, because you know, there are lots  
3 of, I'll say, optimistic assumptions people can make.  
4 And I'm just wondering does that just get stamp review  
5 or what happens that defines what -- John, do you want  
6 to talk?

7           MEMBER STETKAR: No. Actually, I mentioned  
8 this to Bill earlier that since he is a short timer, one  
9 of us is probably going to need to pick this up. Eric  
10 said that they are going to be issuing draft SERs with  
11 open items at some point on these plans. And I suspect  
12 that will be an opportunity for us to take a look at those  
13 after you have, you know, some exchanges with the licensees  
14 and give us a little bit better understanding on how the  
15 staff is grappling with this and sort of the way that  
16 licensees are looking at it.

17           MEMBER RAY: We talked about four KV. I mean,  
18 you know, to me, I had to get off-site power back. I mean,  
19 that was it.

20           CHAIRMAN SHACK: Well, that's what I meant  
21 by hanging on by my fingernails.

22           MEMBER RAY: I know. And --

23           CHAIRMAN SHACK: And not just I want a big  
24 power source that just --

25           MEMBER RAY: -- don't tell me I can't have

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1 off-site power, at least, you know, in a day or something,  
2 because --

3 MR. BOWMAN: You might not.

4 MEMBER RAY: I know. And that's what I'm  
5 saying. I don't know what the answer is to -- what happens  
6 if I don't? I really don't. And that's just me speaking.

7 And if the Agency knows why, good for them. I just would  
8 like to know when we are going to find out, because it  
9 isn't that easy to dream your way through one of these  
10 to a long-term stable condition.

11 MR. BOWMAN: Okay. Well, we will find out  
12 eventually, I guess.

13 MR. REED: Anything else on --

14 MEMBER STETKAR: Did this --

15 CHAIRMAN SHACK: You can say we don't want  
16 to answer it.

17 MEMBER STETKAR: The motivation for this  
18 comes from you or from industry or is it as a result of  
19 things you have looked at?

20 MR. REED: This is -- I would say staff is  
21 motivated here.

22 MEMBER STETKAR: I was just curious, you know.

23 MR. REED: I mean, I have mentioned this to  
24 industry folks and I think most engineers think, yeah,  
25 you know, this would be -- rather do this. This would

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1 be the preferable thing to do.

2           You know, I think we tend to be like that,  
3 you know, because we are like let's build a fortress and  
4 make sure everything survives and we don't think so much  
5 of this portable mitigating -- I call it MacGyver stuff,  
6 you know. But so this is some of that. And if we can  
7 -- if you can get some of these things and you do have  
8 some and it's pretty good and you can fire from the entire  
9 train, you know, you really are in good shape compared  
10 to where you were.

11           Now, you have instrumentation, that's a real  
12 challenge with this. So it's an idea. I mean, I'll throw  
13 that out. And hopefully -- I want to hear from designers  
14 and new reactor folks and see what they think, you know,  
15 because they have much more robust designs. You know,  
16 they have better GEC-2 external designs. They have  
17 conversatism in there. The have 50 years of experience  
18 to building in.

19           For those folks, I think this is something  
20 I think that they can -- I think they can justify as they  
21 will have this thing. They won't be inundated by, you  
22 know, that very -- much, much less likely than the current  
23 100 plus guys out there operating this. So that's why  
24 we put it out there and let's see what we get back and  
25 see whether we can continue pursuing it.

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1                   You may not see it at the proposed rule stage,  
2 but maybe you will.

3                   MEMBER SCHULTZ: Well, I've only heard about  
4 it --

5                   MR. REED: Truly a snapshot.

6                   MEMBER SCHULTZ: I have only heard about it  
7 conceptually, but my understanding is that some  
8 international operators are taking this approach to provide  
9 extra capability at their facilities. That's the, you  
10 know, AC source, diesel generator with pump or without  
11 pump or both. These are the types of things that have  
12 been used at other --

13                  MR. REED: Yes.

14                  MEMBER SCHULTZ: -- utilities, not in this  
15 country.

16                  MR. REED: I was just mentioning, you know,  
17 that it's not the same as this, but I'll call it a hardened  
18 piece. And Ginna was looking at, I'll call it, the core  
19 cooling part hardened and that's a motor-driven aux  
20 feedwater pump with its own power supply bunkered and a  
21 24 hour supply seismic of water, which is a big upgrade  
22 to that perceived plant. That's one little piece, not  
23 the whole piece, not hardened everything and this is kind  
24 of just a hardened power source. We don't have the entire  
25 hardened core, if you will.

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1 CHAIRMAN SHACK: I'm going to suggest we take  
2 a break here. 15 minutes. Tim has been going at it pretty  
3 good.

4 MR. REED: Yes.

5 CHAIRMAN SHACK: And so we will come back at  
6 25 of, not quite 15 minutes.

7 (Whereupon, the above-entitled matter went  
8 off the record at 3:23 p.m. and resumed at 3:37 p.m.)

9 CHAIRMAN SHACK: Okay. We can come back into  
10 session. Onwards and upwards.

11 MR. REED: Okay. Why don't we move then--  
12 we are on Slide 15. I'll try to move forward here a little  
13 bit. You will recognize in the draft regulatory basis  
14 and the draft rule concepts we have something outlined  
15 there for change control. This is kind of in the same  
16 bin with treatment. You know, when you get outside the  
17 special treatment requirements and beyond design basis  
18 land, there is really nothing there.

19 In 50.59 doesn't work so well either and you  
20 are outside the design basis. It was really designed to  
21 -- the design basis kind of thing in Chapter 15 for that  
22 kind of thing. And so recognizing the pedigree of these  
23 requirements, they stem from an adequate protection order  
24 and the need, obviously, to maintain its configuration  
25 over time. It's pretty important. There should be

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1 something there, change control and we certainly think  
2 that's appropriate.

3 Now, recognize that whenever you do anything  
4 to your facility, you're going to apply all your change  
5 control mechanisms because as we have talked about several  
6 times today, we are going to be touching on modifications.

7 We're going to be touching on some of the most important  
8 equipment in the facility, so obviously 50.59 applies  
9 insofar as you touching, you know, any of that stuff.

10 And directly as well, your normal change  
11 control process in terms of electrical process and  
12 physical interactions and everything like that make sure  
13 that's okay. It's a very challenging situation. And I  
14 think it's very challenging in this circumstance, too.

15 So you would apply that as well as 73.58, you  
16 know, safety security interface if, in fact, you have  
17 interfaces with security stuff. So I just recognize that  
18 those would be applied regardless.

19 But having said all that and in terms of making  
20 changes to this stuff itself, that's -- in terms of its  
21 ability to actually be a better mitigating strategy, if  
22 you will, that's where I think we are kind of. We don't  
23 really have anything in place.

24 And so the suggestion is that we would have  
25 something that would -- right now, the suggestion is that,

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1 obviously, assure that your changes continue to meet the  
2 new requirements. And if you don't feel or you have doubt  
3 about that, then you would come to the NRC for some review  
4 and approval under 50.59 on the amendment process.

5 So that's what is in there right now. That's  
6 not in the order itself, but a similar concept is in NEI-1206  
7 and Eric could probably cite the page and the section.  
8 But so this is -- this was recognized as important to do  
9 to maintain this stuff, maintain the configuration, assure  
10 that changes to it are, you know, at least neutral or  
11 enhancing strategies over time and that other changes don't  
12 inadvertently, you know, cause these things to be less  
13 effective. So that's the concept, that's what is on this  
14 slide. I'll pause if you have any thoughts or you want  
15 to chime in.

16 MEMBER SKILLMAN: Yes, my thought is that the  
17 industry is so familiar with 50.59 that it may be more  
18 advantageous to adapt 50.59 with some additional words  
19 that give guidance for how to move into this particular  
20 concept. And the reason I say that is because 50.59  
21 accomplishes a couple of things:

22 Licensing configuration control, design  
23 configuration control and plant physical status  
24 configuration control.

25 A new rule or a new -- something new might

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1 detract from the current rigor, particularly in plants  
2 with the 50.59 process is rigorous, might detract from  
3 the rigor that is there and very often in the corrective  
4 action team inspections, it is the weakness of the 50.59  
5 process and, particularly the root causes and that type  
6 of thing that is identified so rapidly, it causes licensees  
7 to take action.

8           So it seems like maybe keeping 50.59 and  
9 adopting within it a phrase or two to address this may  
10 be a stronger way to proceed.

11           MR. REED: We actually have an old 50.59  
12 person and a newer 50.59 person. I did 50.59 consulting  
13 before I came here, but I was actually thinking something  
14 like that at 1.1 in the draft. I was suggesting that if  
15 you made changes to the mitigating strategies and relied  
16 upon equipment, that, you know, basically enhance or  
17 improve upon ability to maintain or restore core cooling  
18 spent fuel pool cooling and containment capabilities, for  
19 example, or enhance the regional protection. Clearly,  
20 that's -- those are all good things.

21           I wasn't able to -- I was thinking on the old  
22 -- what used to be seven criteria, what are now eight.  
23 You know, I was thinking about that. I couldn't come up  
24 with anything very easy.

25           50.59 itself is kind of blind to this stuff.

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1 It just doesn't even -- it doesn't see it. It's -- so  
2 I mean, at least the way it's in the guidance and everything  
3 has been endorsed to date, I think.

4 MS. MCKENNA: This is Eileen McKenna again.

5 I think that one of the key points is that this change  
6 control process would be in addition to the 50.59.

7 MR. REED: It is.

8 MS. MCKENNA: And still have to do that to  
9 make sure that whatever they are doing to their equipment,  
10 procedures and whatever still maintains the scope of what  
11 50.59 applies to. It's kind of an additional check that  
12 whatever you are doing doesn't undue something that you  
13 had intended to do in this regard.

14 I think part of the challenge, you know, as  
15 50.59 is written, it really refers to the FSAR. A lot  
16 of this kind of mitigating type of information would not  
17 appear in the FSAR itself. It would be in other documents.

18 I would also note that this is similar to some change  
19 control provisions that are in 51.50 having to do with  
20 aircraft impact, which is a similar kind of challenge,  
21 if you will, to the plant. It's not an FSAR kind of analysis  
22 per se, but it is something that you want to maintain  
23 whatever you have developed and said this how I deal with  
24 that scenario.

25 So I understand your point, because I have

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1 certainly lived with 50.59 for quite a while. Yes?

2 MEMBER STETKAR: Eileen or Tim, we tend to  
3 get kind of focused in on specific issues. I wanted to  
4 ask you there are concepts, at least in my mind, similar  
5 to this already. In the new reactor design it is written.

6 MS. McKENNA: Yes.

7 MEMBER STETKAR: If anyone were to ever invoke  
8 50.69 risk informed categorization of SSEs, there is a  
9 concept of non-safety-related importance to safety  
10 equipment. It has additional controls.

11 MR. REED: Verse 2.

12 MEMBER STETKAR: Verse 2.

13 MR. REED: Yep.

14 MEMBER STETKAR: Isn't this stuff  
15 conceptually similar to those things? In other words,  
16 haven't we already grappled either in new reactors under  
17 the concept of how we are assuring maintenance of adequate  
18 reliability and change control for written -- this  
19 equipment and even under the existing rules and regulations  
20 for risk to equipment? And we have already grappled with  
21 this?

22 MR. REED: I would -- on the -- 50.60 --

23 MEMBER STETKAR: Do we need new and different  
24 things only because this is under a different rule?

25 MR. REED: Pit stop. I have to say something

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1 about 50.69. In terms of risk to equipment, typically,  
2 that would be something that was probably in your PRA.  
3 In other words, it came out as a risk achievement.  
4 Something -- some how you found out that was important  
5 and you had some assumptions that you credited in that  
6 PRA and those are where -- there is where I would lock  
7 it in in terms of what credit you assume. That would be  
8 how I would control that.

9           Whereas this stuff, I don't have that kind  
10 of quantitative PRA-type of thing. I have more of a  
11 subjective, you know, type of defense in depth thing.  
12 You know what I'm saying? Are you following me?

13           MEMBER STETKAR: Well, no, I'm trying to--  
14 you know, once I'm some poor licensee somewhere who has,  
15 you know, tons of regulations to follow --

16           MR. REED: Yes.

17           MEMBER STETKAR: -- I'm only interested in  
18 this particular piece of equipment for whatever reason  
19 is in one box.

20           MR. REED: Yes.

21           MEMBER STETKAR: That box is not called  
22 safety-related. It is called something that is kind of  
23 important to my plant.

24           MR. REED: Right.

25           MEMBER STETKAR: And it strikes me that I

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1 wouldn't particularly enjoy having --

2 MR. REED: I agree. Another -- yet another  
3 thing.

4 MEMBER STETKAR: -- three separate  
5 categories of the way I need to think about these things.

6 MR. REED: Yes.

7 MEMBER STETKAR: Simply because the criteria  
8 of putting it in that box were different. In one case  
9 it might be a PRA. In another case it's also PRA-related.  
10 In this case, although I haven't necessarily done a formal  
11 PRA, it has been judged important for plant safety for  
12 some reason.

13 MR. REED: Yes. I don't like to have yet  
14 another thing out there.

15 MEMBER STETKAR: Yes, I --

16 MR. REED: I agree with that.

17 MEMBER STETKAR: -- was just sort of trying  
18 to probe the waters to see whether or not you have thought  
19 about those other types of controls that at least to a  
20 greater or lesser extent that the Agency has already  
21 grappled with.

22 MR. REED: Well, I'm familiar with 50.59 and  
23 73.58 and the 50.69, which is brought up, those three.  
24 I don't have a magic bullet here, a solution. I certainly  
25 definitely agree that it is -- we don't need another change

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1 control version out there. We can avoid it. It would  
2 be nice to have a much simpler framework.

3 MEMBER STETKAR: Because as I understand it,  
4 there are plants that are, indeed, trying to pilot the  
5 50.69 process.

6 MR. REED: Yes.

7 MEMBER STETKAR: And indeed if it gains some  
8 acceptance in the industry from plant now that has adopted  
9 that approach, I now have a bin of equipment that I'm  
10 treating in that Risk 2 category.

11 MR. REED: Yes.

12 MEMBER STETKAR: And I'm going to need to  
13 comply with the rules.

14 MEMBER BLEY: I don't know how far along that  
15 process is. Do we have a special treatment settled for  
16 that? It's not settled for RTNSS as I recall.

17 MR. REED: 50.69 spelled out all the treatment  
18 regulation of the different boxes.

19 MR. BOWMAN: It is spelled out right there.

20 MR. REED: In other words, Risk 2 obviously  
21 has it right in there as well as monitoring through time.

22 And Risk 3 taking off the special treatment requires Risk  
23 3. You know, removing the special treatment. So, yes,  
24 it has it in there.

25 MEMBER BLEY: Well, it has monitoring, but

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1 it specifies how often it has to be monitored. I didn't  
2 remember that.

3 MR. REED: It has special treatment also in  
4 there.

5 MEMBER BLEY: Okay. The periodicity is  
6 specified.

7 (Simultaneous speaking.)

8 PARTICIPANT: I didn't think that --

9 PARTICIPANT: I don't --

10 MR. REED: We weren't bound to that level.

11 PARTICIPANT: -- much detail --

12 MR. REED: But that was going to be a license  
13 amendment, review and approval.

14 MEMBER BLEY: Yes.

15 MR. REED: You know, and have the integrated  
16 panel and the whole works and the PRA and peer review and  
17 the whole works. So a lot of controls and rigor in that.

18 MEMBER STETKAR: But you know, my only point  
19 is that we are hearing this kind of in the early stages  
20 of this rulemaking where there has probably been a  
21 reasonable amount of progress not to the level of detail  
22 that you are mentioning on what that type of special  
23 treatment would be, both in terms of maintaining and  
24 assurance of the reliability and things like change  
25 control.

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1 MR. REED: Yes. I would have --

2 MEMBER STETKAR: This should be able to build

3 --

4 MR. REED: I would probably view this as--

5 I'm not sure it goes to Risk 2, but this is a really--

6 CHAIRMAN SHACK: But here you are addressing  
7 uncertainty, rather than risk.

8 MR. REED: I agree.

9 MEMBER BLEY: Well, I'm not sure there is a  
10 difference between the two, Dr. Shack?

11 MR. REED: I think Risk 2 seems to be --

12 CHAIRMAN SHACK: You can fortify one to a  
13 higher degree than the other. I think the risk is --

14 MR. REED: That's just me, my personal  
15 opinion.

16 CHAIRMAN SHACK: -- uncertain.

17 MEMBER BLEY: Well, yes, I --

18 MR. REED: And it's interesting if you note,  
19 also I'll just point out, that right now it just says,  
20 you know, basically, what I think any licensee would do  
21 to continue to comply with the requirements. So you could  
22 argue that this doesn't do anything. Any licensee is,  
23 you know, a reasonable licensee would, of course, not make  
24 changes that get the amount of compliance with the new  
25 regulation.

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1           So I just wanted to point out right now that  
2           it is there almost like to say hey, you definitely need  
3           to maintain configuration control over this stuff. It's  
4           almost just an advertisement, essentially, right now the  
5           way it is done. It's not in the detailed set of criteria  
6           or anything like that. So I'm not -- I want to make sure  
7           --

8           CHAIRMAN SHACK: But I mean the experience  
9           one had with the aircraft B.5.b equipment sort of  
10          says --

11          MR. REED: Yes.

12          CHAIRMAN SHACK: -- that, you know, you do  
13          need to look at this.

14          MR. REED: You can't just neglect it.

15          MEMBER BLEY: And the experience we have seen  
16          at least used to see in the past with systems that had  
17          an expert train that wasn't required, very often the parts  
18          weren't even there. They needed them for the other pump.

19          CHAIRMAN SHACK: Yes, for the other one there.

20          MR. REED: So that's all I have on change  
21          control. Are you all set? Can we move to Slide 16? This  
22          is a little more interesting. As I mentioned before, you  
23          know, we have a set of requirements already in place on  
24          Station Blackout, but those are, you know, a much more  
25          benign blackout and a shorter duration blackout.

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1           But the way it is actually being implemented  
2 at facilities right now is ELAP. Of course, it's a nasty  
3 blackout and so it's being linked right into the station  
4 blackout EOP as response not obtained, if you will point,  
5 when you can't get any AC power back off-site or on-site,  
6 so they are working at the implementation level very nicely.

7           As to whether that would always be a perfectly  
8 smooth transition, I think it will work out that way.  
9 We will see if that's the case, because even a guy with  
10 a station blackout, the AC power source has to, basically,  
11 throw the way and be able to do it with batteries without  
12 anything.

13           And I think that probably always means you  
14 are going to be in a definite coping plant, but we will  
15 have to see how that shakes out. So I think it will be  
16 a very good linkage between the current blackout stuff  
17 and the new mitigating strategies at an implementation  
18 level, but we will see.

19           And then what we have right now, the thought  
20 right now is pretty simplified and it's just simply to  
21 say it's a link between 50.63 and the new 50 XXX. I know  
22 you say, essentially, that if -- you know, you're going  
23 to exceed your specified duration, then you go to the  
24 mitigating strategies, that's simple, at the regulation  
25 level.

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1           And so that links the two together and that  
2 does -- it voids -- it's almost bandaied regulation, but  
3 it avoids the situation that I don't lose anything of 50.63,  
4 it remains in place. So I don't lose diesel generator  
5 the liability. I don't lose AC, station blackout AC diesel  
6 generators. They stay in place because they are complying  
7 with 50.63.

8           That's not the best way in the world to do  
9 rulemaking, but that's what we are at right now. And that  
10 --

11           MEMBER RAY: Okay. One more time.

12           MR. REED: I want to be very blatant in other  
13 words.

14           MEMBER RAY: One more time.

15           MR. REED: Yes, sir.

16           MEMBER RAY: 50.63, I know what I have to have  
17 done to satisfy 50.63. Now, what if I can't satisfy the  
18 new requirement for indefinite loss of AC power relative  
19 to what we were talking about earlier? I can't show that  
20 I can cool down a plant to a -- a reactor to and maintain  
21 in a safe shutdown condition either in hot standby or cool  
22 down whatever? What do I do? Is there some requirement  
23 for me to be able to show that?

24           MR. REED: They have to comply with the order.  
25

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1 MEMBER RAY: Um-hum.

2 MR. REED: I mean that was --

3 MEMBER RAY: I mean, what -- no, no. Let me  
4 stop you right there. Because --

5 MR. REED: Yes.

6 MEMBER RAY: -- you can order me to bring a  
7 bunch of stuff in to mitigate a beyond design basis accident,  
8 but I'm -- this is a more fundamental question, which is  
9 do I have to show that that stuff will have the effect  
10 indefinitely of keeping the core safe? Is that something  
11 I need to show you or do I just need to do all this stuff?

12 MR. BOWMAN: Under the order they have to show  
13 us.

14 MEMBER RAY: Really? Okay.

15 MR. REED: Show as opposed to demonstrate?

16 MR. BOWMAN: Well --

17 MR. REED: I mean, I think I know where you  
18 are going.

19 MEMBER RAY: You know what I mean by show.  
20 I don't mean have an accident and demonstrate it. I am  
21 talking about --

22 MR. REED: Yes.

23 MEMBER RAY: -- give me an analysis that--

24 MR. REED: What's enough.

25 MEMBER RAY: -- gives me a high confidence

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1 that you can actually do this. You've got to do this.

2 MR. REED: How much confidence do you need?

3 MEMBER RAY: Huh?

4 MR. REED: Is what you are asking. How far  
5 do you have to take it? How much do we have to have --  
6 do we have to demonstrate.

7 MEMBER RAY: Well, yes, I mean, I know what  
8 I would want if I really -- if I didn't think this was  
9 ever going to happen, I might say do your best and it's  
10 better than it was. But I don't think that's what we are  
11 talking about here, if you are talking about rulemaking.  
12 You are talking about something that is equivalent to  
13 50.63, but now for a much longer period of time. Well,  
14 okay.

15 MR. REED: Actually, I see it as a backstop.

16 MEMBER RAY: Well, that's different though.

17 MR. REED: See what I'm saying?

18 MEMBER RAY: That's what I keep hearing you  
19 say is this is -- this makes things better.

20 MR. REED: For 50.63, yes.

21 MEMBER RAY: All right. But now I'm hearing  
22 something different for this than --

23 MR. REED: I don't have a -- I personally don't  
24 have a lot of confidence, perhaps I should, but I don't  
25 have as much confidence for using this stuff for the beyond

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1 design basis events.

2 MEMBER RAY: Well --

3 MR. REED: But I have a lot of confidence that  
4 it would work very well for a normal blackout and actually  
5 for a bunch of other stuff.

6 MEMBER RAY: Yes, I understand. But I am  
7 really poking at something else here, which is what are  
8 -- do we really imagine this enables us to say about extended  
9 loss of off-site power? I'm not saying there is anything  
10 here that, you know, it's a bad thing to do or it doesn't  
11 help, but what is the real claim that we are making?

12 MR. REED: If any?

13 MEMBER RAY: Because I do understand 50.63.

14 MR. REED: Yes.

15 MEMBER RAY: Is it the same, but just longer  
16 --

17 MR. REED: No. Actually --

18 MEMBER RAY: -- or not?

19 MR. REED: -- I would like to say that this  
20 -- the claim I am making for the mitigating strategies  
21 is that it is an additional capability providing the license  
22 -- proposing a licensee only for uncertainties for beyond  
23 design basis external events and I'm going to integrate  
24 that with station blackout to get that addressed also.

25 MEMBER RAY: Okay. But it's because we keep

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1 saying this is -- these are mitigating strategies and  
2 mitigation by definition is limited in what it can claim  
3 to do.

4 MR. REED: Yes.

5 MEMBER RAY: Are we also showing that if we  
6 do these mitigating strategies, we can keep the core safe  
7 indefinitely? And that's the basic question I am asking.

8 And I keep seeing him say yes, but I hear you saying not  
9 quite.

10 MR. REED: Well, I'm very confident.

11 MR. BOWMAN: I will say that the order as  
12 issued says maintain or restore core cooling amongst other  
13 things. And the approach that has been proposed by  
14 industry is to set up these strategies and they have set  
15 up the acceptance criteria for the strategies given the  
16 assumptions that are made that have been described in any  
17 act, 1206, as being no fuel damage.

18 We are in the process of reviewing the analyses  
19 and we have not yet come to conclusions about it.

20 MEMBER RAY: Okay.

21 MR. BOWMAN: But they purport to show that  
22 they can --

23 MEMBER RAY: I know that's the industry's aim.

24 MR. BOWMAN: -- report down to the --

25 MEMBER RAY: I mean, it's a very --

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1 MR. REED: Yes.

2 MEMBER RAY: -- laudable and correct one, but  
3 I just am trying to ask a slightly different question I  
4 think, which is what is -- what are we, the Agency, saying  
5 is the requirement here or the result?

6 Okay. Maybe this is taking it far enough.  
7 I'll let it go for now, but I'll be back.

8 MR. REED: Okay. Okay. Yes, sir?

9 MEMBER SKILLMAN: I think Harold is on to  
10 something. Let me just pull the thread a little bit  
11 further.

12 MR. REED: Yes.

13 MEMBER SKILLMAN: If you have an extended loss  
14 of off-site power, let's say you do not have a plant  
15 casualty, the plant is healthy. The reactor coolant system  
16 pressure boundary is intact. On the loop you lose your  
17 reactor coolant pumps, diesel start and you have got  
18 emergency core cooling at 4160, hopefully in abundance,  
19 maybe you have a lot of staff with your supplemental.

20 You might have some added AC at 4160 that will  
21 help you with that, a couple of other devices that will  
22 help you bring that plant down the way you want to bring  
23 it down that won't involve your heaters, so you can control  
24 pressure, involve emergency feedwater, probably if you  
25 are lucky you have electric feedwater pump, emergency

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1 feedwater pump, so you can begin to land the plant.

2 What comes to my mind is how long do you have  
3 to do this? If you take one of those plants I'm talking  
4 about that's on a moat or its accessed only by a bridge  
5 or a number of bridges and there are a number of plants  
6 that are like that. To get to them, you have to get eight  
7 or 10 bridges. If the earthquake takes out all of those,  
8 the plant sustains the casualty and is healthy.

9 You now have a fuel requirement that probably  
10 exceeds your 30,000 or 50,000 gallon tanks, because you  
11 are going to continue to power the plant. You won't need  
12 as much power, but you are going to need it for however  
13 long it takes for someone to come in and give you a new  
14 bridge or five new bridges.

15 And so I think what this ultimately ends up  
16 in is a race to find out how much fuel you can keep available  
17 for your diesel generators or if your warning on one of  
18 your previous slides from an alternate source, it could  
19 be a combustion gas turbine generator or something such  
20 as that.

21 MR. McCONNELL: This is Matt McConnell again.

22 I think one thing we have to be careful about is giving  
23 too much credit to diesel generators in that situation.

24 Our diesel generators are only qualified for 30 day mission  
25 times, so even if you were able to refuel them up to that

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1 point, I think the fact is that in that situation, you  
2 are relying on restoration of off-site power or some other  
3 equipment from off-site in addition to, you know, the  
4 equipment you have available on-site.

5 MEMBER RAY: Yes, it's --

6 MR. McCONNELL: So I think that even in the  
7 Fukushima case they were able to restore off-site power  
8 within 12 days.

9 MEMBER RAY: Well, the extended loss of  
10 off-site power is a very big deal for some plants. I'm  
11 just going to wait and see what happens.

12 MEMBER SKILLMAN: Thanks, Matt.

13 MR. McCONNELL: You're welcome.

14 MEMBER SKILLMAN: Okay. Thank you. I made  
15 my point.

16 MR. REED: Really?

17 MEMBER SKILLMAN: I think it's how long can  
18 you run those engines?

19 MR. REED: Let's see here, I think I'm on the  
20 last bullet. I also have a question right here in the  
21 appendix that requests stakeholders' views on whether this  
22 should be an integrated rule that integrates the new  
23 strategy requirements 50.63 and 50.54(hh) (2) recognizing  
24 that the loss of large areas due to explosions, fire or  
25 mitigating strategies are largely enveloped by the new

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1 mitigating strategies, as reside, of course, in  
2 50.54(hh) (2) .

3 So we have a question on whether that is a  
4 better way or a more appropriate way of doing it as opposed  
5 to the way we are currently going on. So just to let you  
6 know that that is back in there also.

7 MEMBER BLEY: Have you done many -- have you  
8 heard anything from industry about that? And have you  
9 talked about it much? Do you have much thought about it?

10 MR. REED: At this time, I haven't heard  
11 anything yet and I haven't interacted with industry yet  
12 on that specific issue. I know industry has looked at  
13 this and they are reading it, but I don't have anything.  
14 That goes, by the way, on all the regulations so far.

15 MEMBER ARMIJO: What would be the alternative  
16 to this approach? Are there like any?

17 MR. BOWMAN: Well, there is the way that is  
18 laid out in the regulatory basis leaving 50.63 essentially  
19 unchanged, except for a connector to a new section, perhaps  
20 50.155, and leaving 50.54(hh) (2) where it is. This  
21 question asks should we wind together 50.63, the new stuff  
22 and the 50.54(hh) (2) all into a single rule?

23 MR. REED: Let me give you an example. Does  
24 it make sense for a new reactor to do a coping determination  
25 of 50.63 any more with this new stuff? You know, these

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1 are questions that we are thinking of. You could go in  
2 and literally delete 50.63 and replace it with something  
3 else.

4 Now, there is some downside to that, as I  
5 mentioned. You know, there is very good things about 50.63  
6 and alternate AC, it gives general liability. They may  
7 be captured on other places. I'm not saying it can't be  
8 done, but that's a thought. You know, you could go in  
9 and do something like that. I also would recognize that  
10 there are, I bet, thousands of documents and calculations  
11 that refer to 50.63 and those are historic in their place.

12 So I recognize that's out there, too. That  
13 creates some confusion, too.

14 CHAIRMAN SHACK: Well, I mean, the commentary  
15 you got the last time you went out was to leave 50.63 alone.

16 MR. REED: Yes.

17 CHAIRMAN SHACK: Yes.

18 MR. REED: I did. And I understand that.

19 CHAIRMAN SHACK: I expect that you're going  
20 to get the same answer back.

21 MR. REED: I think I will.

22 CHAIRMAN SHACK: Yes, you have already had  
23 one try at it. I don't think they are going to change  
24 their minds.

25 MR. REED: I personally think that is probably

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1 the least impact right now.

2 MEMBER RAY: Well, but you still have the  
3 rigor of what I was talking about. You're going to try  
4 not to extend that out.

5 MR. REED: Yes, yes.

6 MEMBER RAY: Yes, John?

7 DR. FLACK: Yes, if I could say something?

8 This is John Flack with the ACRS. I did work on, of course,  
9 50.63 some years ago, 20-some odd years ago, and pretty  
10 much one thing that this does bring to the table is the  
11 fact that when we did 50.63, we based it on coping times.

12 And when -- if a plant never exceeded coping time, it  
13 would go to core damage and we never thought about it after  
14 that.

15 So and then based on the core damage frequency  
16 with what it had at the plant, we determined whether it  
17 was enough, okay, with the industry average was somewhere  
18 around  $3 \times 10^{-5}$ , some were above, some were a bit below,  
19 but then when we went back and looked at that, it all came  
20 to around  $10^{-5}$  for station blackout and we felt we had  
21 accomplished our goal.

22 Mainly that the plants could cope with station  
23 blackout and recover from station blackout for the most  
24 likely events, but we never really addressed what happened  
25 if the alternate AC source failed or the plants went beyond

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1 the coping time. We felt that it was a low enough  
2 probability that that was okay for this set. There was  
3 other more important things to work on, at that point.

4 And now we look at it and this is basically  
5 a defense in depth. We are looking at what happens. We  
6 are asking a question why if it goes beyond the coping  
7 time? What if the AC -- the alternate AC source fails?

8 And I think that's a great thing, but I think it's a  
9 different space now.

10 MEMBER RAY: Right.

11 DR. FLACK: I think it's -- we are dealing  
12 with a different concept. We are no longer looking at  
13 the structure of the engineering that finds the plants  
14 coping time and how it can get there and do all the analysis  
15 that supports that.

16 MR. REED: Yes.

17 DR. FLACK: We are saying, you know, it just  
18 goes beyond that. And then what are you going to do?  
19 Okay. And that's a great question to ask and try to resolve,  
20 but it's not the complete question. It's not the complete  
21 answer because there is that piece that is still missing  
22 of how it keeps ringing up.

23 And that is well, at some point, you have to  
24 worry about the decay heat removal.

25 MEMBER STETKAR: Yes.

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1 DR. FLACK: And we are not talking about that  
2 here. Even in the original rule, we were separating plans  
3 out based on the DH or capabilities, whether they have  
4 one steam-driven pump, two steam-driven pumps. But it  
5 didn't make that much of an impact, at that point, and  
6 so we never categorized the plants any differently, whether  
7 they had one steam-driven pump versus two because they  
8 are actually at the level at which we were cutting off.

9 But the questions coming up now of how this  
10 DHR piece comes to bear on this process. And so I see  
11 the mitigating strategies as being limited that you are  
12 proposing, because it really only focuses on station  
13 blackout and recovering from station blackout. It doesn't  
14 really look at this other piece about decay heat removal.

15 And that raises a question of whether you need  
16 a mitigating strategy that is bigger than just station  
17 blackout. Although station blackout, I think, is a big  
18 chunk of this, because you get power back at a plant, you  
19 can do a lot of things, even stuff you haven't thought  
20 of before. So it's a good thing and it's probably a big  
21 chunk of it, but certainly not the whole piece because  
22 you could end up in situations where it is not going to  
23 get you out of trouble you think you are going to get out  
24 of if you don't consider the DHR piece and the natural  
25 circulation and the pump seal LOCAs and all these things

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1 in time.

2 MR. REED: Well, one thing I don't think we  
3 have mentioned enough is the final phase, you know, with  
4 off-site resources coming and I'm not sure that would  
5 address this issue. I think where you guys are going,  
6 I think Harold is going to, you know, a sound-- I think  
7 you are going to a place where, you know, this goes on  
8 for a long time, I'm losing inventory. If I don't get  
9 inventory back in the RCS, it's game over, you know. And  
10 that is critical no matter what, you know, in the end.

11 The off-site resources that come on-site are  
12 presumed -- we are hoping -- I think that the design of  
13 this thing is that will, in fact, make that happen. I  
14 don't think we have this --

15 MR. BOWMAN: And in fact for some of the sites,  
16 they have on-site reactor coolant system inventory makeup  
17 pumps that are high pressure pumps--

18 MR. REED: Yes.

19 MR. BOWMAN: -- for strategies in place to  
20 repower the installed charging pumps, to maintain  
21 inventory.

22 MEMBER RAY: Yes, well, sometimes you need  
23 the ability to depressurize, which is again --

24 MR. REED: Yes.

25 MEMBER RAY: -- just everywhere.

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1 MR. REED: Yes.

2 MEMBER RAY: So anyway, like I say --

3 MR. REED: I was trying to --

4 MEMBER RAY: -- we just need to keep our eye  
5 on this, because of the -- I think John said it well.  
6 I just see this as being in a different space than 50.63.

7 MR. REED: Okay.

8 MEMBER RAY: At the end of the day. And to  
9 abandon 50.63 presumes you are going to make this meet  
10 the same standards, I think. And I'm not sure you are  
11 ready.

12 MR. REED: Actually, I hope I don't -- I'm  
13 not communicating that way. I probably am poorly  
14 communicating, but what I'm saying is the way it is actually  
15 being implemented in the EOPs is that residual one-time  
16  $10^{-5\text{th}}$  core damage that was left after 50.63 is definitely  
17 going to be lower because it won't just give up after four  
18 hours and say okay, you know, I'm going to core damage.

19 No, actually at about two hours, they are going  
20 to be in the mitigating strategies, so they are going to  
21 be extending that for a substantial time. Now, they may  
22 not go on forever, but you certainly will drive down that  
23 frequency, because you will recover eventually something  
24 on-site or off-site for that type of a scenario.

25 So I'm not sure if that says it better, you

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1 know.

2 MEMBER RAY: Well, again, it puts it in the  
3 category of this is a positive step.

4 MR. REED: Okay.

5 MEMBER RAY: And it is mitigating and we  
6 should do it. I'm really trying to get at the question  
7 of well, okay, but are we also imposing a requirement that  
8 you have to perform relative to decay heat removal or keeping  
9 the core covered, lack of fuel damage? Is that a  
10 requirement? And you just have to do what you have to  
11 do in order for that to happen.

12 I don't think that is true, but it is within  
13 the coping time.

14 MR. REED: Well, I mean, the order is  
15 maintain/restore core cooling, spent fuel pool cooling  
16 containment indefinitely.

17 MEMBER RAY: Yes. Well, I heard those words.  
18 We will see what they mean.

19 MR. REED: Yes. I mean, obviously, the --  
20 it's what actually gets done, but --

21 MEMBER RAY: Yes.

22 MEMBER SCHULTZ: The question is is that an  
23 objective or a requirement?

24 MR. REED: That's a requirement of the order.

25 PARTICIPANT: It's already up there.

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1 MR. REED: But you know, it says maintain or  
2 restore.

3 MEMBER RAY: That's right.

4 MEMBER SCHULTZ: Yes.

5 MEMBER RAY: And --

6 MR. REED: That's --

7 MEMBER RAY: -- God knows what that means.  
8 I don't know.

9 MEMBER ARMIJO: Well, I think it is -- what  
10 I got out of Harold's question is how can you prove it,  
11 that you will meet the requirement?

12 MR. REED: That's a very valid comment and  
13 how much do you need to provide -- prove? How much assurance  
14 do you need for this kind of circumstance? What are we  
15 talking about here in terms of risk?

16 MEMBER RAY: Is the standard the same one you  
17 expected in 50.63? Yes or no? I think the answer is no.  
18 You don't have to answer my question.

19 MR. REED: Well --

20 MEMBER RAY: But I think the answer is no.

21 MR. BOWMAN: The analyses we are looking at  
22 are being done typically using the same software and the  
23 same acceptance criteria as was done for the 50.63.

24 MEMBER RAY: Yes, but you are having to make  
25 assumptions way out in time that you weren't making within

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1 the coping period.

2 MR. BOWMAN: Yes.

3 MEMBER RAY: And the software may be must fine  
4 at hour 60, but the assumptions may not be.

5 MR. REED: Yes.

6 MEMBER RAY: So anyway, like I said, I don't  
7 mean to be --

8 MR. REED: No, that's --

9 MEMBER RAY: -- testing or anything.

10 MR. REED: -- good input. Thank you. Let  
11 me go to Slide 17, implementation. This is really just  
12 simply recognizing that we have an order and we have a  
13 rule and we want to make sure that those don't get crossways  
14 with each other.

15 Of course, we want to avoid the limitation  
16 challenges and, of course, we certainly intend to employ  
17 our cumulative effects and regulation process in the final  
18 rule stage. That would probably be somewhere in the 2016  
19 time frame.

20 And in large measure, when you go and look  
21 at this portion of the reg basis, it's really looking at  
22 how this would be implemented and giving all the different,  
23 you know, synchronies or licensing regimes in Part 52 with  
24 all the different kind of things you can have there, the  
25 licensing space. That's really just -- you know, that

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1 just comes out of trying to work with Part 52, that's not  
2 too interesting, but it's very interesting to Part 52 to  
3 understand.

4 But you know, we have to be, you know, in all  
5 the different kinds of situations you can be in terms of  
6 designs and laws and everything else. So we are making  
7 -- and the end result it kind of simplifies the fact that  
8 whoever, you know, for fuel, you have to have this stuff  
9 done, you know, no matter how you do it up front.

10 But so that's really what the implementation  
11 side is trying to get to. I don't think there is too much  
12 controversial or interesting about that, I just pointed  
13 -- in the draft rule concepts and so I'm going to have  
14 that here.

15 MEMBER SKILLMAN: Let me ask a question,  
16 please.

17 MR. REED: Sure.

18 MEMBER SKILLMAN: On your page 37 at the top  
19 of the page --

20 MR. REED: Yes.

21 MEMBER SKILLMAN: -- this is in your document  
22 you write "Current licensee subject to the requirements  
23 of EA-12-049 or the equivalent license conditions are not  
24 expected to have significant implementation challenges  
25 and would not be required to resubmit information that

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1 was already provided for review in response to EA-12-049  
2 or the equivalent license condition."

3 Where did you get the information that there  
4 would not be significant implementation challenges? I  
5 can't imagine a licensee would communicate that.

6 MR. BOWMAN: That would be based on the  
7 entering argument that the requirements of the rule will  
8 be close to what the requirements of the order are, so  
9 they will have already undergone the implementation  
10 challenges under the order.

11 MR. REED: Yes, basically what that's saying  
12 is if you have implemented the order and were reasonably  
13 close to it, you are in pretty good shape in the rule.

14 MEMBER SKILLMAN: Yes.

15 MR. REED: That was trying to communicate that  
16 and failed, I guess.

17 MEMBER SKILLMAN: It would seem to me that  
18 some of the licensees would say that wasn't so easy after  
19 all.

20 MR. REED: No, I --

21 MEMBER SKILLMAN: That was pretty tough.

22 MR. BOWMAN: I only had to do it once.

23 MR. REED: Yes. I guarantee you it's not easy  
24 implementing 100 percent.

25 MR. BOWMAN: Then I would offer what you have

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1 in number one might need tweaking.

2 MEMBER SKILLMAN: Yes.

3 MR. BOWMAN: Thank you.

4 MEMBER SKILLMAN: Okay. Thanks.

5 MR. REED: Yes, I think it has been 20 -- 25  
6 to 30 million per site impact. This is extraordinarily  
7 -- this is a big deal.

8 MR. BOWMAN: This is a biggie, yes.

9 MR. REED: Anything else on implementation?

10 Now, we also additionally in the appendix there have some  
11 questions. Since we had an opportunity to go out for  
12 comment, we thought well, where else could we get some  
13 information that would help us finalize the reg basis,  
14 but also provide some mutual information for us moving  
15 -- going forward and trying to do our proposed rule and  
16 so that's what these questions go to.

17 They ask questions on -- the question already  
18 mentioned about maybe having one big integrated role,  
19 right? I won't be -- we already mentioned that.

20 But also, what is important for new reactors  
21 as -- at a high level, what makes sense for them? As well  
22 as we have specific questions. I think we have small  
23 modular reactors, a question about that. What should we  
24 do for those designs? So you will see that question.  
25 We hope to get good feedback there.

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1           We ask a basic question here on human  
2 reliability. That's probably the wrong words. I'm using  
3 human reliability. I understand it invokes PRA and I  
4 probably should not have used reliability, but really about  
5 human actions and these kinds of events. And it has been  
6 a theme we have heard today.

7           You know, how much can you rely on folks in  
8 these kinds of situations? And what kind of assurance  
9 do we need and what should we do? This has come up several  
10 times. We recognize that, too, so we have a questionnaire  
11 just to get feedback and what people's thoughts are.

12           And then to me, I think, probably the most  
13 useful thing is we have a lot of questions there, detailed  
14 questions on impacts and costs. This is part of what we  
15 tried to do with the reg basis, get this kind of information.

16           It is helpful for us doing our regulatory analyses and  
17 trying to give the Commission a full analysis of what the  
18 real impact of this thing is.

19           And in this case, we are going to try to roll  
20 in what the order impact was into the whole thing, so they  
21 can understand what happened to the order and the rule  
22 together. It helps the decision making process a great  
23 deal. So we have some detailed questions that support  
24 that effort.

25           So I just wanted to throw those out and see

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1 if you had any thoughts on that.

2 MEMBER SKILLMAN: I do. Let me ask this.

3 MR. REED: Yes.

4 MEMBER SKILLMAN: Where are the quality  
5 requirements specified for the equipment that will be  
6 considered?

7 MR. REED: Currently, they are in the  
8 implementation guidance for the order. I'm trying to  
9 think. We have something in the design. I'm not exactly  
10 what you want. I have some treatment requirements there  
11 in terms of some amount of testing, you know, and that  
12 kind of thing.

13 In terms of if you are thinking about something  
14 beyond like say a special treatment kind of thing beyond  
15 commercial, I wouldn't suggest that is even necessary.  
16 I would go with the commercial type of system structure  
17 component, but designed for the situation/circumstance  
18 that it needs to function for to minimize cost, so there  
19 can be more of them. That's kind of the idea that we have  
20 used when we go beyond design basis.

21 MEMBER SKILLMAN: Well, let me just --

22 MR. REED: So similar idea here.

23 MEMBER SKILLMAN: -- offer an observation.

24 MR. REED: Yes.

25 MEMBER SKILLMAN: A high quality John Deere

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1 does it for me.

2 MR. REED: Yes.

3 MEMBER SKILLMAN: Okay. But I can tell you  
4 a 1979 in March, April and May, for those of us who are  
5 TMI had to battle the NRC, because there were staffers  
6 in the middle of this accident saying we are going to have  
7 to follow the quality requirements of, you know, Appendix  
8 B.

9 MR. REED: Yes.

10 MEMBER SKILLMAN: And that turned out to be  
11 a wrestling contest because the real goal is get equipment  
12 now and we were begging them to send stuff. So we found  
13 ourselves confronted by this set of questions. The  
14 questions that the NRC might ask in terms of imposing  
15 requirements needs to be made clear.

16 MR. REED: Yes.

17 MEMBER SKILLMAN: So that industry knows--

18 MR. REED: Yes.

19 MEMBER SKILLMAN: -- length and depth of its  
20 procurement reach.

21 MR. REED: Yes.

22 MEMBER SKILLMAN: And if it's specified in  
23 the commercial grade, it's fine. It doesn't have to be  
24 queued on. It doesn't have to be subjected to Appendix  
25 B to 10 CFR 50 quality requirements.

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1 MR. REED: Yes.

2 MEMBER SKILLMAN: And the industry  
3 understands that very solvently. But unless that is made  
4 clear, then those who will be out trying to procure are  
5 going to be stymied by perhaps just the perception that  
6 there can be the Appendix B question.

7 MR. REED: Yes. And down the road for  
8 inspection and everything, it helps that, too.

9 MEMBER SKILLMAN: Yes. It just undoes all  
10 that --

11 MR. REED: Yes.

12 MEMBER SKILLMAN: -- rat's nest of  
13 complicated administration that is just a tinier -- it  
14 just kills your --

15 MR. REED: Yes.

16 MEMBER SKILLMAN: -- resources.

17 MR. REED: I hear you. I mean, commercial  
18 is the way we are going, so we are very much aligned.

19 MR. BOWMAN: That follows a lot of what is  
20 laid out in the --

21 MR. REED: We just need to be very clear.

22 CHAIRMAN SHACK: I mean, there is a statement  
23 somewhere that says you are probably going to have something  
24 very much like NEI 1206 as the implementing guidance, I  
25 think.

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1 MR. REED: Yes.

2 CHAIRMAN SHACK: That's --

3 MR. REED: We have an I -- yes, we have a  
4 JLD-ISG-1201 endorsing 1206. We're at zero.

5 MR. BOWMAN: We have already started working  
6 on our reg guide to memorialize it to go along with the  
7 fuel language.

8 MR. REED: Yes.

9 MEMBER BLEY: I think on your human  
10 reliability bullet, this issue of human performance, I  
11 think, is really crucial. I like John's thought about  
12 just getting zero level, make sure it is all there and  
13 you can use it.

14 But beyond that, you need some sense of how  
15 likely adverse conditions are. And three places I can  
16 think of going, one is ask people who have studied full  
17 scope PRAs and included external events as well. And,  
18 you know, what I'm thinking is you need some sense of what  
19 is the conditional likelihood given you have got a complete  
20 loss of power that you have an adverse environment.

21 You can look at real fires that have occurred  
22 and what the conditions were around them, including some  
23 in nuclear plants, but you look more broadly than that.

24 You can look at -- you know, I think real events and PRAs  
25 are a place a little bit of mining to give you a sense

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1 for this, but I think the likelihood that you have got  
2 tough conditions to operate in given you have got this  
3 complete loss of AC is a lot higher than maybe one thinks  
4 going in.

5 And many of those causes are pretty tough  
6 spots. And I think getting a feel for that will be real  
7 important when you think through how humans are going to  
8 perform in these scenarios and how well they can do the  
9 things you are expecting them to do.

10 MR. REED: Yes, I think I agree. I think,  
11 in fact, in a severe event like this, you could have, you  
12 know, adverse impact from the humans themselves. So it  
13 could get very challenging.

14 I know some of this is part of the strategy  
15 lighting and that kind of thing. Obviously--

16 MEMBER BLEY: Yes.

17 MR. REED: -- critical. But having enough  
18 people, being able to get them there, what's their state  
19 of mind? Can they do it? Is it easy enough to do? Is  
20 it simple? I think those are for --

21 MEMBER ARMIJO: Well, the Japanese  
22 experienced that, you know. That's -- the Daini site just  
23 about 10 miles --

24 MR. REED: Right.

25 MEMBER ARMIJO: -- south of the Daiichi site,

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1 they had not as severe of an event, but it was pretty bad.

2 And they demonstrated superb performance, even though  
3 their families lived in the little villages right around  
4 the plant and worked through -- you know, they lost all  
5 the lights, except in control, which they had batteries.

6 MR. REED: Yes, no HVAC. Again, it was pretty  
7 nasty.

8 MEMBER ARMIJO: But they delivered. They  
9 saved those plants.

10 MR. REED: Yes. Is there any other thoughts  
11 on this, on Slide 18? Well, we will move to Slide 19.  
12 I think you guys are getting worn out. I'm wearing you  
13 out? Eric is hoping you are complete worn out and you  
14 don't even want to hear him.

15 Next steps. This is just to let you know,  
16 we are going -- where we are going to from here. The  
17 comment period for the draft reg basis ends on May 28<sup>th</sup>,  
18 this is the time period right now.

19 We will consider that feedback, revise reg  
20 basis, come up with something we think is a final reg basis  
21 and then we are tasked to notify the Commission by  
22 Commission, the Commission assistants know, and July is  
23 -- we let them know where we stand on that, so we will  
24 do that.

25 And then, of course, move forward into the

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1 proposed rule state taking the feedback we hear from  
2 stakeholders on the reg basis and, of course, the feedback  
3 here and using that to formulate our proposed rule package,  
4 including the guidance, of course. And that's -- right  
5 now, as we already previously mentioned, the proposed rule  
6 is June 2014, June 30, 2014. The final rule is late  
7 September -- late December, excuse me, 2016 to the  
8 Commission. So that's the current schedule.

9 We, of course, know this Committee's interest  
10 and we are, of course, open to meeting with you, you know,  
11 as you see fit. We, of course, will meet with you on the  
12 proposed rule and final rule stage, that goes without  
13 saying. So I just want to make sure that we recognize  
14 that. So that's the next steps.

15 Anything on that? All right. I think the  
16 next agenda item is Eric and I'm not sure if there is any  
17 more that you need to say. I mean, an awful lot came out  
18 on the -- as we went through this thing.

19 MEMBER BLEY: How do you see this process of  
20 tying in the strategies with the integration process of  
21 the various kinds of procedures working out? Would these  
22 be, even after that integration process, some kind of  
23 stand-alone guidances that would be keyed out of the EOPs?

24 MR. BOWMAN: The way it has been proposed is  
25 a set of guidelines that industry has chosen to call flex

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1 support guidelines.

2 MEMBER BLEY: Yes.

3 MR. BOWMAN: And essentially, they will have  
4 the station blackout procedure and when they get a response  
5 not obtained in that, then they go off to the flex support  
6 guidelines to do what it tells them to do to implement  
7 the strategies and guidance.

8 MEMBER BLEY: So anywhere, you hit like a  
9 deadend on that?

10 MR. BOWMAN: Right.

11 MEMBER BLEY: And obtain good kickoff to the  
12 --

13 MR. BOWMAN: Yes.

14 MEMBER BLEY: Okay.

15 MR. BOWMAN: And we will have exit criteria  
16 from the flex support guidelines into the SAMGs if it becomes  
17 necessary.

18 MEMBER BLEY: It has been a little while since  
19 I have been deeply into the lost power EOPs, but some of  
20 them have some pretty rapid sequences of actions that you  
21 need.

22 MR. BOWMAN: Right.

23 MEMBER BLEY: So I guess the only thing I would  
24 say is we need to be careful that if you somewhere along  
25 the line you hit a response not obtained, that there needs

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1 to be a path of continuing with the things you can do or  
2 you run out of time. And if you run out of time, you are  
3 just -- you are done. You can't get the water in.

4 MEMBER SCHULTZ: Well, the question that goes  
5 along with that is is that process suitable? In other  
6 words, should one not get the equipment that might be  
7 required on the way before you get the response not obtained?

8 MEMBER BLEY: I think it needs some good  
9 thought --

10 MR. REED: Some things are moving rapidly.

11 MEMBER BLEY: -- to lay this thing out, yes.

12 PARTICIPANT: Then you may have waited too  
13 long.

14 MR. BOWMAN: And that's why we thought -- got  
15 the specifications in there that the licensees have to  
16 identify what the time constraints are --

17 MEMBER BLEY: Yes.

18 MR. BOWMAN: -- so that they know what the  
19 time frame needs are for getting the portable pump in place,  
20 for instance, or whatever the appropriate action is.

21 MEMBER BLEY: All right. It has come up in  
22 other scenarios, but since I've been thinking about this  
23 here, a not unreasonable way you get in this spot is through  
24 electrical faults that lead to fires. And now you have  
25 got an EOP that is a tough one to do in any case. You

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1 have these guidelines along with it and you have got a  
2 fire procedure going on all at the same time, so I think  
3 it's a lot more than just an independent looking at times  
4 for each of these actions and simple linkage into the  
5 procedures. I think it requires a good bit of work for  
6 us to get there to a place that it will actually work if  
7 you have got behind this.

8 CHAIRMAN SHACK: Okay. Any more questions  
9 for the staff? Well, thank you very much. It has been  
10 a very interesting experience.

11 MR. REED: Thank you.

12 CHAIRMAN SHACK: Thank you. I liked reading  
13 the regulatory basis document.

14 MR. REED: Yes.

15 CHAIRMAN SHACK: It's a good document and  
16 looking forward to seeing some of the responses to the  
17 Mitigating Strategies Order.

18 MEMBER BROWN: Did you do that right before  
19 you went to sleep or what?

20 CHAIRMAN SHACK: You are not.

21 MEMBER BROWN: I'm not.

22 CHAIRMAN SHACK: There is a full Committee  
23 meeting in June that we will be doing this. And I'm  
24 expecting we will actually have a letter, because I'm sure  
25 we will have comments to be made, but I think your

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1 presentation is going to have to be trimmed down a little  
2 bit, but somewhat similar. Luckily we have good  
3 representation here today, so we had a chance to do it.

4 Comments from the Committee? Steve?

5 MEMBER SCHULTZ: Well, I was going to ask  
6 really the Committee's consideration of when we would want  
7 to hear next additional information. You talked of wanting  
8 to hear somewhere sooner than 2014.

9 CHAIRMAN SHACK: No, I agree with John. I  
10 mean, I think we will want to see some of these. You know,  
11 when we have SEs for some of these mitigating orders, we  
12 would probably like to see that. Although, I have the  
13 feeling that since there are implementation plans, there  
14 is going to be less there than we would like to see, but  
15 I think we will have to see what is there and then decide  
16 where to go from there.

17 MEMBER STETKAR: Well, it would at least be  
18 an opportunity to --

19 MR. REED: Yes.

20 MEMBER STETKAR: -- for us to see what type  
21 of exchange has been going on. You know, what kind of  
22 questions you have been asking.

23 CHAIRMAN SHACK: Yes.

24 MEMBER STETKAR: And what sort of feedback  
25 you have gotten from the industry, whether it is points

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1 toward more detail or it remains, you know, fairly vague  
2 and obtuse.

3 MEMBER SCHULTZ: Well, that would be my final  
4 comment, which relates to the care in which will be required,  
5 should be required to assure that statements that are made  
6 in the rule and the guidance all fit together very carefully  
7 to explain what is an objective, what is a requirement,  
8 how will it be done. All of those things need to be very  
9 carefully presented and documented in a variety of ways.

10 We have seen examples here today where just  
11 a small amount of miscommunication can come from something  
12 we are trying to document carefully. It's going to be  
13 very important from many aspects that we have discussed  
14 in implementation to assure that not only is the preparation  
15 carefully done, but a review and a full understanding that  
16 peer review might be appropriate here, regulatory peer  
17 review to assure that we have achieved what we are trying  
18 to.

19 CHAIRMAN SHACK: Dick?

20 MEMBER SKILLMAN: I found the regulatory  
21 basis document to be well-written and thorough. It  
22 certainly pointed me into what I think is the right direction  
23 to contribute to this meeting. So I give you high marks  
24 for what you have started here.

25 Just as an independent party of one, I like

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1 the idea of the supplemental diesel, but I recognize that  
2 that carries with it starting air, lubricating all cooling,  
3 the need for copious fuel, it's got to be founded properly,  
4 cables and interconnections need to be done properly, the  
5 switchgear needs to be at the technical robustness level  
6 that will assure that when you start the engine and load  
7 the machine, it functions the way it is expected to function.

8 But I am kind of in your camp of having a couple  
9 of those is very good medicine. It can overcome a lot  
10 of problems in terms of cooling auxiliary pumps, battery  
11 chargers, fire fighting capability, ventilation, with a  
12 couple of extra engines. And they are not expensive.  
13 And they are dependable. They are robust and dependable.

14 Thank you.

15 CHAIRMAN SHACK: Yes.

16 MEMBER BLEY: Yes, I too like where you have  
17 come. Two words Dick said that stuck in my head, it's  
18 a good start and there is a lot of details to work out,  
19 but we are on the right track. Nothing in detail to add.

20 CHAIRMAN SHACK: Harold?

21 MEMBER RAY: Well, I want to, in addition to  
22 the word presented to us here today, recognize our  
23 consultant's, John Flack, status report. I thought it  
24 was very thorough and I recommend it to all the Members.

25 I guess I am a prisoner of the situation in

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1 which I was for many years convinced that we could not  
2 not only not lose AC power for an extended period, but  
3 we couldn't lose off-site power for an extended period.

4 And that any requirement that would come about, I remember  
5 this very clearly in the licensing days, that would impose  
6 that as a requirement would require changes to the plant  
7 design.

8 Now, we are imagining mitigating strategies  
9 for exactly that situation and I'm just not sure that the  
10 real core issues that concern me then and concern me now  
11 are addressed sufficiently, in our minds at least. I hear  
12 that we are going to keep the core cool, restore cooling  
13 and so on. We'll wait and see how that happens.

14 And, you know, it is a challenge to deal with  
15 getting all this mitigating strategy equipment in place  
16 and so on and so forth, but it is going to be a bigger  
17 challenge, in my judgment, at least in many cases, to  
18 demonstrate that it will have the effect that we want it  
19 to have and the industry clearly wants it to have, which  
20 is to avoid fuel damage.

21 I'm just going to have to wait and see on that  
22 because, obviously, I don't have the ability to make a  
23 judgment about that until we see what the analysis  
24 demonstrates.

25 So as important as all of the considerations

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1 that we place on the mitigating strategies are, I want  
2 to also understand what the behavior of the plant is,  
3 basically, that we are able to mitigate and how effective  
4 that can be given differences in plant design and the  
5 challenges of operating.

6 Now, we talk about the challenges of operating  
7 the mitigating equipment. They are big, but there is a  
8 challenge in just operating the reactor itself under these  
9 circumstances that I think we need to be mindful of. That's  
10 all I have to say.

11 MEMBER ARMIJO: Yes, my turn? Yes, I thought  
12 that the basis document was very well-written and very  
13 educational. One thing that crossed my mind is, and  
14 probably the industry has looked into it, but, the Japanese,  
15 you know, are a head of us in this problem that they have  
16 got all but one of their reactors dead in the water for  
17 two years.

18 And they -- when I was in Japan last year,  
19 they seemed to buy every piece of equipment that was  
20 manufactured in the western world and most of Asia. And  
21 I didn't see any plan or pattern, but I think that was  
22 just in the initial stages. I'm sure they have sorted  
23 out what is the most, at least in their minds, effective  
24 way of dealing with these events.

25 And I was just wondering if the staff is

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1 monitoring what they have been doing just to get an idea  
2 of, you know, if they have some good ideas, great. If  
3 they don't, well --

4 MR. REED: I know the JLD is and Dave Skeen  
5 is. Yes, I'm not personally. I have heard that, so  
6 secondhand from JLD.

7 MEMBER ARMIJO: Yes. And so, you know, they  
8 have got a very tough regulatory environment and they have,  
9 in the past, always had the leadership of the U.S. solving  
10 these problems before they had to. Now, they have to do  
11 it now or they will never get those things started.

12 So I just wondered if the staff shouldn't be  
13 monitoring or at least checking to see if they have got  
14 some good ideas. That's it.

15 CHAIRMAN SHACK: John?

16 MEMBER STETKAR: Nothing more. I thought it  
17 was a really good exchange. I learned a lot. Thank you.

18 CHAIRMAN SHACK: Mike?

19 MEMBER RYAN: I second John's comment, in  
20 particular, and thank you for a thoughtful set of briefings  
21 today and the materials are very well-done as well. I  
22 learned a lot. Thanks.

23 MEMBER BROWN: I can't add anything more than  
24 that, so I'll stop there.

25 CHAIRMAN SHACK: John?

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1 DR. FLACK: Yes. I --

2 CHAIRMAN SHACK: Christina, could you open  
3 up the lines?

4 DR. FLACK: Yes, I think the separation of  
5 50.63 from the mitigation strategies is the right way to  
6 go. I don't think we want to bring those two together.

7 As I was saying before about the structure of 50.63 and  
8 how you are going into the mitigation strategies, I think  
9 the mitigation strategies is -- you talk about the black  
10 swan, you know, the kind of unknown, unknown that is out  
11 there.

12 You need a lot of flexibility to be able to  
13 deal with those events that maybe you haven't even thought  
14 of, but they could happen, right? And so I see that as  
15 a different kind of class of events that could occur at  
16 a plant, but we always have to keep looking and giving  
17 the best opportunity to deal with those that we can and  
18 not try to regulate it to death by forcing them to put  
19 in equipment to deal with everything you can think of,  
20 but giving enough flexibility and opportunity for them  
21 to deal with it should it come up.

22 And I think the way this is moving, you know,  
23 is the way to go within that regard. You know, bringing  
24 in equipment -- seeing what kind of equipment you could  
25 do -- you could use, the biggest bang for the buck. But

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1 again, I don't think it is complete in the context without  
2 the decayed heat removal piece.

3 I think that -- I know you get to the point  
4 where you say well, the game is over at that point. Well,  
5 you know, that's what we said with the original station  
6 blackout. We said well, you know, if they went beyond  
7 coping, the game is over at that point.

8 Now, we are actually going beyond that. We  
9 are looking a little further than that. And I think you  
10 can keep going with that. I think you just keep looking  
11 for ways in this mitigating strategy and maybe it is broader  
12 than just station blackout. It could involve 50.54(hh).

13 I mean, it could be just one rule that deals with this  
14 and somehow, you know, structure that in a way that you  
15 can go about looking at these different things in a certain  
16 way.

17 Blackout is important. I think -- I always  
18 felt that that was the most significant event that could  
19 occur at a plant.

20 CHAIRMAN SHACK: Yes.

21 DR. FLACK: If you don't have power, you are  
22 dead in the water, you know. And so I think this is finding  
23 a lot of good stuff here. So that's all my comments.  
24 Thank you.

25 CHAIRMAN SHACK: Does anybody out in the

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1 audience have any questions, comments? On the phone?

2 Is the line open? Would somebody at least say hello?

3 MS. CAMPBELL: Hello. I don't have any  
4 questions.

5 CHAIRMAN SHACK: Okay. Thank you.

6 MR. BYRD: Hello. No questions here either.

7 CHAIRMAN SHACK: Okay. Well then thank you  
8 very much. I think at this point we can adjourn. And  
9 again, thank you again for an interesting day.

10 (Whereupon, the meeting was concluded at 4:40  
11 p.m.)

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# Station Blackout Mitigation Strategies Rulemaking

Advisory Committee on Reactor Safeguards  
Regulatory Policies and Practices Subcommittee

April 23, 2013

# Purpose

- Discuss with the ACRS the draft regulatory basis for the Station Blackout Mitigation Strategies rulemaking in conjunction with the status of the implementation of EA-12-049 (mitigating strategies order):
  - Basis for moving forward with rulemaking
  - Current thoughts on draft rule concepts (appendix)
- Obtain ACRS feedback to inform our regulatory efforts going forward

# Background

- Previously briefed the Regulatory Policy and Practices Subcommittee on December 5, 2012
- Since that briefing:
  - Staff developed and sent to the Commission - COMSECY-13-0002 (dated 1/25/2013)
    - Requested consolidation of NTTF Recommendation 4 and 7 regulatory activities
    - Requested revised rulemaking schedule to align with implementation of EA-12-049
  - Commission agreed in SRM-COMSECY-13-0002 (dated 3/4/13)
- Revised scope and major schedule milestones:
  - Address the regulatory actions stemming from NTTF Recommendation 4 (recommendations involving station blackout and mitigation strategies)
  - Address the regulatory actions stemming from NTTF Recommendation 7 (recommendations involving the spent fuel pool (SFP))
  - SBOMS Regulatory Basis (currently issued for public comment): CA Note to the Commission - 7/8/2013
  - SBOMS Proposed Rule (with guidance): June 30, 2014 to the Commission
  - SBOMS Final Rule (with guidance): December 2016 to the Commission

# Background

- This action is closely linked to EA-12-049, Recommendation 8 and Recommendation 9.3
  - Staff understands the overlap is actively managing these interfaces
- Previous Commission direction:
  - By SRM-SECY-11-0124 the Commission directed that rulemaking be initiated with an Advanced Notice of Proposed Rulemaking (ANPR)
  - Use a performance-based regulatory approach similar to B.5.b requirements (now sec. 50.54(hh)(2))
- NRC published the Station Blackout (SBO) ANPR on March 20, 2012
  - Staff held Category 3 public meeting on April 25, 2012
  - ANPR comment period ended on May 4, 2012
  - 45 comment submissions
  - Feedback was reviewed and supported efforts to developed the SBOMS draft regulatory basis

# Background

- Issued SBOMS draft regulatory basis for 45 day comment period
  - Federal Register published on April 10, 2013 (78 FR 21275)
  - Comment period ends May 28, 2013
  - Regulations.gov – NRC-2011-0299
  - Plan to hold public meeting in mid-May 2013

# Basis for SBOMS Rulemaking

- Requirements issued to power reactor licensees via EA-12-049 (and equivalent license conditions) need to be made generically-applicable
- Current station blackout requirements (sec. 50.63) do not provide for:
  - Station blackouts involving damage to both the onsite and offsite ac power sources from beyond design basis external events (including unavailability of alternate ac power)
  - Site-wide events (i.e., multiple power reactors in a station blackout)
  - Station blackouts that extend indefinitely
  - Spent fuel pool cooling
  - Not applicable in all modes of operation
- For these reasons alone there is a sound basis for rulemaking
  - Consequently there is a need to amend Station Blackout requirements in sec. 50.63 and revise existing guidance

# Basis for SBOMS Rulemaking

- Commission directed rulemaking:
  - SRM-SECY-11-0124 directs the staff to initiate rulemaking activities on an expedited schedule (24-30 months)
  - The draft regulatory basis supports moving forward with rulemaking (still as a high priority action) consistent with that Commission direction but on a revised schedule in light of the orders
  - Revised schedule (per SRM-COMSECY-13-0002) reflects broad scope of EA-12-049 (largely bounds Recommendation 4) addressing safety issues and the need to obtain feedback and lessons-learned from EA-12-049 implementation to inform the rulemaking
- Clearly there exists sufficient basis for rulemaking
  - The staff is using these interactions (both the ANPR and the draft regulatory basis issuance) as opportunities to interact with external stakeholders, enhance the rulemaking and improve the rulemaking product

# Basis for SBOMS Rulemaking

- Mitigating strategies are designed to address an extended loss of ac power condition (ELAP):
  - This condition is a more severe (or bounding) version of a sec. 50.63 event
  - At the plant implementation level this results in a direct link between the mitigating strategies and the current SBO requirements (via the emergency operating procedures)
  - Proper integration of the mitigating strategies requirements into the current regulations results in the need to amend sec. 50.63 (at least to add a link to new requirements)
- Regarding the Impact of Recommendation 7 regulatory activities:
  - EA-12-051 was issued to require SFP level instrumentation
  - The SFP level instrumentation requirements supports the SFP mitigating strategies
  - SFP strategies involve the use of self-powered portable pumps
  - Existing spray capabilities (required by sec. 50.54(hh)(2)) will also be used
  - The current approach (implementing EA-12-049 and EA-12-051) addresses many elements in NTF Recommendation 7 and is readily addressed in implementing guidance that would be part of this rulemaking



# Applicability/ELAP Overview

- Requirements would apply to all power reactor licensees and designs (Part 50 and Part 52)
  - EA-12-049 was imposed on current licensees and Vogtle Units 3 and 4
  - An equivalent license conditions was imposed on VC Summer Units 3 and 4
- Requirements would be structured around a defined condition: ELAP
- Mitigation of the ELAP condition (see next slide) is the forcing function for establishing strategies, guidance, and relied upon equipment
- ELAP is essentially an onsite condition that provides a practical means for addressing a range of beyond design basis external events

# ELAP Definition

- ELAP condition is based on the following assumptions:
  - Complete loss of ac power to the essential and nonessential switchgear busses
  - Loss of offsite power that results in a reactor trip and concurrent turbine trip
  - Unavailability and non-recoverability of onsite emergency ac power sources and offsite ac power sources continuing beyond the sec. 50.63 specified duration
  - Unavailability and non-recoverability of a sec. 50.63 alternate ac power source (if relied upon to meet sec. 50.63 requirements)
  - ac power is available from inverters fed by safety-related batteries
  - If requirements are put in place by this rulemaking to allow for a “supplemental ac power source” – then this source would be available to restore power
  - Portable mitigating strategies equipment can be used to maintain/restore functions
- EA-12-049 requires contingencies if the conditions are more severe than these assumptions

# ELAP Definition Cont'

- Loss of normal access to the ultimate heat sink
  - ELAP condition results in the unavailability of all ac powered pumps which typically leads to a loss of normal access to the ultimate heat sink
  - The draft regulatory basis views the loss of normal access to the ultimate heat sink as a consequence of ELAP – not as a separate condition
- For passive plant designs (ultimate heat sink is the atmosphere) the loss of normal access to the normal heat sink may challenge long term core cooling, containment, and SFP cooling capabilities, therefore special provisions may be needed for such plants

# Mitigating Strategies

- Mitigating strategies requirements would follow an approach similar to EA-12-049:
  - Develop, implement, and maintain guidance and strategies to maintain/restore core cooling, containment, and SFP cooling capabilities
  - Guidance and strategies would be required to be adapted for all modes
  - Equipment would be required to be of sufficient design and capacity considering the nominal conditions expected
  - Mitigating strategies must be required to consider contingencies
  - The strategies would be required to be integrated into existing station blackout procedures
  - The strategies would be required to accommodate the use of offsite assistance and resources including consideration of damage to transportation infrastructure
  - The regulatory framework would integrate with NNTF Recommendation 8 rulemaking requirements

# Design Requirements

- Design requirements for equipment:
  - Equipment must be design to perform functions relied upon for ELAP mitigation
  - Portable equipment would be independent of installed SSCs
  - Portable equipment must be designed, stored, and protected to minimize common mode and common cause failure
  - Portable equipment would need to be protected from the effects of beyond design basis external events
  - Portable equipment would be designed, staged, and deployed to minimize potential damage or impairment to installed safety-related equipment
  - There needs to be sufficient sets of portable equipment to enable maintenance and testing
  - Design should enable periodic testing and inspection
  - A test program needs to be established to provide assurance of continued functionality

# Supplemental AC Power Source

- Supplemental ac power source is a potential new design flexibility:
  - Supplemental ac power source must be electrically independent from emergency ac power sources
  - Supplemental ac power source may need to be diverse from current emergency ac power sources
  - Supplemental ac power source would be required to be physically located to minimize common cause failure from external events (dependent on nature and magnitude of the external events applicable to the site)
  - Supplemental ac power source(s) would need to have a combined capacity and capability to operate equipment necessary to maintain or restore core cooling, containment, and spent fuel pool cooling following a beyond design basis external event, for all units on a site
  - Supplemental ac power source would be required to supply power through physically and electrically separate pathways to multiple distribution systems or motor control centers that in turn provide power to the equipment important for core cooling, containment, and SFP cooling
  - Supplemental ac power source would be designed for, protected from external events to a margin  $\geq$  supplied equipment (at least one train of equipment)
  - Supplemental ac power source would need to be designed to interact with connected SSCs

# Change Control

- Recognizing the “adequate protection” pedigree of these requirements change control appears to be appropriate to control the configuration of the strategies, guidance and equipment relied upon over time
- Current change control requirements would be applied but sec. 50.59 would not be effective for changes to the strategies, guidance, and equipment given the beyond design basis nature of the events
- Straight-forward concept - ensure that changes continue to meet the new requirements or otherwise follow the sec. 50.90 amendment process and obtain prior NRC review and approval

# Link to 10 CFR 50.63

- Mitigation of ELAP is linked into the current plant procedures in the emergency operating procedures applicable to a loss of all ac condition (i.e., the station blackout EOP)
- This results in a direct linkage between mitigating strategies and current station blackout procedures
- Linking these requirements (sec. 50.63 and the new sec. 50.xxx) aligns the regulatory framework with implementation
- Current concept is to amend sec. 50.63 to indicate that if a station blackout exceeds the specified duration (including the failure of an alternate ac power source) then the mitigating strategies are to be implemented
- Note there is a question (appendix) requesting stakeholder's views on whether an integrated rule should be pursued (e.g., new mitigating strategies + sec. 50.63+ sec. 50.54(hh)(2))



# Implementation

- This portion of the regulatory basis recognizes the implementation of EA-12-049 and its impact on the rule
- Objective is to avoid implementation challenges between the rule and EA-12-049:
  - Note that the revised rulemaking schedule was intended, in part to facilitate this objective (i.e., final rule now due in December 2016 to the Commission)
- Most of this portion of the basis document addresses the Part 52 licensing regimes which essentially simplifies to requiring a licensee to implement these requirements before initial fuel load
- NRC will use its cumulative effects of regulations (CER) process during the final rule stage (2016 time frame) and make any appropriate adjustments to the rule implementation provisions if CER challenges exist

# Questions

- NRC is using this opportunity to gather additional stakeholder input
- This input helps with efforts to draft proposed rule provisions within the framework outlined in the preceding draft rule concepts portion of the document (i.e., performance-based framework)
- The draft regulatory basis contains additional questions:
  - Should the NRC consider a broader, more integrated rule combining sec 50.54(hh)(2) + sec. 50.63 + new 50.xxx requirements?
  - New reactors have superior designs, external events design bases/siting, and benefit from decades of operating experience from current reactors and as such stakeholder feedback is requested on application of station blackout mitigation strategies to new reactors
  - How should human reliability be considered for these extreme scenarios ?
  - Impacts/costs : Feedback is requested to support NRC's regulatory analysis for the proposed rule

# Next Steps

- Comment period for the draft regulatory basis ends  
May 28, 2013
- Staff will consider all feedback and revise the regulatory basis accordingly
- We are required to provide a note to the Commission on the regulatory basis in early July
- Following that it is our plan to move forward to proposed rule stage
- We plan to interact with ACRS on the proposed rule (2014) and final rule (2016)
- We recognize the interest and are open to continued interaction with this committee on this rulemaking