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609th Meeting

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1	UNITED STATES OF AMERICA
2	NUCLEAR REGULATORY COMMISSION
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4	609TH MEETING
5	ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
6	(ACRS)
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8	THURSDAY
9	NOVEMBER 7, 2013
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11	ROCKVILLE, MARYLAND
12	+ + + +
13	The Advisory Committee met at the
14	Nuclear Regulatory Commission, Two White Flint
15	North, Room T2B1, 11545 Rockville Pike, at 8:30
16	a.m., J. Sam Armijo, Chairman, presiding.
17	COMMITTEE MEMBERS:
18	J. SAM ARMIJO, Chairman
19	JOHN W. STETKAR, Vice Chairman
20	HAROLD B. RAY, Member-at-Large
21	RONALD G. BALLINGER, Member
22	SANJOY BANERJEE, Member
23	DENNIS C. BLEY, Member
24	CHARLES H. BROWN, JR. Member
25	MICHAEL L. CORRADINI, Member
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1	DANA A. POWERS, Member	
2	JOY REMPE, Member	
3	PETER RICCARDELLA, Member	
4	MICHAEL T. RYAN, Member	
5	STEPHEN P. SCHULTZ, Member	
6	GORDON R. SKILLMAN, Member	
7		
8	DESIGNATED FEDERAL OFFICIAL:	
9	GIRIJA S. SHUKLA	
10	MICHAEL SNODDERLY	
11		
12	ALSO PRESENT:	
13	EDWIN M. HACKETT, Executive Director, ACRS	
14	GORDON ARENT, TVA	
15	BIFF BRADLEY, NEI	
16	MARK CARUSO, NRO	
17	WILLIAM CROUCH, TVA	
18	STEVEN DINSMORE, NRR	
19	JEANNE DION, NRR	
20	DANIEL DOYLE, NRR	
21	MARY DROUIN, RES	
22	RICHARD DUDLEY, NRR	
23	ROBERT HAAG, Region II	
24	SHANA HELTON, NRR	
25	STEVE HILMES, TVA	

		3
1	RAY HRUBY, JR., TVA	
2	FRANK KOONTZ, TVA	
3	GEARY MIZUNO, OGC	
4	JOHN MONNINGER, NRR	
5	JUSTIN POOLE, NRR	
6	STEVE SMITH, TVA	
7		
8	*Present via telephone	
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1	T-A-B-L-E O-F C-O-N-T-E-N-T-S
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19	Enhanced Regulatory Framework
20	Stephen Schultz
21	Shana Helton
22	Richard Dudley
23	Mary Drouin
24	Dan Doyle
25	Richard Dudley

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

8:31 a.m.

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CHAIRMAN ARMIJO: The meeting will now come to order. This is the first day of the 609th meeting of the Advisory Committee on Reactor Safequards. During today's meeting the Committee will consider the following: Safety evaluation associated with the Watts Bar Unit 2 operating license; Near-Term Task Force Recommendation 1: Enhanced regulatory framework; assessment of the quality of selected NRC research programs; draft report of the biennial ACRS the NRC Safety Research Program; and review of finally, preparation of ACRS reports.

This meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act. Mr. Girija Shukla is the designated federal official for the initial portion of the meeting.

We have received no written comments or requests to make oral statements from members of the public regarding today's sessions.

There will be a phone bridge line. To preclude interruption of the meeting, the phone will be placed in a listen-in mode during the presentations and Committee discussion.

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

The first briefing will be on Watts Bar, and Mr. Harold Ray will lead us through that discussion. Harold?

RAY: Thank you, Mr. MEMBER-AT-LARGE As you indicated that I'm going to elaborate a bit more than usual here, we are meeting at this time to discuss the current status of the construction, inspection and activities related to Watts Bar Unit 2 operating license application. This is a Part 50 application. For those of us who have been mired in Part 52 for the past several years, we need to shift our thinking a little bit, there important but are many considerations that I'll get to here in a second.

This application was submitted on March 4th, 2009 and this meeting is intended to result in an Interim Committee letter to reflect the Committee's review to this point. An important fact for us to keep in mind is that Unit 2 is the second unit of a dual-unit plant and it has a Westinghouse nuclear

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1 steam supply system and an ice condenser. 2 We had our first Subcommittee meeting on 3 this application in March of 2009 and we've had 10 4 Subcommittee meetings since that time. The first ACRS 5 letter though dealing with Watts Bar 1 and 2, as a dual-unit plant, was in 1981, the operating license 6 7 application 31 years ago. It's not highly relevant 8 today, but it is a fact that that's when the ACRS 9 first took up Units 1 and 2 as a dual-unit plant 10 facility and wrote а letter commenting on acceptability at that time. Subsequently the -- did 11 12 I calculate wrong, Mr. Corradini? MEMBER CORRADINI: No. 13 14 (Laughter.) 15 MEMBER-AT-LARGE RAY: Okay. I thought 16 maybe you were --17 PARTICIPANT: He was counting his fingers. (Laughter.) 18 19 MEMBER-AT-LARGE RAY: All right. I'm --20 CHAIRMAN ARMIJO: Did he take off his 21 shoes? 22 MEMBER-AT-LARGE RAY: I'm known to do 23 24 So in any event, subsequently we wrote another letter on the Unit 1 operating license and Unit 1 then 25

subsequently did enter service in February of 1996.

As it stands now, Unit 2 is projected to enter service almost 20 years later. And for that reason, I started up a dual-unit plant long ago and we only had one ACRS meeting. The important thing I'm trying to get to is we're having a second meeting and it's for the Unit 2 operating license, but that's not I don't think a usual course of events. We had just one meeting for both of the dual-units that I'm referring to.

We're having this meeting because of the length of time that has passed. The plant was in The construction permit was extended deferred status. in 2000 and work has been ongoing basically for -well, longer than when the Subcommittee began its But in any event, the Commission, recognizing that this was different than what had been done before for dual-units where the units were a year or two apart in their start-up, issued a staff requirements memorandum which has guided, and I believe Mr. Monninger will affirm that the staff review and certainly the Committee's review has attempted to adhere to the guidance in that staff requirements memorandum. And it's quite specific that in essence with minor adjustment we are looking at this as if

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there hadn't been this lapse of time but paying attention to what affects the lapse of time they have had on the plant.

So the current licensing basis of Unit 1 is the licensing basis for Unit 2. And in that respect this is somewhat like a license renewal, at least I think of that way sometimes, because the licensing basis isn't in play, at least not as far as the staff requirements memorandum is concerned. Our review and the staff's review follows that guidance.

There are a couple of nuances we'll probably touch on here having to do with the opportunity that may exist to address some generic items on Unit 2 before it goes into operation and that that would be advantageous if we did that and we monitor the status of those decisions that are made. But with that, I'll leave it aside further.

So this is an unusual review because it's Part 50. Many of us haven't done a Part 50 licensing here in this room for a long time, and but more significantly it is preceded by the licensing of Unit 1 which operates today under its license condition, and those conditions apply to Unit 2 by direction of the Commission.

With that, those are the main things I

wanted to say, other than I guess I should say also we currently project a final letter next year, perhaps mid-year, and it was just because of this long time, as I said, we've had 10 Subcommittee meetings, one at the site, that the staff, we agreed we should write this interim letter. So we're not closing out anything here now. We're just trying to be as accurate as we can in our review today. With that, John?

MR. MONNINGER: Good morning. I'm John Monninger. I'm the deputy director of the NRR's Division of Operating Reactor Licensing. The staff and myself are pleased to meet with you today to discuss the status of our review of the license application and also the status of inspection of construction activities at the site.

In addition to the service that the ACRS provides to the Commission, to the Commissioners in providing independent recommendations, we the staff also place considerable value in our interactions with the ACRS and we take great pride in our interactions in the line of questioning. We view it as a very important milestone in our projects. And so this meeting and the series of meetings we've had in the past and hopefully the final one next year is a very

important milestone for us.

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As Chairman Ray mentioned, we are adhering to the Commission's guidance in 2007-2008 to use essentially the same licensing basis for Unit 2, as was approved for Unit 1. There are some nuances associated with that, but broadly speaking that is the framework that we are following.

I think given the history of the Watts Bar the construction permit, the original site with construction permit being issued in 1973 and several significant delays in licensing and construction over the years, I think a fair and important question is where is the staff today regarding the potential for a licensing decision for Watts Bar Unit 2 in the near We have a high level of confidence that the remaining issues are on track and TVA has been very responsive to the staff's request for information and we have had very fruitful technical dialogues. result, we have a high level of confidence that within the next year we will provide a recommendation to the Commission on whether a license should be issued. Part of that is the interactions with the ACRS and we believe we are in a good stated to be prepared for all our interactions with the ACRS.

Significant progress has been made in

licensing and construction, as you will hear today. Recently we placed significant more focused internally within NRR and within the region and resources on this project and we'll continue the application additional resources as needed to support development of the recommendation for the Commission next fall. In the end the decision is with the Commission, but you and the staff are an important part of that process.

With that said, there are always challenges to any project, long poles in the tents or project vulnerabilities. We do have them, as we will discuss some today. Some of those include the hydrology review, the closure of the Fukushima lessons learned orders, and the waste confidence rulemaking. We believe we are on the same staff's path forward on those, but they do represent challenges to us.

With that said, you know, I just wanted to turn it over then to Justin Poole, who is our senior project manager for the project, and we do look forward to a fruitful discussion with you this morning.

MEMBER-AT-LARGE RAY: John, could I, before Justin takes over, make one comment that occurs to me based on what you said? I think that one of the

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1 things that we and I'm sure the staff are interested in; more than interested, but focused on is the fact 2 3 that this unit shares systems and is immediately 4 adjacent to an operating unit, and therefore it isn't 5 in my mind just how are we doing on Unit 2, but what 6 we're doing on Unit 2. How does it have the potential 7 to affect safe operation of Unit 1 as well? 8 So I don't want to lose sight of that. 9 There maybe questions perhaps of TVA about that, but 10 in looking at the materials that we have here, I just want to add that to the mix. This is a plant that's 11 very closely integrated with an operating unit. 12 has been done before, so it's not a unique situation 13 14 in that regard, but it is a matter of interest. Okay? 15 So with that, I quess from MR. MONNINGER: 16 the region we do have the branch chief here today, and 17 so I would punt that for his discussion. And to me it would seem like there's two potential areas. 18 19 putting the appropriate focus licensee continued safe operation of Unit 1? And the other 20 aspect will be is are there any potential negative 21 implications with the various construction activities 22 occurring on Unit 2 that could impact Unit 1? 23 24 MEMBER-AT-LARGE RAY: The start-up We discussed this at some length at the 25 activities.

1	site visit four years. I'm just saying
2	MR. MONNINGER: Okay.
3	MEMBER-AT-LARGE RAY: it needs to be
4	kept on the table now. What is going to be the status
5	of Unit 1 during certain important evolutions that
6	Unit 2 will take in its start-up testing and coming on
7	line?
8	MR. MONNINGER: All right. Thank you.
9	MEMBER-AT-LARGE RAY: Okay.
LO	MR. POOLE: Great. Good morning. My name
L1	is Justin Poole. As John said, I am the senior
L2	project manager in the Office of Nuclear Reactor
L3	Regulation, Division of Operating Reactor Licensing
L4	assigned to the Watts Bar Unit 2 operating license
L5	application review.
L6	Besides John here with me today is, as he
L7	pointed out, Bob Haag, the branch chief in the
L8	Division of Construction Projects in Region II, and
L9	Jeanne Dion, who is another project manager in dual,
20	as well as other staff in the audience to answer some
21	questions.
22	The purpose of this meeting, as Mr. Ray
23	pointed out, is for the staff and TVA, the applicant,
24	to discuss with the Full Committee the reviews that

the staff has performed to date on the operating

license application for Watts Bar Unit 2. Also as Mr. Ray mentioned, per a memo of understanding between the staff and ACRS, the staff is requesting an interim memo based on the review that has been performed to date. As I will discuss later in the presentation, the staff will be coming before the Full Committee at a later date when the safety review for the project has been completed.

I would now just like to run through the agenda for the meeting real quick. The agenda for today's presentation, as seen in the slide in front of you, TVA will start with an overview of the project followed by a discussion on licensing, and finally talk about the differences between Units 1 and 2. Following TVA's presentation the NRC staff will make its presentation on its review of the application and construction activities. This will include a brief overview on the background, the scope of the staff's the staff's review date, review, to remaining activities for future Committee meetings, and finally the inspection program and the status of inspections.

If there are no further opening questions,

I'll now turn it over to Ray Hruby from TVA.

MEMBER-AT-LARGE RAY: I'm not sure exactly where it is, but until we all get our microphones

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adjusted to the right position, we've got to be careful in order to minimize the background noise that we create.

Good morning, Ray.

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MR. HRUBY: Good morning. TVA appreciates this opportunity to discuss the Watts Bar 2 completion project with the Advisory Committee on Reactor Safeguards.

For today's meeting we'll be following the agenda provided on slide 2. My name is Ray Hruby. I'll be providing the update on the construction completion status. Gordon Arent to my left will be providing the status on the licensing status. also be providing some discussion on some technical topics. Those will be presented by Mr. Frank Koontz and Bill Crouch from our engineering organization. And then following these presentations I'll providing some brief closing comments and then our team will be prepared to answer any additional questions the Committee may have.

This portion of the presentation will provide the current status of the Watts Bar 2 completion project. The following areas will be discussed: First I'll cover the guiding principles that govern the execution of the Watts Bar 2

completion project. Next I'll cover the current status of the project from a safety, quality, cost and schedule perspective. I'll also discuss some of the major milestones and talk about some of our accomplishments to date. I'll conclude with a brief discussion of the project critical path schedule.

The quiding principles for construction completion are on slide 4. Our top priority is and always will be to ensure that the public health and safety is protected at all times. We do this by ensuring that the conduct of construction and testing activities are performed in a manner that results in the safe, continued, uninterrupted operation of Watts Bar Unit 1. We're always mindful of anything that we do through construction, testing or start-up that could affect the operating unit. We also are careful to maintain fidelity of Unit 1 and Unit 2 design and licensing basis, and also the physical operation and committed maintaining to а consistent, predictable, transparent process for completing the project and also the licensing.

The Watts Bar 2 completion project remains on track with the estimate to complete that was performed in early 2012. Our safety performance continues to be good. We're nearly at 23 million

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hours without а lost time accident, and for construction project with the number of people and the activities that we have going on at Watts Bar, that is very good performance in the construction industry. Our reportable injury rate for the last fiscal year up being at 0.33, which is top performance for a construction site.

We're also really pushing a safety conscious work environment. We go out and make sure that we get the message out routinely encouraging the workers to raise safety concerns or quality concerns when they occur or when the workers have them so that the organization can resolve them in a timely manner. We also are performing pretty well with project quality, and we measure this by the first time quality control acceptance rates. And right now we're over 97 percent of quality acceptance.

schedule performance and Our costs continue to meet expectations in that we remain within our authorized budget and we're slightly ahead of the Just to refresh everyone, we did commit to schedule. the TVA board of directors to load fuel for Watts Bar Unit 2 by June of 2015. That's our most likely date based on the estimate to complete that was performed. targeting a much more The project however is

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1 aggressive fuel load date and right we're now 2 targeting January of 2015. 3 MEMBER-AT-LARGE RAY: Ray, there was some 4 reports; I don't know anything about it except what I 5 read in the newspaper, so to speak, about commercial dedication issues. Those all behind you from your 6 7 standpoint? 8 MR. HRUBY: Yes, we had some issues with 9 our commercial dedication process. We did work 10 through those. We either retested or evaluated the items that were commercially dedicated and we believe 11 that that's been resolved. 12 MEMBER-AT-LARGE RAY: Does it make any 13 14 change in your QA Program? 15 MR. HRUBY: No. 16 MEMBER SKILLMAN: Ray, when you say you 17 are moving aggressively to load fuel earlier than mid-2015, what are you doing that may be compromising 18 19 quality or safety to achieve that? 20 That's a good question, Dick. MR. HRUBY: And we're doing nothing that compromises quality and 21 I think that the metrics that I talked about 22 safety. indicate that safety and quality will always be our 23 24 top priorities. We are not taking any steps to

shortcut that. What we're doing is we have a very

detailed critical path schedule that I'll talk about a little bit later with very specific milestones. And what we're doing is we're looking for efficiencies in the execution, the sequencing of the work to ensure that the work is done correctly the first time with high quality. Because if we can't do it safely and with high quality, then we'll have to do it over, which will just delay the schedule. So to us the two go hand-in-hand. You have to have good safety and good quality to have the ability to achieve a schedule.

MEMBER SKILLMAN: Thank you.

MR. HRUBY: Okay. Next I want to talk about some of the milestones that we've achieved. We have released this calendar year a service air system to operations. The project is currently focused on open vessel testing and there are seven safety-related systems required to be able to accomplish that milestone. The five systems that are listed there have already been turned over to start-up for testing. They were construction-complete through the course of this year and they're in start-up testing now.

We do have two remaining systems: chemical and volume control and safety injection. Those are scheduled to be completed later this month and then

1 turned over to start-up by early December. And those remain on track. And as I mentioned in the answer to 2 3 the previous question, the project team has developed a detailed fully-integrated project schedule and a 4 5 critical path schedule to complete the project, and we're executing that schedule. 6 7 MEMBER SKILLMAN: Ray, for the system 62 8 and 63 CVCS and SI you've made clear and the NRC staff 9 has made clear that the design basis of the two plants 10 is the same design basis. Have any changes been made to CVCS or SI in light of Fukushima that enhance 11 flexibility or that change what was the original 12 design of those two systems? 13 MR. HRUBY: I can't think of any at this 14 15 moment. 16 MEMBER SKILLMAN: Thank you. 17 MR. HRUBY: We are going to talk about the, you know, bypasses, cross-connects, 18 19 doodads here and there that increase flexibility yet at the same time introduce an unsuspected flow path or 20 an unsuspected challenge, any physical modifications 21 to the original design basis for those two system. 22 MR. KOONTZ: This is Frank Koontz. 23 24 think what we can say is that the original design

basis has been pretty much kept intact for those two

systems, however, we do have over and above that an effort underway on Fukushima, and Gordon will talk about that a little bit, but that adds all kind of capabilities for separate injection points. And what we're trying to do is maintain even fidelity on that between the two units. So Unit 2 is handling the Fukushima issues for both units and we're trying to keep both units the same while providing flexibility for temporary pumps, intermediate pumps, you know, feed water system, injection points and things like that. That's exactly my point: MEMBER SKILLMAN: Those nifty flexibility things that you just added introduce risks and vulnerabilities that may not have been fully evaluated. MR. KOONTZ: Right. MEMBER SKILLMAN: That's why I'm asking the question. MR. KOONTZ: I understand. And we have want to be very careful with that. And what we've done at Watts Bar is we've involved our NSSS partner, and they're one of the major players in making those Fukushima changes so that we can look at the original design basis and looking at what we're doing to add

that capability and make sure we don't conflict.

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MEMBER SKILLMAN: Thank you.

Okay. Next slide. This slide MR. HRUBY: major milestones along depicts the the project completion and critical path to fuel load. it's a little difficult to read on the screen, we've provided larger copies of this slide for you to take a look at. And again, underlying this critical path milestone depiction is a very detailed critical path schedule. We used Primavera P3 to schedule it, and it has, you know, tens of thousands of activities in that schedule. So there's a great deal of detail, both in construction start-up activities and underneath this schedule.

I want to highlight some of the key milestones on this chart. Those have been depicted in bold diamonds along the main path of the critical path are open vessel testing. Right now it is targeted for May of 2014 followed by cold hydrostatic testing that's scheduled for June of 2014. Hot functional testing is scheduled for October of 2014. And then at the far right emergency safeguards testing right now is scheduled for January of 2015, followed shortly by us being prepared to load fuel in January of 2015.

MEMBER-AT-LARGE RAY: When we, as I mentioned earlier to John, reviewed similar schedules

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status of Unit 1 being off line or in refueling or 2 3 Those don't show on this, as I see it 4 anyway. Those ties still exist, I assume? 5 MR. HRUBY: Yes, in fact Unit 1 has a refueling outage that's scheduled for March of 2014 to 6 The Unit 1 are Unit 2 teams are working very 7 8 closely together to ensure that any activities that 9 need to be conducted while both units are shut down can be accomplished. And also the Fukushima tie-ins 10 that we referred to earlier can also be made during 11 that time period. So there is close coordination. 12 The site executive leadership right now is over both 13 14 Unit 1 and Unit 2, so we have more of an integrated 15 organization than what you may have seen before. 16 MEMBER-AT-LARGE RAY: Yes, that was part 17 the discussion was, well, what if th Unit 1 schedule changes and then -- I won't go into that. 18 19 That's past history. But anyway, the upshot of it is you're managing both units as you would in a dual-unit 20 start-up of any other plant? 21 Absolutely. Absolutely. 22 MR. HRUBY: Are there any questions for me at this point? 23 24 MEMBER SCHULTZ: What is the rough length of the outage? Don't go into details you don't feel 25

at the sight visit, there were specific ties to the

1	comfortable commercially, but what's the length of the
2	outage for Unit 1 and how is it affected by Unit 2
3	activities?
4	MR. HRUBY: Actually the Unit 1 outage
5	will not be affected by any Unit 2 activities, so the
6	activities that Unit 2 has to do will not impact that
7	schedule. And I don't know the exact number of days.
8	MEMBER SCHULTZ: That's fine then. Thank
9	you.
10	MR. HRUBY: Okay.
11	MR. POOLE: It's about 40 days.
12	MEMBER SCHULTZ: Thank you.
13	MR. HRUBY: Any other questions before I
14	turn it over to Gordon?
15	(No audible response.)
16	MR. HRUBY: Okay. With that, Gordon
17	Arent's going to talk about licensing.
18	MR. ARENT: Thanks, Ray. I am Gordon
19	Arent. I'm the licensing manager for Watts Bar. What
20	I'd like to do this morning is just take you through
21	a little bit of the history; we've heard some of it
22	from both Dr. Ray and also from John this morning, and
23	then walk you through what we've accomplished to date,
24	our alignment to the SECY that was written in 2007,
25	and then what things remain to be completed for Watts
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Bar Unit 2.

The first slide, slide 9, gives you the higher-level background. We based this on when we received the license for Watts Bar Unit 1. So in November of 1995 Watts Bar Unit 1 was issued a low-power license and then subsequent to that in February of 1996 Watts Bar Unit 1 was issued a full-power license. And at that time, while there was a conclusion that of course Unit 1 met all the required requirements and guidance that was in place at the time, there were no conclusions stated for Watts Bar Unit 2.

By letter dated July 14th of 2000, TVA did inform the NRC that Watts Bar Unit 2 met the definition for a deferred plant in accordance with Generic Letter 87-15. So when we began to look at the Watts Bar 2 completion project, or the likelihood of the Watts Bar 2 completion project, we were beginning from the deferred plant status.

April 3rd, 2007 TVA submitted a key assumptions letter for completing Watts Bar Unit 2. It's important to recognize that when we did stop construction on Watts Bar Unit 2, it was substantially complete in about the 1985 time frame. There were two key assumptions that we discussed with the staff at

1 the time in April that would guide us going forward with the completion of Watts Bar Unit 2. 2 3 First off, clearly we intended to complete 4 the project under 10 CFR 50. That's how Unit 1 had 5 been licensed and for consistency and 6 regulatory perspective it made sense to license under 10 CFR Part 50. 7 The second key assumption was is that we 8 9 would rely on the docketed record for Watts Bar Unit 10 1 and that docketed record for issues that had already been resolved on Watts Bar Unit 2 for moving forward. 11 20 SSERs, or supplemental safety 12 there were evaluation reports, in place at the time that we began 13 14 construction on Watts Bar Unit 2. 15 We also looked at all of the generic 16 communications that were related or affected --17 MEMBER-AT-LARGE RAY: Excuse me, Gordon. MR. ARENT: Yes? 18 19 MEMBER-AT-LARGE RAY: Would it be fair to say you resumed construction rather than you began 20 construction? 21 Yes, we resumed construction. 22 MR. ARENT: MEMBER-AT-LARGE RAY: 23 24 MR. ARENT: That's a good comment. We did look at the generic communications, 25

generic letters, circulars, both, and we looked at all of those dispositions, all of those through licensing of Watts Bar Unit 1, and we've gone forward with all those that have been issued since 2007 when we began the project again. And then based on the unique history of Watts Bar there were a series of what was called CAP, Corrective Action Program, and Special Program issues. There were 29 of those. They were part of the Nuclear Performance Plan, and we did address all of those as part of the resumption of Watts Bar Unit 2. Those issues were discussed with the staff in the April and in subsequent meetings of And then in July 2007 the Commission issued SECY 07-0096, which was the guiding document and staff's recommendations approved the and the Commission's considerations for the completion of Watts Bar Unit 2.

Next slide, please. So the attributes of the SECY 07-0096 which established the licensing approach for Watts Bar Unit 2 are as follows: First, we're going to license again Watts Bar Unit 2 in accordance with 10 CFR 50. Secondly, the licensing basis for Watts Bar Unit 1 would be the reference basis for Watts Bar Unit 2. NRC staff should review exemptions, reliefs and other actions that were

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specifically granted for Unit 1 to determine whether or not those were applicable to Watts Bar Unit 2. Significant changes in the licensing approach would be allowed and driven by the backfit rule, if The staff should encourage the license appropriate. to adopt updated standards for Unit 2 where it would significantly detract from the design operational consistencies between Unit 1 and Unit 2. And then finally, there were generic safety issues at the time that would be easily or more easily addressed with an un-irradiated unit versus having a unit that had power at some point and we should look at those for addressing while we were in an un-irradiated state.

There were also two additional conditions.

One was that we should offer a notice for opportunity for a hearing. That was done when we issued the proposed license application. There was an opportunity for a hearing provided at that time. And then if there were any issues with respect to moving from a deferred plant status to a construction status, which there were not.

Next slide. So the previous slide basically laid out the staff's approach and the Commission's approval of that approach. This slide

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basically discusses our application of the SECY at Watts Bar Unit 2. So clearly we did follow 10 CFR 50 in its entirety with respect to licensing Watts Bar Unit 2. We have used the Watts Bar Unit 2 to design the licensing basis as the reference basis for completion of Watts Bar Unit 2.

There are exceptions, however. There have been obsolescence issues. So there have been specific equipment issues on Watts Bar Unit 2 where we have not been able to replace equipment. That's the same on Unit 1. So we've evaluated that and we've addressed that to make sure that from an operational standpoint that equipment will still function in a manner that the operators are familiar with, so it's consistent with the operational approach to Watts Bar Unit 1. However, that equipment may be different. And we'll talk a little bit about that as we move forward.

The other area is is there were known improvements that we were going to make as part of completion of Watts Bar Unit 2. A couple of examples of those were from an Appendix R standpoint we reevaluated operator manual actions and we also reevaluated the spurious shorts issues to address those. We'll present also those a little bit later on.

1	With respect to relief requests, we did
2	evaluate relief requests used on Watts Bar Unit 2. To
3	date we've adopted about 10 on Watts Bar Unit 2. Most
4	of those had to do with ASME Code cases and not a lot
5	of additional ones. We are looking or did look at a
6	couple during start-up testing where we took
7	exceptions, and those have been reviewed by the staff.
8	There are four pending that remain to be reviewed by
9	the staff.
10	MEMBER-AT-LARGE RAY: Gordon, again at the
11	site visit; I recall Charlie brought my attention here
12	yesterday, there are occasions, are there not, in Unit
13	1 where you've modified or replaced I&C equipment or
14	whatever to make it consistent with what is now
15	available and installed on Unit 2? That at least
16	MR. ARENT: That is correct?
17	MEMBER-AT-LARGE RAY: was the position
18	then, and I assume it's still the same.
19	MR. ARENT: Right. In some cases for the
20	control system upgrades that we performed earlier on
21	Unit 2, Unit 1 has followed behind us and applied the
22	same upgrades.
23	MEMBER BROWN: Does that apply for the
24	protection? You made the same comment in the earlier
25	meetings relative to the protection system, the Eagle-

1	21 for ops lessons and components.
2	MR. ARENT: We've got Steve Hilmes here
3	from our I&C group, so he can
4	MEMBER BROWN: Well, I was going to wait
5	until your next slide before I
6	(Laughter.)
7	MR. ARENT: Well, you've asked it, so
8	Steve
9	MEMBER BROWN: Harold preempted me here.
10	So my question was
11	MEMBER-AT-LARGE RAY: The microphone right
12	here. And be sure and introduce yourself, please.
13	MEMBER BROWN: A two-part question: Okay.
14	One was we had a meeting back in 2009 where you all
15	gave us that initial introduction of what you intended
16	to do.
17	MEMBER-AT-LARGE RAY: Right.
18	MEMBER BROWN: That the Eagle-21 system
19	was going to be carried forward and the major changes,
20	if any, were only for obsolescence of components. The
21	architecture and structure of that design would remain
22	the same.
23	MEMBER-AT-LARGE RAY: Right.
24	MEMBER BROWN: So my question was is that
25	I presume that's still in play? I haven't seen

1	anything in subsequent meetings that changes that.
2	MEMBER-AT-LARGE RAY: And before you
3	answer, let me say there is a presentation still on
4	the list to be made to us on this subject.
5	MEMBER BROWN: Well, I've already forward
6	and it's
7	MEMBER-AT-LARGE RAY: No, I don't mean
8	today. I mean it's on the list of things
9	MEMBER BROWN: Oh, a future
10	MEMBER-AT-LARGE RAY: open items to be
11	presented to us.
12	MR. ARENT: That's correct. There's an
13	SSER open item that we
14	MEMBER-AT-LARGE RAY: It's not today.
15	MR. ARENT: have to
16	MEMBER BROWN: Well, I thought that was on
17	the open item. I thought that was on two-way
18	communications.
19	MR. ARENT: That is correct.
20	MEMBER BROWN: Not the reactor protection
21	system.
22	MEMBER-AT-LARGE RAY: Okay. Then I'm
23	mistaken then.
24	MEMBER BROWN: Okay. So anyway, is that
25	still operative? It's kind of a yes or no.

1	(Laughter.)
2	MR. HILMES: Steve Hilmes, Electrical and
3	I&C. Yes, that is
4	(Laughter.)
5	MEMBER BROWN: Okay. And the second part
6	was; I think you answered this already; I just want to
7	make sure, that those changes in the RPS system, not
8	just non-safety-related systems; I'll look back at
9	some of the slides from 2011, where you made some non-
10	safety stuff, stuff would be backfitted control
11	systems, back into the Watts Bar 1. And I'm presuming
12	because of the statements made in 2009 that the same
13	would apply to the protection system and safeguard
14	systems. Would those be for the obsolescence issues?
15	Would those be I don't want to call it backfitted;
16	that's the wrong word, but used to make Unit 1 more
17	compatible in terms of the complements and cards with
18	Unit 2?
19	MR. HILMES: The safeguards and protection
20	system are basically identical between the two units
21	with, you know, exceptions as we discussed as obsolete
22	cards. But even those cards are fully swappable
23	between
24	MEMBER BROWN: Okay.
25	MR. HILMES: units.
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1	MEMBER BROWN: All right. So they're
2	compatible back and forth? You could take one of the
3	old ones and stick it in WB2 if you had to
4	MR. HILMES: This is
5	MEMBER BROWN: if you had a problem and
6	needed to do that?
7	MR. HILMES: That is correct.
8	MEMBER BROWN: Okay. All right. Okay.
9	Second: One of the diagrams in your 2011 one. This
10	is relative to control of access. Some people always
11	refer to this as cyber security, but control of access
12	from the external world to the internal plant. You
13	had a figure with a giant electronic diode shown very
14	prominent in the middle of the thing and it was
15	referred to as a data diode. And in our discussions
16	at that time you commented that that was a hardware-
17	based-only data diode with no software functionality
18	in it. And I just wanted to ask if, as you've
19	proceeded forward the next two-and-a-half years, that
20	stayed the same.
21	MR. HILMES: That is still the case, yes.
22	MEMBER BROWN: Okay. All right. I'm
23	done. Thank you, Harold.
24	MR. ARENT: All right. The next bullet
25	was the backfit rule. The backfit rule has not been

applied at Watts Bar Unit 2 as part of the construction project to date. The next area was new standards were determined to be applicable. adopted a number of new standards. This is an example of the emergency planning rule, the cyber security rule, which we just talked some about, and of course Fukushima. So those standards are all being applied to Watts Bar Unit 2 and there are some additional ones in addition to that. And then the final area was again the opportunity for improvements where in an unirradiated state it made sense to do that.

So on the next slide, slide 12, there's a list of improvements that we made. It's not an exhaustive list, but it's a list of some of the more major improvements that we've made. Some of the areas gained from an un-irradiated perspective was the containment sump performance We have addressed those. The staff is doing their final review of our approach on that and the implementation of our program. We have replaced the reactor quide tube support pins, commonly known as And we've also addressed the reactor split pins. coolant system and pressurizer weld issue by using the mechanical stress improvement process. So those have all been done while the unit has been un-irradiated.

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1	We've also done, as I mentioned earlier,
2	quite a bit of work on Appendix R. We've addressed
3	both operator manual actions and multiple spurious
4	operations. And then again there's quite a list here
5	of additional improvements that we've made.
6	CHAIRMAN ARMIJO: A couple of questions,
7	one on your material replacement for FAC corrosion.
8	MR. ARENT: Yes?
9	CHAIRMAN ARMIJO: Basically did you just
10	move to chromoly steels?
11	MR. ARENT: Yes.
12	CHAIRMAN ARMIJO: Okay. The other
13	question was the zinc injection system for Unit 2, is
14	it the same as on Unit 1?
15	MR. KOONTZ: This is Frank Koontz. Yes,
16	it is. What we did on Unit 1 is around the time of
17	the replacement steam generators we decided to go with
18	passivation by zinc. And so we installed a small
19	system to do that through the CVCS system and we're
20	duplicating that on Unit 2, and Westinghouse has
21	provided analysis for that.
22	CHAIRMAN ARMIJO: Okay. Thank you.
23	MEMBER RICCARDELLA: Excuse me. You
24	mentioned the mechanical stress improvement that's
25	presumed through just the Alloy 600 issues.

1	MR. ARENT: Yes.
2	MEMBER RICCARDELLA: But there's also been
3	issues with the top head and the pressurizer heater
4	sleeves, things like that. Have you done anything to
5	address those?
6	MR. ARENT: The top head and the heater
7	sleeves?
8	MEMBER-AT-LARGE RAY: Well, make sure you
9	speak up well enough
10	MR. ARENT: I'm sorry.
11	MEMBER-AT-LARGE RAY: that it can be
12	picked up.
13	MR. KOONTZ: This is Frank Koontz again.
14	On the top head what they've done is they've gone in
15	and they've looked at the welds associated with that
16	and done the UT exams and everything that's needed
17	there. And for the what was the second one, the
18	MEMBER RICCARDELLA: Pressurizer
19	MR. KOONTZ: pressurizer heater
20	sleeves?
21	MEMBER RICCARDELLA: Right.
22	MR. KOONTZ: I think what Westinghouse
23	showed was that if the heaters fail, they tend to
24	swell up and then rupture. We haven't looked at the
25	sleeves themselves, but we do have knowledge that the

1	heaters are all good and that they haven't usually
2	they fail first and then they rupture later. And that
3	we know those are good, so we haven't got to that
4	point where we need to do anything on those. We do
5	have to do we have replaced one heater I think in
6	the past, and we have to re-hydro the pressurizer
7	because of that.
8	MEMBER RICCARDELLA: But you're talking
9	Unit 1 or Unit 2?
10	MR. KOONTZ: Unit 2.
11	MEMBER RICCARDELLA: So but, yes, and I
12	mean the UT on the top head you haven't had any
13	service yet.
14	MR. KOONTZ: That's correct.
15	MEMBER RICCARDELLA: I mean if cracking
16	occurs in service I mean there are mitigative
17	actions that might be more convenient to take before
18	it's irradiated.
19	MR. KOONTZ: Yes, we've looked at some of
20	the mitigations that they can do on that, but I think
21	as a project we chose just to do the exams at this
22	point. And we haven't seen any issues on Unit 1.
23	MEMBER RICCARDELLA: Is it a low-
24	temperature head?
25	MR. KOONTZ: A T cold head.

1 MEMBER RICCARDELLA: A T cold head? Okay. 2 So you've got 20 years or so? 3 MR. KOONTZ: Right. Right. 4 VICE CHAIR STETKAR: Gordon? 5 MR. ARENT: Yes, sir? VICE CHAIR STETKAR: I don't want to dwell 6 7 on it, because I know the PRA -- you know, that's sort 8 of what i like, but PRA is not part of the licensing basis here. 9 10 (Laughter.) VICE CHAIR STETKAR: However, you had the 11 12 bullet down there, so you gave me an opening. don't want to talk about -- you said Reg Guide 1.200-13 14 compliant PRA. I don't want to ask about the PRA itself, but we had a little discussion earlier that 15 16 triggered a question in my mind. 17 Because of the extensive shared systems Unit 1 and 2, specifically the support 18 19 systems, ERCW, CCW, power, and so forth, has Unit 1 adopted any risk-informed licensing applications that, 20 you know, use the Unit 1 PRA or use -- I'll call it 21 the Unit 1 PRA in a way that has not fully accounted 22 for the functions that are necessary to support Unit 23 24 In other words, if the Unit 1 PRA was assuming

that all four ERCW or all five power become ERCW pumps

-- I'm sorry, ERCW are available to support Unit 1, that's no longer the case. And if any risk-informed licensing decisions for Unit 1 were based on that presumption, has TVA looked at any of those issues to see whether some of -- you know, if there are risk-informed licensing applications; and I don't know whether there are, whether they could be affected by re-scoping the PRA to better account for the supported Unit 2? That's sort of the Unit 1/Unit 2 issues that is, you know, quite a bit more subtle than pumps and physical connections.

MR. KOONTZ: Well, this is Frank Koontz again, and what we did when we did the Unit 2 PRA, we didn't just do the Unit 2 PRA, we went back and looked at Unit 1 and Unit 2 at the same time.

VICE CHAIR STETKAR: Yes.

MR. KOONTZ: We updated those models pretty extensively. We went from RISKMAN to CAFTA and re-looked at the types of things that might be impacted. One of the examples I think that you're thinking about, for example, would be the diesel generator allowed outage time. And on Unit 1 we had a 14-day diesel generator allowed outage time based on risk-informed licensing changes. We know that goes away when we start Unit 2 and will be reapplying with

1	the new models. And I don't think we'll get 14 days
2	back, because we don't have all those common systems
3	available just for Unit 1.
4	VICE CHAIR STETKAR: But you haven't
5	MR. KOONTZ: We haven't done that yet, but
6	we think we'll get additional time than the standard,
7	but not the full
8	VICE CHAIR STETKAR: But not the full?
9	MR. KOONTZ: 14 days.
10	VICE CHAIR STETKAR: Okay.
11	MR. KOONTZ: So we are
12	VICE CHAIR STETKAR: So it's not
13	MS. KOONTZ: We're looking it and we've
14	got plans to address it.
15	VICE CHAIR STETKAR: Thank you.
16	MEMBER-AT-LARGE RAY: John, would you like
17	to add that to the open items that
18	MR. MONNINGER: No.
19	MEMBER-AT-LARGE RAY: we have yet to
20	MR. MONNINGER: You said we're going to
21	MEMBER-AT-LARGE RAY: You don't?
22	CHAIRMAN ARMIJO: I had just a quick
23	question
24	MR. MONNINGER: We're on the record.
25	CHAIRMAN ARMIJO: on the insulation.
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1 Did you have fibrous insulation that you had 2 replace? So you don't have a --MR. KOONTZ: 3 Well, this is Frank Koontz 4 aqain. I'll address that in a later slide, but on our 5 sump what we found was that problematic insulation in Unit 1 was a Min-K insulation, which is the thermal 6 7 blanket-type stuff. And we had used that in Unit 1 to 8 protect hot pipes from conduits and things like that 9 in limited situations. And they also had a EM fire wrap which was a -- M20C is the model number, but it's 10 like a stainless steel sheath with a mat behind it. 11 That caused us problems on Unit 1 to where we had to 12 eliminate a lot of that insulation. So on Unit 2 we 13 14 made it the rule don't put any fibrous insulation 15 inside containment. So we don't have any NUCON. 16 We're a reflective-metal insulation plant. 17 CHAIRMAN ARMIJO: Right. MR. KOONTZ: And we've banned 3M and we've 18 19 banned the Min-K. CHAIRMAN ARMIJO: Good. The other 20 question I had is on the main condenser re-tubing. 21 Was that done to make it the same as Unit 1? Was Unit 22 1's condenser re-tubed? 23 24 MR. KOONTZ: Yes, Unit 1's condenser was 25 re-tubed at Ι think a second cycle or third,

1	somewhere. And there we learned on Unit 2 to go ahead
2	and do that. In fact, we had taken some of the tubes
3	out of Unit 2 to practice the re-tube for Unit 1,
4	because we did Unit 1 during an outage. So we had
5	removed some tubes over there just to get practice on
6	it. So we basically had to re-tube the condenser.
7	And one of the things we were trying to do was
8	eliminate copper from the secondary site, because
9	that's a bad actor on our steam generators. So we
LO	wanted to get that out before we ever started Unit 2
L1	up. We re-tubed the condenser completely and
L2	CHAIRMAN ARMIJO: So you went to stainless
L3	steel or titanium?
L4	MR. KOONTZ: Titanium?
L5	MR. CROUCH: In fact we went to SEA-CURE
L6	stainless steel.
L7	MR. KOONTZ: Yes.
L8	CHAIRMAN ARMIJO: Yes. Okay.
L9	MEMBER BALLINGER: So both units are SEA-
20	CURE?
21	MR. CROUCH: Yes.
22	MEMBER-AT-LARGE RAY: Just a time check.
23	We're at the time when this portion is supposed to
24	end, but please continue.
25	(Laughter.)

1 MEMBER BALLINGER: Well, a question on the 2 split pins. What's the material? MR. KOONTZ: 3 I don't recall the material 4 for the split pins. We can find that out if we have 5 to. MR. CROUCH: We'll have to get back to you 6 7 on that. It is the same material 8 MR. KOONTZ: Yes. that's used on Unit 1. I do know we did the same 9 10 thing, based on the material cladding. MR. ARENT: Okay. Slide 13, Bill? 11 Licensing path forward, just a status. 12 Thanks. final environmental statement has been completed. 13 14 There open Watts Bar Unit 2 specific are no 15 against the environmental statement. contentions 16 There is the generic waste confidence contention that 17 remains open for all plants that are in similar license conditions as we are. 18 19 Supplemental safety evaluation reports, 22 through 26 have been issued. The safety evaluation 20 report open items are about 99 percent complete. 21 still have a number of what I would call confirmatory 22 action items that need to be done that will follow 23 24 actual physical completion of certain systems in the There are about 10 items that we still owe the 25 plant.

staff final confirmation on.

And then we are working on the closure of regulatory commitments. We started out with about 1,600 regulatory commitments. We have about 500 left and we're moving more aggressively to get those closed.

Next slide, slide 14. This is very difficult to read, or impossible to read up here, but there is a nice suitable for framing picture of it.

Briefly I wanted to walk through this. What this really shows is the integrated schedule for final licensing of Watts Bar Unit 2. The top swim lane or that darkish blue color, that is the traditional licensing path. That takes through the ACRS meetings, ASLB, if that still remains to be an issue, and the closure of the open items that remain.

The second swim lane represents Fukushima.

And for Watts Bar Unit 2 specifically we are required to have the Fukushima orders completed prior to licensing, so that would be the mitigating strategies and the spent fuel pool instrumentation orders.

The third area, or the yellow area on the chart, that is actually the integration of our transition from a single unit of operation to dual-unit operation. So that's department readiness. It's

training for departments other than operations. It's all the administrative things that have to go into place to allow us to operate two units and to make sure that the staff is ready to do that.

The lighter blue area near the bottom, that's the operator licensing area. The operators will be afforded dual-unit license for Watts Bar Unit 1 and Unit 2. We have aligned with Region II and are in the process going forward to support that. And we will in fact have sufficient operators to be able to operate two units at the time we're ready to license Watts Bar Unit 2.

The final line item at the bottom is waste confidence. And today we are in the saddle with the staff working through the generic response to the waste confidence rule and we're playing close attention to that. And that is, as I think John mentioned earlier, one of our challenges for licensing Watts Bar Unit 2. If there's a delay in that process, if there are significant challenges as part of the draft rule and public comment period, then we'll be looking at that in a lot more detail and looking at alternatives.

MR. HRUBY: And this is Ray Hruby. Again underlying this drawing is a very detailed schedule

1 for all the different licensing activities in swim lanes and they all result in the support of a January 2 3 2015 fuel load currently. MEMBER-AT-LARGE RAY: Other questions of 4 5 TVA? (No audible response.) 6 7 MR. ARENT: Okay. If there are no other 8 questions, I will turn it over to Frank Koontz and he 9 will walk us through the additional technical topics. 10 MR. KOONTZ: Thank you, Gordon. these technical topics we've already gone over a 11 little bit, so I'll be brief on those, but these are 12 various things that we thought the ACRS might be 13 14 interested in with respect to Unit 2 completion. 15 First, the goal was to minimize 16 physical difference between the plant and maximize 17 unit fidelity, and that was per the staff requirements memorandum. 18 19 There are some physical differences and operational differences that we will start up with. 20 The first one on the slide there that's noted is no 21 tritium production. 22 And what that means is that you may be aware on Unit 1 we have installed tritium-23 24 producing burnable observer rods for the Department of

Energy and we make supplemental tritium for their

1	purposes. We will not be doing that at the start-up
2	of Unit 2, so there's no TP bars in Unit 2.
3	We will start up with the original steam
4	generators. Those are the Westinghouse model D3 steam
5	generators. On Unit 1 we got about 10 years, 10
6	calendar years of service out of those generators and
7	then we replaced them with a model 68AXP. So what we
8	decided on Unit 2 was to go ahead and start up with
9	those generators, and we've done a number of things
10	for eddy current testing and foreign object search and
11	retrieval to remove any loose parts. And we believe
12	those generators are in good condition; should give us
13	similar service life.
14	CHAIRMAN ARMIJO: What is that material?
15	Is it 600 thermally-treated?
16	MR. KOONTZ: Yes.
17	CHAIRMAN ARMIJO: But not
18	MEMBER BALLINGER: Thermally-treated or
19	mill-annealed?
20	MR. KOONTZ: That I don't know.
21	MEMBER BALLINGER: Thermally-treated or
22	mill-annealed? LA-600 tubing.
23	MR. KOONTZ: We can find that out. Doug
24	would know.
25	CHAIRMAN ARMIJO: Does replacing the steam
J	I and the state of

1	generators require a whole new containment or
2	MR. KOONTZ: Yes.
3	CHAIRMAN ARMIJO: Okay.
4	MR. KOONTZ: Yes, what we've done on Unit
5	1 is we cut a hole in the top of the containment and
6	cut out the dog house top and then we pulled the old
7	generators out and dropped the new ones in. Basically
8	the 68AXP is dimensionally the same size on the
9	outside, but it does provide an upgrade capability.
10	The tubes have longer length inside the generator and
11	the moisture separators are slightly smaller. So you
12	do get better performance out of the new steam
13	generators, and that's probably what we'll eventually
14	go to on Unit 2 when the time comes.
15	MEMBER BALLINGER: So the new steam
16	generators in Unit 1 are thermally-treated 600?
17	MR. KOONTZ: There again we'd have to
18	verify the tube materials for you. But we can find
19	that out.
20	MEMBER-AT-LARGE RAY: Yes, let's just do
21	that.
22	MR. KOONTZ: We'll follow up and get your
23	answer.
24	One of the other issues is we will start
25	up with the same power level that we started Unit 1,

which was 3411 megawatts thermal and we will not be using the feedwater flow measurement uncertainty recovery, and that's commonly known as LEFM, leading edge flow meter. We do have that hardware installed on Unit 2, but we're not going to license it or use it at start-up. We may apply for that license after the first cycle, after everything is running okay. And that would give us about a 1.4 percent power upgrade. That's what we saw in Unit 1. It's currently running on Unit 1 and has been for some time.

Emergency core cooling system sump mods.

We talked about this. We're reflective-metal insulation. Our lesson learned was to prohibit the fiber in containment and we eliminated the 3M fire wrap and the Min-K insulation.

In the area of equipment replacement, again we've talked about some of these. Our inadequate core cooling monitor was an old platform. based on it 8086 technology, was microprocessors. We've converted that to a Common platform with Westinghouse. And that's an additional platform, but it serves inadequate core cooling monitoring. It serves the reactor vessel level instrumentation system. The core exit thermal couples go through there and TSAP monitoring, and it

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replaces that. And the staff had numerous reviews of that digital system to make sure they were satisfied with that.

For core flux monitoring, Unit 1 still has the old traversing probes that move in and out to take flux measurements inside the reactor. This was an opportunity for improvement that we saw in Unit 2 and we've installed the Westinghouse WINCISE system, and what it has is fixed probes within the core with several detectors down the probe. At the tip of the probe it has the core exit thermal couple. So that did a couple things for us: It eliminated the topdown inserted-core exit thermocouples and it provided a real time flux distribution in the core to use a Beacon software system to read out those probes and tell what the flux is inside the core. So that was an improvement for us.

In the area of digital instrument and control upgrades, we had talked about that a little bit. The non-safety NSS stuff was replaced. It serves boron, pressurizer pressure control, rod control, steam dump. We also went to digital feedwater controls, and we will be implementing those same mods over on Unit 1. So they're trying to copy us because they see that as a benefit also.

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And the turbine and moisture separator heater upgrades, what we did there is we upgraded the high-pressure turbine, the low-pressure turbine. We went with larger moisture separator reheaters. And this was all done basically for efficiency and reliability. What we think we'll get out of that is around a 38-megawatt electric improvement with the same NSSS power output. So that was an event that --

Bill, next slide? Some of the analysis topics we came across was thermal conductivity was fairly recent for us, and this is a generic industry. Of course you're aware of what happens there is the NRC staff was concerned that they had some research that indicated the fuel pellet thermal conductivity changed as a function of burnup; in fact it got worse, and that the vendor codes for fuel rod performance didn't account for those changes in thermal conductivity.

For Westinghouse it happens to be a PAD code, P-A-D, and we had been using PAD 4.0 to do the safety analysis for Unit 1 and 2. The Westinghouse Owners' Group undertook a project. They developed some bounding models for various groups of plants. We decided since we were a near-term operating licensed plant that what we needed to do was go in and do a

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1	Unit 2-specific analysis. So Westinghouse modified a
2	version of PAD to explicitly account for thermal
3	conductivity degradation. They got the results of
4	that. It impacts the most for a large break LOCA. We
5	submitted that analysis to the staff and it's under
6	their review at this point in time. Just for
7	interest, it mad about a 214-degree difference and our
8	peak clad temperature went up. So it does have an
9	impact.
LO	CHAIRMAN ARMIJO: But you still had good
L1	margins?
L2	MR. KOONTZ: Yes, and that's the next
L3	bullet down. The large break LOCA and small break
L4	LOCA still have large margins to the PCT limit of
L5	2,200. Currently for large break LOCA we're sitting
L6	at 1,711 Fahrenheit and for small break LOCA we're at
L7	1,184, so quite a ways away from 2,220.
L8	MEMBER BANERJEE: This is with a
L9	degraded
20	MR. KOONTZ: That's with a degraded model
21	in place accounting for the thermal conductivity
22	degradation. Yes, before that we were down around
23	1,552, in that area, so it did go up.
24	MEMBER-AT-LARGE RAY: Let me see if I can
25	get this right. I think this is the item 61 you're

1	talking about that we will again
2	MR. KOONTZ: Yes.
3	MEMBER-AT-LARGE RAY: be discussing.
4	MR. KOONTZ: Yes, like I said, the staff,
5	we haven't seen their final review yet, so it's under
6	review at this point in time.
7	MEMBER BANERJEE: What was the fuel model
8	you used here?
9	MR. KOONTZ: You mean the type of fuel we
10	have in the core or
11	MEMBER BANERJEE: No, no, no, I mean for
12	the PAD.
13	MR. KOONTZ: ASTRUM. PAD is the fuel
14	MEMBER BANERJEE: Yes, but PAD in its
15	a sort of interim version.
16	MR. KOONTZ: An interim version, yes.
17	Westinghouse just recently submitted PAD 5.0 for the
18	staff to review.
19	MEMBER BANERJEE: Yes, for approval.
20	MR. KOONTZ: Right, for approval. And
21	what they used for us was one that they have used for
22	some other plants that were in
23	MEMBER BANERJEE: Yes.
24	MR. KOONTZ: life extension.
25	MEMBER BANERJEE: Yes, I know that, right.

Okay.

MR. KOONTZ: So it was the same as that. PAD 4.0+ is what we call it.

Slide 18. These are some topics that came up during the Chapter 15 reviews. We went through Chapter 15 very thoroughly with the NSSS vendor. Some of the issues that came up, for example, overpressure protection on second safety-related trip. When we did the Unit 1 analysis, there were two trips we looked at. There was an anticipatory reactor trip on turbine trip. This was for a loss of load event. And then a high-pressurizer pressure trip. Well, on Unit 1 we tripped the reactor on the high-pressure pressurizer trip.

The staff pointed out that the way the -what they wanted to see was it was to be tripped on
the second safety-related trip, and the anticipatory
trip is a non-safety-related trip. So we did that.
We went in and we looked at it, not on the
anticipatory trip. We ignored the high-pressurizer
pressure trip. And the next trip that occurs is an
overtemperature delta T trip that's about 4.5 seconds
later. We ran that and we still met all the
acceptance criteria, so the staff was satisfied. But
that was the little difference between how we did the

two calculations.

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Chemical volume and control malfunction. For Unit 1 we have done an inadvertent ECCS analysis, but we had done a CVCS malfunction analysis. We considered that bounded. The staff pointed out that the Reg Guide 1.70, Rev 2 really mentions that you need to have a CVCS malfunction. we did that calculation. That maximizes charging. assumes the let down is isolated. There was no reactor trip. And what you're looking for is to see if you can take operator action before the pressurizer And we were able to show that we'd have overfills. time for the operators to take action. So that was satisfied.

line break Main steam parameter sensitivity study. As the main steam like break core response analysis has evolved between Unit 1 and Unit 2, some of the reactivity coefficients have changed as they've changed things in their fuel models. resulted in two analyses being inconsistent in the One was the loss of off-site power trip with off-site accident and one was one available. We ended up resolving ultimately that with the staff by running both analyses with consistent parameter inputs and they were happy that everything

was working the way it should.

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Additional analyses, inadvertent ECCS.

For the Unit 1 calculation we focused on the safety valves. The staff had issued an RIS back in 2005 that said, gee, you need to worry about the pores because if the pores open up and they stick open, that could cause it to move from a condition 2 event to a small LOCA, which is a condition 3 event. So we re-ran that analysis and were able to show that the pores would not be challenged for Watts Bar Unit 2 with operator action. And that satisfied the staff.

Boron precipitation. The main thing there is to reconfirm the hot leg switchover time for longterm cooling. We were able to do that. We have chosen to minimize problems that we will keep the same boron concentration in the accumulators, in the ice condenser and in the RWST that we have on Unit 1. we wanted to keep those parameters the same even though really those concentrations are driven by the TP Bar Program in Unit 1. It's higher than you would normally expect, around 3,300 parts per million instead of down in the 2000s. So what we did there is we re-ran it, confirmed that a three-hour hot leg switchover time was applicable to both units. And the staff was satisfied with that. So we had more margin

1	on Unit 2 to that.
2	Boron dilution in modes 3, 4 and 5.
3	Previously we had looked at modes 1, 2 and 6 for boron
4	dilution. Again Reg Guide 1.70, Rev 2 indicated, gee,
5	you ought to look at the intermediate modes. So we
6	re-ran the analysis for hot standby, hot shutdown,
7	cold shutdown and we were able to demonstrate that
8	we'd had sufficient operator action time to handle
9	those events.
10	Any questions on the calculations?
11	(No audible response.)
12	MR. ARENT: Next topic we're going to talk
13	about is Appendix R/fire protection, and Bill Crouch
14	will go through those slides.
15	MR. CROUCH: Good morning. I'm Bill
16	Crouch. I'm a mechanical nuclear engineering manager
17	for TVA.
18	The Appendix R/fire protection, we had a
19	single unit fire protection report in Revision 5 that
20	was issued to support single unit operation back in
21	the mid-'90s. And it demonstrated that we complied
22	with Appendix R Sections III.G on fire safe shutdown,
23	III.J on emergency lighting, III.L on off and
24	shutdown, and III.O for the oil collection system.

NRC's review is documented in a couple of

different SSERs, 18 and 19. The fire protection report has been revised over the years using our provisions in accordance with Generic Letter 86-10. And at the time we resumed construction on Unit 2, it was at Revision 39. So that was our starting point for where we began. The NRC's review of the dual-unit fire protection report is documented in SSER 26.

When we started the dual-unit report our objective was to expand the existing report, just like we talked about for all these other aspects. We wanted to maintain consistency with the single unit, but we also needed to do two things: We needed to expand the report to encompass the fact that you're now doing dual-unit operation as opposed to two single units sitting side-by-side and we also planned to incorporate all the Unit 1 upgrades that we knew were coming, and we'll talk about that a little later on.

As I said, we started with Revision 39.

We went into the Appendix R models. We incorporated the Unit 2-specific equipment such as the classic fire protection aspects of detection, suppression, separation, etcetera. And then we went into the fire safe shutdown analysis. By doing this you have to go and know the location of your equipment, the location of the cables. You feed them into interactive

databases that determine if the equipment is affected by fires in specific locations. And if it is, then you have to address it by either redesigning your plant or doing various resolutions to either protect the cables. Prior to operator manual actions there's various things you can do to make your safe shutdown analysis acceptable.

We've also incorporated the upgrades, like I said. We've addressed multiple spurious operations using the PWR Owners' Group generic scenarios. There's approximately 54 scenarios we went through and evaluated. WE used the evaluation that was done originally for Watts Bar Unit 1 as our starting point. We also went and got the evaluations for Sequoyah Unit 1 and 2 to ensure we incorporated the dual-unit aspects into our evaluation.

For operator manual action reductions we went in and performed modifications in order to reduce the number of short-term local operator manual actions. By local we mean operator actions outside the control room. And so once again we performed cable reroutes, added switches, etcetera, in order to be able to perform actions inside the main control room or eliminate the action entirely.

One of the other things we did was we

evaluated all the local operator manual actions for feasibility and reliability for Unit 2 and common actions using the requirements of Reg Guide 1.189, Rev 2. By doing this you go through and you look at the timing of the action, the fire loading in the area, the paths, etcetera, in order to demonstrate that not only can the action be done in the required time, but there is enough margin to the time that it can be done reliably considering the fact that the operator may have to stop to do something along the way and cannot get to the action absolutely immediately. So we do all those evaluations to demonstrate that the Unit 2 and common actions are both feasible and reliable.

VICE CHAIR STETKAR: Bill, just -- and I'm trying to be mindful of the time here, we had quite a bit of discussion over that last topic in our June Subcommittee meeting. In particular it seems that your feasibility and timing analyses at that time seemed to be rather optimistic. You said you did walk-downs, but the walk-downs seemed to start from time zero when everybody was assembled in the control room, briefed and given the procedures. And then you started the stopwatch to see how long it took to look to walk from point A to point B. Have you redone any of those?

1	MR. CROUCH: The walk-downs for Unit 2
2	have not been done yet.
3	VICE CHAIR STETKAR: Well, no, the whole
4	feasibility analyses. Because it's not just the walk-
5	down. It's from the time when the fire occurs, is
6	known until the operator performs the action. So
7	there's an alert time. There's an assembly time.
8	There's a communication time that your analyses seem
9	to not account for.
10	MR. CROUCH: The Appendix R event fire
11	protection report has defined the time when the
12	operator or shift manager declares an Appendix R
13	event. A small fire in the plant is not necessarily
14	an Appendix R event. And so all of our analyses are
15	based upon time equals zero is when the shift manager
16	SRO declares the Appendix R event.
17	VICE CHAIR STETKAR: Harold?
18	MEMBER-AT-LARGE RAY: Yes, sir?
19	VICE CHAIR STETKAR: But a bullet down for
20	this.
21	MEMBER-AT-LARGE RAY: All right.
22	VICE CHAIR STETKAR: Thank you.
23	MEMBER-AT-LARGE RAY: Girija?
24	MR. SHUKLA: Yes?
25	VICE CHAIR STETKAR: I wanted to have this
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1 discussion before I got back to you. MEMBER-AT-LARGE RAY: Yes, I understand. 2 3 We've grossly mismanaged the time allocation here. 4 (Laughter.) 5 MEMBER-AT-LARGE RAY: And we're way behind But this is all information that I think is 6 7 appropriate, so please proceed. CROUCH: Any other questions on 8 9 Appendix R before we proceed on to another topic? 10 (No audible response.) MR. CROUCH: Another topic I want to talk 11 about is what we refer to as refurbishment. 12 talked about earlier, Watts Bar Unit 2 construction 13 14 was begun and we deferred the plant for a number of 15 years and then we resumed it. So in order to make sure that we've addressed this time period where the 16 17 plant basically sitting without active was construction going on, have implemented this 18 we 19 program which we refer to as refurbishment to go and make sure that the equipment of safety-related and 20 non-quality-related would be able to perform its 21 functions when we get ready to operate the plant. 22 We've gone through and we've divided the 23 24 scope up in terms of both active and passive.

active components; things like valves that have to

open and close, pumps that run, they're being addressed by disassembling, obviously opening and closing valves, those kinds of things to happen to make sure that the valve is actually working properly, the pump is turning properly, etcetera.

But that doesn't ensure that your passive aspects are working properly. So we have a separate type of program to go in and actually inspect the interior piping and inspect passive features such as concrete supports, etcetera, items that just sit there. This is very similar to license renewal-type process, and we use the requirements of the license renewal GALL as part of our input to develop our program.

So as part of this, our process steps, we go through and identify the scope of the equipment that's involved. We utilize various drawings. We go in and look at how the system is arranged, either the mechanical system or electrical-type system. We pick out the representative areas. Obviously we did not want to have to go and inspect every inch of every pipe, so we picked representative areas where we thought we'd be most likely to find problems such as low spots in pipes, closed valves where we might have water trapped, etcetera.

We went in and did inspections any time 1 2 you open up the system. We had people go in and do 3 borescopes in both directions to make sure that the 4 piping was in good condition. We had people that went 5 out and looked at the pipe supports, people who looked at the concrete, etcetera. If any problems were 6 7 identified, we addressed them. You would either clean them out, refurbish them, replace parts, whatever was 8 9 needed in order to make the item work. The eventual 10 demonstration that the component is working properly will be the component and system testing. 11 required outcome of this program is we're going to 12 ensure that the plant is able to meet its licensing 13 14 basis design and equipment vendor specifications when 15 we get ready to start it up. 16 Any questions? MEMBER-AT-LARGE RAY: 17 TVA was its own architect engineer when the plant was designed and 18 19 construction up until the time of the deferral. now have an outside architect engineer? 20 MR. CROUCH: That is correct, with TVA 21 providing the oversight. 22 So in closing, TVA has 23 MR. HRUBY: 24 appreciated this opportunity to discuss Watts Bar 2

completion with the ACRS. And pending any further

1	questions for us, that concludes our presentation.
2	MEMBER-AT-LARGE RAY: Thank you. I've
3	said a couple of times we ran way over. It seems to
4	me that it's our scheduling that's at fault here. But
5	in any event, you'll be around until the completion of
6	this session if we need to come back to you with
7	anything else?
8	MR. HRUBY: That's correct.
9	MEMBER-AT-LARGE RAY: We'll go to the
LO	region now, if we can.
L1	I think the region begins with negative
L2	two minutes on the schedule.
L3	(Laughter.)
L4	MEMBER-AT-LARGE RAY: We'll be considerate
L5	of that fact that we've put you in this position.
L6	MR. POOLE: Actually we had kind of built
L7	your slide presentation to have the NRR portion go
L8	first. Then the region was going to finish up.
L9	MEMBER-AT-LARGE RAY: Just another problem
20	with our scheduling.
21	MR. POOLE: And, but still, you know, I
22	think, you know, TVA hit all that stuff that we
23	already had in our program, so I think I'll be skip
24	over some of the slides, or at least talk about them
25	at a very high level.

MEMBER-AT-LARGE RAY: Yes, please, where possible don't repeat things that we've heard.

MR. POOLE: Excellent. So the first slide is basically a lot of the information you've already heard before, or Mr. Ray had already mentioned about timelines of when, historical events that happened in the licensing of Unit 1 for the CP, the application of the OL, the shutdown of the construction at the site and then finally the completion of Unit 1. So I can skip over that part.

Let's go to the next slide. Again in the letter dated November 4th, 2006 TVA notified the NRC of its intent to perform the study on the feasibility of completion of Unit 2. In April 2007, as you heard from TVA, they provided their key assumptions letter associated with the possible reactivation of Unit 2, assuming TVA board approval. Based on these letters staff wrote a SECY paper that went up to the Commission and the Commission came down with their SRM, SECY 2007-0096 on July 25 of 2007, which TVA already kind of went through beforehand, so I will not go over all the bullets as I think everybody is familiar with what that says now.

Coming out of the direction from the Commission, the staff took the SRM and issued two

documents to lay out the detailed framework for
completing the licensing review, the first of which or
one of which was NRR Office Instruction LIC-110. It
was created to establish the organizational rules and
responsibilities within NRR. It detailed the process
work flow and the management controls for conducting
the review. It provided guidance on how to coordinate
portions of the review that would be handled by
offices outside of NRR; i.e., NSIR and Research and
NRO. LIC-110 also guides the staff through the
process and leading the issuance of operating license.
So much like we've gotten questions from ACRS during
the Subcommittee meetings and how we went through the
review, the idea of the LIC-110 document was to put
forth the guidelines to the staff so that they know
these are the bounds that they are to work within when
doing their
(Phone ringing back with voice on phone
line.)
MEMBER-AT-LARGE RAY: That does happen
from time to time.
(Voice on phone line.)
MEMBER-AT-LARGE RAY: Just hang on. I
think it was a TVA line that's
MR. POOLE: Okay.

MEMBER-AT-LARGE RAY: -- perceived no longer needed.

MR. POOLE: So again, it was to give them guidance on how they were to perform the review and the bound of which they were to structure their review.

Another document that the staff published was Supplement 21 to NUREG-0847. This provided the staff with a baseline for the remaining evaluation that was required to be done for the licensing review for Watts Bar Unit 2. It lists each section from the previous SER, SSERs and provides a status as issues that were previously whether or not the reviewed remain valid and are therefore considered resolved, or if not, that it will be listed as open and the staff needs to make a determination on these issues. The subsequent SERs still have this table. It's Table 1.7 in the SSER. And as we go through and complete sections that were originally marked as open, we go and mark those as closed out so we have an overall status of where the project sits.

The status of these sections were originally developed as a result of the staff's assessment on the status of the review presented in TVA's framework letters that were submitted in January

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and March of 2008. As well, the staff did a review of those SSERs that were published in support of Unit 1, the original SER and its 20 supplements.

The staff provided its assessment to TVA in May of 2008. And based on the staff's assessment, the TVA updated the framework in June of '08 and then the staff gave its final approval of the assessment in October of '08, which was then transformed into the table that you see in the SSER, the Table 1.7.

Next slide. Regarding the status of the operating license application, when TVA submitted its amendment updating the operating license application, TVA provided the staff with Amendment 92 to the FSAR. TVA created this amendment by taking the FSARs that existed when Watts Bar Unit 1 received its operating license in 1996 and marking it up with differences between that version and the current version of the Watts Bar Unit 1 FSAR at that time, roughly 2008, along with any known Unit 2-specific differences. And those are the differences that you had heard during TVA's presentation.

Since that time TVA has submitted additional amendments, at least for the purposes of this discussion, up to Amendment 109 to provide additional details on the design of Unit 2. The staff

has reviewed this information and documented its findings in a supplement to NUREG-0847, the Safety Evaluation Report related to the operation of the Watts Bar Nuclear Plant Unit 2.

This line shows at a high level in which supplements the review of the different chapters can be found. These publications of an SSER was followed by an ACRS Subcommittee meeting in which the staff presented its finding on specific topics within these sections.

As I mentioned on a previous slide, SSER 21 identified the framework for the review by listing out the sections which were considered complete and which were considered not. SSERs 22-26 provided the staff's technical evaluation on the sections above. Any open items or confirmatory items that the staff generated during its review were documented in Appendix HH of the SSER, which is basically the final pages that you see. Most of these reviews found in the supplemental SSERs are the staff documenting the changes made between Unit 1 and Unit 2 FSAR due to the minor differences between the two units.

There were a few areas where the staff was required to spend a significant amount of time, and we'll go into those now. And a lot of this you had

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1 already heard in detail from TVA, so I'm trying to get 2 us back on schedule here. But the three areas I'd 3 like to highlight are the instrumentation control in 4 Chapter 7, the fire protection report review in 5 Chapter 9.51, and the accident analysis in Chapter 15. As TVA discussed in their presentation, 6 7 there were a number of control systems that were 8 upgraded from what exists in Unit 1 either by choice 9 or by necessity out of being obsolete. Some of these 10 went through in detail in their presentation. On a component level minor changes were 11 12 for the Eagle-21 system, while some were entirely new such as the Common Q PAMS and the WINCISE system. 13 14 MEMBER REMPE: So this WINCISE system, I 15 quess I wasn't around when it was discussed at your 16 Subcommittee meeting. But this is the first time it's 17 being installed as a permanent feature at an operating plant in the U.S.? I guess it was tested at St. 18 19 Lucie, and that's it, right? I don't recall if it was the MR. POOLE: 20 first. 21 Steve Hilmes, TVA electrical 22 MR. HILMES: It is the first time it's being installed in the 23 INC. 24 U.S. There are a number of combustion plants that have a similar system. This is sort of an upgrade of 25

1	that.
2	MEMBER REMPE: As a fixed system in some
3	of the combustion engineering systems?
4	MR. HILMES: Yes, it's very similar to the
5	combustion engineering systems. This is just a more
6	modernized system.
7	MEMBER REMPE: Do you plan to put it back
8	in Unit 1 also eventually, or will you ever?
9	MR. HILMES: Currently we are not planning
10	on installing it in Unit 1. That may be looked at in
11	the future. Due to changes in the head and so forth
12	it's more prohibitive to install it now with the
13	radiation.
14	MEMBER REMPE: Okay. And it has a
15	vanadium emitter, the self-powered neutron detectors?
16	And I missed, did you say how many cycles it can last
17	or
18	MR. HILMES: Frank, do you remember?
19	MR. KOONTZ: (No audible response.)
20	MEMBER REMPE: Is there any concern about
21	depletion of the emitters or
22	MR. HILMES: About what?
23	MEMBER REMPE: Depletion of the emitters
24	eventually. I mean I was looking it up, so I was just
25	curious about it. And they claim it's longer lasting,

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1	but how long?
2	MR. HILMES: Virtually, yes, they'll have
3	to be replaced. They do have a much longer life than
4	the rubidium. Is that the other one?
5	MEMBER REMPE: Rhodium.
6	MR. HILMES: Yes, the old-type fix for us.
7	MEMBER REMPE: But you don't know how many
8	cycles?
9	MR. HILMES: I'll have to get back to you
10	on that.
11	MEMBER REMPE: I'm interested. I'm sorry
12	to interrupt, but I just was curious. Thanks.
13	MR. POOLE: So the NRC staff spent a
14	significant amount of time reviewing all these changes
15	with additional attention paid to the safety-related
16	systems and those with digital components.
17	The staff reviewed its documented; I'm
18	sorry, it's review in SSER 23 and presented its
19	finding to the Subcommittee and has closed out almost
20	all the open items identified closed out almost of
21	the open items it had originally identified and the
22	subsequently SSERs that had been published to date.
23	The next topic was the fire protection
24	report review. Again, as you heard from TVA earlier,

when licensing Unit 1 the staff had reviewed and

1	approved up to Revision 5 of the Watts Bar fire
2	protection report and documented it in SSER 18 and 19.
3	At that time that was the fire protection report that
4	was specific to operation of one unit. Since that
5	time TVA has made changes to the fire protection
6	report under its license condition. During its review
7	of the as-designed fire protection report for a dual-
8	unit operation the staff has reviewed TVA's entire
9	report except for there were Unit 1-specific OMAs that
10	are being still held under the review that was done
11	under SSER 18 and 19 back when licensing of Unit 1.
12	MEMBER-AT-LARGE RAY: John, do you want to
13	elaborate on your new open items?
14	VICE CHAIR STETKAR: No. In the interest
15	of time
16	MEMBER-AT-LARGE RAY: Huh?
17	VICE CHAIR STETKAR: No, not in the
18	interest of time.
19	MEMBER-AT-LARGE RAY: Okay. Well, I want
20	to pick it up in the letter we write.
21	VICE CHAIR STETKAR: Yes. I mean we had
22	some discussion at the Subcommittee meeting that our
23	concern is, as I mentioned earlier, that the timing
24	and feasibility analyses have not been done according
25	to current guidance.
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MR. POOLE: Understood. TVA with the staff encouragement was able to reduce the number of OMAs it relied upon in its plan, which when compared to the Unit 1 fire protection plan, when issued, was

a noticeable improvement.

The NSO review, TVA went through before, was done in accordance with the latest NRC quidance. In addition to these reviews the staff also made an effort to encourage TVA to make changes/improvements to the fire protection report which would make it easier for those in the future to use the plan and understand its licensing basis. This allowed for the staff to write a simpler cleaner safety evaluation from the one that was issued as part of the Unit 1 licensing effort. Some of these efforts included the ability to reduce the level of detail in the safety evaluation on the electrical raceway fire barriers and the fire barrier penetration seals by TVA to amending the following staff quidance.

And additional improvements made to the fire protection report were the Table 1-1, which allows the applicant, the staff and even the region when doing their triennial inspections to quickly understand the basis for the fire protection area which they're looking at and where to look in the fire

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1 protection report to get more specific detailed information on that area. The staff documented its 2 review in SSER 26 and finds it acceptable provided TVA 3 4 completes the confirmatory items that were listed. 5 MEMBER CORRADINI: So just to summarize, 6 John's concern is not your concern? You feel the 7 analysis done is adequate? 8 MR. POOLE: Correct. 9 MEMBER CORRADINI: Okay. Thank you. I'm getting pulled 10 VICE CHAIR STETKAR: We had quite a bit of discussion about this in 11 in. the June Subcommittee meeting, and the staff noted 12 that they had done walk-downs to confirm the times. 13 14 However, their walk-downs started in the control room 15 knowing what they needed to do and they confirmed that it took two minutes to walk from the control room to 16 some other location. 17 In the real world you have some indication 18 19 that a fire happens. You then need to alert the people to go to the control room, because that's their 20 assembly point. These are the operators. 21 They need to find the appropriate fire 22 to be briefed. response procedure for that location. 23 They need to be 24 briefed on what needs to be done. They need to be

And then you start at that time for going

dispatched.

1 to the location so that the actual response times that were measured by the staff walk-downs tend to be a 2 3 small fraction of the total. And there's current 4 There are a couple of NUREGs that have been 5 written on how to do these things. 6 MEMBER CORRADINI: Okay. Thank you. In the Chapter 15, Accident 7 MR. POOLE: 8 Analysis, as you heard from TVA, there were five 9 accident analyses that presented the staff with some challenges, and the staff required the applicant to 10 either reanalyze or provide a new analysis that was 11 not performed as part of the Unit 1 licensing review. 12 And as I said before, TVA went over these in detail in 13 14 their presentation. But basically after a number of back and 15 forth discussions with the staff via RAIs and audits, 16 17 the applicant was able to provide the staff with the information that they needed to perform their review, 18 19 and once presented with these new analyses, the staff review found them to be acceptable and documented its 20 findings in SSER 24 and 26. 21 22 there any question what on presented so far? 23 24 (No audible response.) With that, I will go to 25 MR. POOLE: Okay.

the next slide, which is remaining activities for the licensing review. Everything discussed in the previous slides were the topics where the staff has completed its review and documented the review in the SSER and presented before an ACRS Subcommittee meeting. The next two slides will highlight the remaining activities for licensing review as well as overall project completion.

Currently the next time the staff expects to go before ACRS would be tentatively May 2014 for the Subcommittee and June 2014 for the Full Committee. At that time the staff will have completed and documented its review of the remaining open items and some of the confirmatory items in SSER 27 prior to that Subcommittee meeting. During that Subcommittee meeting the staff intends to present its findings on a specific list of open items that -- which one of the Subcommittee meetings identified to the staff -- actually it was the December 2012 meeting where the Subcommittee identified to the staff which of the open items found in Appendix HH they wished us to present to them once we had closed out our review.

One of these open items, 132, was closed out in an SSER and discussed in the June of 2013 meeting leaving seven remaining open items which I

summarized on this slide. Two of these open items are related to the hydrology review. This was actually a little bit different category in that the staff did provide its evaluation of the hydrology review in Section 2.4 in an SSER presented to the staff -sorry, to the Subcommittee meeting. And there were a number of questions that came out of that review and the staff has gone back with TVA to re-look at that evaluation, and that will be the main component of both the SSER 27 that's published next spring and then the Subcommittee that occurs in early summer. Besides the hydrology review and the other remaining open items, the staff plans to provide a status on the review of the two Fukushima orders relevant to Watts Bar, which are the mitigating strategies order and the fuel pool spent instrumentation order. What happened with the MEMBER BANERJEE: sump screen issues? Well, that's tied into one of MR. POOLE: Open item 59. the open items. That's 59. Essentially the staff now has everything they need to finish their safety evaluation from the applicant.

just got that last piece late this summer, so the

staff is still currently reviewing that and we will

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1 have our review done prior to this SER. 2 MEMBER BANERJEE: So you've finished your 3 screen testing and everything has been submitted? MR. POOLE: 4 Correct. 5 MEMBER BANERJEE: Okay. POOLE: As for overall project 6 MR. completions, I just wanted to highlight a few of the 7 major milestones for the upcoming year. As I just 8 9 talked about, the staff will be meeting with the ACRS in the middle of next year to present its completed 10 Per the orders the action required in the orders 11 SER. must be fully implemented prior to the issuance of the 12 operating license, so that's another milestone that we 13 14 have to complete prior to the issuance of the license. about 15 talked little bit TVA а the 16 environmental review and the status of t.he We do need a letter from ASLB on their 17 contentions. overall decision, and a lot of that will hinge on the 18 19 scheduling of the waste confidence issue. 20 For the Region II to complete its actions and issue its 93-400 letter stating that the plant has 21 built in accordance with the 22 design, operational readiness assessment and the certification 23 24 of as-built construction are required to be complete.

goes well and the staff feels that the

1 applicant has met all the necessary requirements for an operating license, the staff would go before the 2 Commission in the fall of 2014 requesting approval of 3 4 an operating license. 5 That finishes my portion of the presentation. Are there any further questions before 6 we turn it over to the region? 7 8 (No audible response.) 9 MR. HAAG: Good morning. My name is Bob 10 I'm the branch chief in Region II with oversight responsibility for Bar Unit 2 11 Watts construction activities. 12 First slide, please? I want to talk a 13 14 little bit about the inspection program that we have 15 in place for Unit 2. We're using the same programs, 16 the manual chapters that list different inspection 17 procedures that were used for all existing plants that have been licensed under Part 50, and those three main 18 19 manual chapters are: 25-12, which provides the construction inspection procedures; 25-13, which talks 20 about pre-op testing inspections and operational 21 readiness inspections; and then 25-14, the start-up 22 testing inspections. 23 24 Because of the unique history for Unit 2,

we did a similar review as TVA mentioned earlier under

their licensing assessment. And we went back and looked at what other items needed to be added to our plate as far as inspecting Watts Bar Unit 2 to be able to get to a point where we could possibly recommend that they had been built in accordance with their design and all their commitments.

And so we looked at many of the similar things that Gordon had talked about earlier, and we've added to our list of items that we're going to The CAPs and SPs that deal with the historical quality assurance issues back from the initial construction. Generic communications. went through all different generic communications and screened those that we felt were applicable, needed Open items that had not been inspection for Unit 2. closed out that were actually developed during initial construction but hadn't been closed out. We looked at those to find out which ones still had a bearing as far as hardware on SSEs in the plant. Historical allegations. We screened through those issues that has been previously closed, but we looked for any allegations that might have a bearing on the quality of the Unit 2 construction and we pulled a few of those and we're inspecting those.

So when all of that was completed, we

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ended up with 543 unique construction inspection items that we're looking at right now that really develops and embraces our inspection program for Watts Bar Unit 2.

One other aspect I wanted to mention: We went back and looked at the historical inspection record for Unit 2, and we did that because we certainly didn't want to overdo and repeat inspections that had been previously done or we felt were adequate. And an example I like to use is inspections that had been previously completed for concrete structures in the plant. The majority of concrete structures that were already in place at the plant were built during the initial construction and we inspected those. We went and verified that we had satisfied the applicable portions of those inspection procedures for those areas.

And we did them for all of the inspection procedures listed in Manual Chapter 25-12. We called that our reconstitution effort. And what we were able to highlight were those activities that we hadn't completed; and those are clearly in our scope of inspections that we're doing now. And then we also looked at new work that TVA was doing. And even though we completed some of the inspection procedures

1 or felt that they were satisfied, if there was new work being done, we would apply portions of those IPs 2 to the new work such that we weren't ignoring work 3 4 that was taking place currently. 5 MEMBER CORRADINI: So I quess I have a question. 6 This is an area that -- I'm not on the 7 Subcommittee and I'm not very expert. So you looked 8 back as to what you did in 1. You reviewed what --9 MR. HAAG: No, we went back and looked at what did earlier for Unit 2. 10 11 MEMBER CORRADINI: Two. I'm sorry. I apologize. So does this somehow inform 12 how you would do inspections in other parts of Region 13 14 II later on? I'm kind of curious on what you're doing 15 here and how it informs what you'll do in future This isn't directly relevant and 16 construction also. 17 I'm trying to understand --It really has no bearing. 18 MR. HAAG: 19 MEMBER CORRADINI: It has no bearing? MR. HAAG: Well I take that back. 20 insights 21 into how we might look 22 inspections on Bellefonte, if that project occurs. But for the other construction projects that 23 24 are under Part 52, a totally different inspection

There really is very little insights you

program.

could gain from Watts Bar. There may be some, but you know, not that many.

MEMBER CORRADINI: Okay. Thank you.

MR. HAAG: Okay. Next slide? So I just wanted to go over kind of the organization that we have in place for Unit 2 to give you a sense of the amount of commitment that we have for this project. There's a separate branch under the branch chief for that effort that's devoted solely to Unit 2. It's part of the Division of Construction Programs that also have oversight for Part 52 plants and for the fuel facilities.

have four construction resident We inspectors at the site. These are in addition to the resident inspectors for the operating Unit 1 side. the region there's myself. We have a team leader who's involved with overseeing pre-op testing inspections and we have three project inspectors who do mainly the day-to-day processing of just work within the region, issuing inspection reports, dealing with allegations, other items that a project needs to be able to complete its activities and be able to eventually put out and inspection for.

And then to kind of give you a sense of -well, so that's the separate branch we have in the

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1	region devoted to Watts Bar 2. We have regional
2	inspectors who support all construction efforts and
3	they would be, like I mentioned, Part 52 plants, the
4	fuel facilities. So when we went back and looked at
5	to kind of give you a snapshot of the level of
6	effort we counted 32 separate inspectors who had gone
7	to Watts Bar to perform inspections in 2012. Those
8	are in addition to the resident inspectors. So again,
9	that gives you a sense of the amount of effort that
10	we're putting on
11	MEMBER SKILLMAN: Bob, just so it's clear
12	in my mind, it appears from that slide that you've got
13	four resident construction inspectors and three
14	dedicated project inspectors. That's seven almost
15	full time looking at
16	MR. HAAG: And then our team leader. So
17	that's eight inspectors
18	MEMBER SKILLMAN: Okay.
19	MR. HAAG: who are actually qualified
20	inspectors under our current programs
21	MEMBER SKILLMAN: Okay.
22	MR. HAAG: who perform inspections for
23	Watts Bar 2.
24	MEMBER SKILLMAN: Thank you.
25	MEMBER-AT-LARGE RAY: Bob, what's your
	I and the second

1 summary of this commercial dedication issue that was 2 highlighted and I asked TVA about when they were here? Any implications for 3 Is it any lessons learned? 4 anything other than that specific scope that was 5 affected? The commercial-grade dedication 6 MR. HAAG: 7 at Watts Bar 2 was not the first time where 8 identified problems in construction with commercial-9 grade dedication. We've seen it at some of the fuel 10 facilities. So we have seen it during recent construction activities. They did not get to a point 11 where they did at Watts Bar 2 and how we took our 12 enforcement actions for Unit 2. So there are 13 14 implications elsewhere. There were certain 15 implications --16 MEMBER-AT-LARGE RAY: Well I meant elsewhere at Unit 2 --17 MR. HAAG: Yes. 18 19 MEMBER-AT-LARGE RAY: -- going forward. They indicated it made no change in their program. 20 So, okay, that's fine. But I'm just wondering if that 21 22 is what you would say. Well, I would say that, you 23 MR. HAAG: 24 looked at the issue. We did several We ended up taking enforcement actions 25 inspections.

against TVA for those. We will be doing follow-up inspections. We have not done those follow-up inspections yet.

MEMBER-AT-LARGE RAY: Okay.

MR. HAAG: We're still waiting on some of the corrective actions. But we did some interim inspections where once the issue was identified and before we did our final enforcement actions -- interim actions to understand how TVA was addressing the issue and make sure they had the proper scope and extended condition. And I would say we were satisfied with the actions that they had in place. And then they did make changes to their Commercial-Grade Dedication No doubt they made changes to those programs Program. to address the violations and the problems that we identified. We also have looked at it as far as fleet-wide impacts on the other operating sites. So again, we were satisfied with the actions that we had We still have final inspections to close out the violations.

MEMBER-AT-LARGE RAY: That's fine. Okay.

MR. HAAG: I guess the last point I'd make is that based on where we looked at as far as inspection resources, what we have within my branch and other capabilities in the region, we believe we

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have sufficient resources to perform the remaining inspections within the desired time frame. That's not to say there may be points where we look at other regions to assist some of the Unit 2 efforts where we have things that are stacking up. But that's not unusual. We've done that before. We did it at Browns Ferry Unit 1 where we looked for help from other regions. So I would anticipate we would be in that same situation.

So the status of our inspection activities. So out of those 543 items that I mentioned earlier that encompass Inspection the Program we have closed out 346. The remaining open items, the majority of them have been inspected to some degree. And what we're waiting on are specific actions that the inspector, when he looked at an open item, felt there was some other parts that they needed to look at. And for the most part those are they need to actually see some implementation.

For many of these open items we took an approach where we would look at TVA's engineering proposal and how they planned to address and correct the issue and look at their paperwork, whether it was actually issued work orders, engineering documents to make sure they were on the right track. So we would

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status many of these inspection items, but we specified in the report that we wanted to look at some parts of implementation. So that's what we're waiting for is for TVA to take some actions and then we will go out and be able close out the remaining open items.

The results of our construction inspections. I just want to give you a little background on how we're doing assessment of TVA performance as far as their construction activities. We use the same process that we have implemented for the operating site. Under the ROP we do periodic assessments, whether it's end of cycle reviews, midcycle reviews, quarterly reviews. We do very similar activities for Watts Bar 2 in looking at inspection results and making sure we're on the right track and haven't missed something.

So, and for those assessment activities we issue periodic letters to TVA informing them of the results. So at least twice a year at the end of cycle and mid-cycle we issue them an assessment letter. And for the most part the majority of those letters we've told TVA that we view their performance as -- that they were generally conducted in a manner that they complied with our regulations and rules, conditions of their construction permit and the regulatory framework

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For the most recent assessment that we did mid-cycle 2013 we factored in the commercial-grade dedication violation which was a severe level 3 violation, so that was factored into and recognized as part of our assessment of their performance. mentioned earlier, we still have follow-up inspections we need to do for those violations, but for all previous assessments, again the overall conclusion was we felt like they were performing activities in a manner that complied with our regulations and rules. Clearly there were violations. We have had a large number of -- I say that -- I don't want to overcharacterize -- a large number of severe level 4 We reviewed those during the periodic violations. assessments; looked for trends. We also do crosscutting aspects very similar to the ROP to see if there's problems that may cross lines. So we do those type of assessments.

As far as continuing on with the status of our inspection activities, we're preparing for preoperational testing. We've done just a very few, a small amount of pre-operational testing inspections. Clearly the majority of that will happen next year, and I think I'll talk about that a little more later

on.

Our current focus is to complete the
remaining inspection items. We have been interacting
with TVA. We want to be very explicit with what's
left to be inspected so they can give us some time
frames and then we can schedule those inspections.
Based on the schedule and where we're at we need to
get these inspections done within the next year. You
know, clearly if we're going to support a schedule
that we've talked about these inspections need to be
done. And we want to make sure we're looking ahead,
scheduling the inspections so we're not reacting at
the end and with any undo pressure.

Mr. Ray, you had a question early on as far as how we may be looking at inspecting construction activities with the question do they impact or could they impact Unit 1? Let me just give you a little bit of an understanding of what we're doing there.

MEMBER-AT-LARGE RAY: Construction and start-up testing.

MR. HAAG: Yes. We recognized that as a concern early on in the project and we've issued some guidance, interim guidance within the region for both the Unit 1 and the Unit 2 inspectors to look at

construction activities to make sure that TVA has, one, evaluated those activities. And if they have identified actions, management actions or controls, that they have installed those controls, we do independent assessments to look at construction activities to see did they miss something as far as vulnerabilities or potential aspects that could impact Unit 2?

For pre-op testing we're clearly aware that they have shared systems that they're going to be testing, that there needs to be a coordination between the Unit 2 residents who will be following for the most part pre-op testing and the Unit 1 residents who also have a concern that testing of a service water, common shared service water, cooling water system does not impact the operating plant. So we are coordinating with that.

And just as an example, they're doing flushes of the common component cooling water system. They're currently doing flushes and preparing. We looked at their plans. We looked at the equipment they had in place. We raised questions as far as the adequacy of that equipment. So we are engaged in looking at that and asking TVA some very hard questions.

MEMBER-AT-LARGE RAY: Thank you.

MR. HAAG: As far as future inspection activities I think this is pretty obvious is that we're going to need to complete the remaining inspection items. There are less than 200 items currently on our plate. I'd point out that 17 of those items are fire protection items just to give you a sense that we do have efforts underway to look at fire protection, by the sheer number. We've already done some inspection in that area and we have planned at least two team inspections for next year that will look at fire protection and many of the things that we've talked about earlier.

As far pre-operational testing as inspections, I mentioned earlier that we have a team leader dedicated to coordinating our inspections of pre-op testing. We have identified the test that we Those are the mandatory tests and want to focus on. the primal tests that actually will look at system We have lead inspectors assigned to those operation. There's at least two tests coming up later tests. this year in November and December. We've got people staged ready to perform those inspections, or are at least preparing for those inspections, and with the understanding that the majority of the testing will

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1 take place next year again to support the schedule and 2 that we need to be ready for those inspections. 3 We're also preparing for the operational 4 preparedness inspections. Those are the ones called 5 out in Manual Chapter 25-13. They look at the typical support programs like radiation protection, security, 6 7 chemistry. There's QA. So we're looking at those and 8 we're having to partner with the regional inspectors, 9 the DRS inspectors who look at those at the operating 10 site because they have the expertise. coordinating with them to make sure we understand what 11 action TVA's taken as far as transitioning their 12 program such that we can then come out and do our 13 14 inspections. And those inspections we're hoping to 15 take place the first part of next year. Then the last thing would be the Fukushima 16 17 inspections, clearly defining what needs to inspected for the orders, make sure we understand that 18 19 that we've got that scheduled. So we're interfacing with NRR, the different divisions there as 20 far as understanding that. 21 And I think that was all I had. 22 questions? 23 24 (No audible response.) 25 MEMBER-AT-LARGE RAY: Thank you, Bob.

1 Justin, did you want to say anything more? 2 MR. POOLE: No, the staff has finished its 3 presentation. 4 MEMBER-AT-LARGE RAY: A miracle has 5 occurred. (Laughter.) 6 7 MEMBER-AT-LARGE RAY: We're fairly close 8 to schedule. Thank you for getting us back where we needed to be. 9 We'll go around now, but I want to remind 10 everybody this is an interim letter we anticipate 11 And as such, concerns should be 12 preparing. articulated in a way that they can be responded to 13 14 prior to our final letter, so they need to be more 15 specific maybe than otherwise. But I'll leave that to the members to decide on their own. But in any event, 16 17 what we're being asked for here is to identify things that need to be addressed from our standpoint as best 18 19 we can tell today. 20 May was mentioned as the Subcommittee I'll say to everybody involved it's going to 21 be the Subcommittee week, not the Full Committee week 22 if it's May. But that's a minor scheduling point. 23 24 just wanted to make it now when I had a chance to do

so.

1	So we'll go around and with that preamble
2	ask anybody to put things on the table that they would
3	like to see addressed. We're not limited by the way
4	just to one Subcommittee meeting. That may well turn
5	out to be the case, but in any event, if there's an
6	increment that we should try and address based on what
7	the members feel is needed, we can do that as well.
8	Okay. So, Pete?
9	MEMBER RICCARDELLA: I have no comments.
10	MEMBER-AT-LARGE RAY: Sanjoy?
11	MEMBER BANERJEE: I'm not a member of the
12	Subcommittee, but I notice
13	MEMBER-AT-LARGE RAY: You're welcome at
14	all times.
15	MEMBER BANERJEE: Of course.
16	(Laughter.)
17	MEMBER BANERJEE: the boron dilution
18	issue is closed. Am I to understand that boron
19	behavior and long-term cooling issues are closed as
20	well, or is that open?
21	MR. POOLE: I believe it is closed, but
22	I
23	MEMBER BANERJEE: So it's not part of your
24	long-term cooling
25	MR. POOLE: No.

1	MEMBER BANERJEE: which was your first
2	item that was open.
3	MEMBER CORRADINI: I think you were out of
4	the room, but they've removed all offending
5	insulation. Just to help you out.
6	MEMBER BANERJEE: Well, that's still open.
7	MEMBER CORRADINI: No, but the boron is
8	MEMBER BANERJEE: Can you go back to that,
9	please? Yes.
10	MR. POOLE: Yes, which slide? The open
11	item one?
12	MEMBER BANERJEE: Yes. So under 59, long-
13	term cooling is still there?
14	MR. POOLE: Correct. We have not
15	completed our review of their response to Generic
16	Letter 2004-02, GSI 191.
17	MEMBER BANERJEE: And boil-off boron and
18	all that stuff?
19	MR. POOLE: Correct.
20	MEMBER BANERJEE: Okay. So when is that
21	going to be dealt with?
22	MR. POOLE: That will be in the next
23	Subcommittee.
24	MEMBER BANERJEE: Yes.
25	MEMBER-AT-LARGE RAY: Once again, if more

1 discussion is needed, let's not wait until the end of May with the expectation that we'll turn right around 2 and book them in a meeting if there's something that 3 4 needs to be discussed. 5 MEMBER BANERJEE: Maybe --We we're going to 6 MEMBER-AT-LARGE RAY: 7 have to have a half-a-day meeting earlier, if you're 8 ready, and it didn't get resolved. 9 Yes, this is Frank Koontz of 10 MR. KOONTZ: I think if your question is boron dilution as 11 TVA. far as long-term cooling, I believe the staff has done 12 pretty much of their review on that. That's related 13 14 to precipitation of boron in the long term. 15 MEMBER BANERJEE: Yes. MR. KOONTZ: And that analysis was done by 16 That's the slide that 17 Westinghouse. It was reviewed. referred to the fact had that that 18 had 19 accumulator concentrations for Unit 2 similar to Unit 1 and that we had calculated a three-20 hour hot leg switchover time. The analysis was longer 21 than that. It was on the order of four hours plus 22 that you needed to get the hot leg recirc. 23 The staff

agreed that three hours was sufficiently conservative.

That was even with mixing zones that were conservative

24

1	and also decay heats that were conservative. So I
2	think
3	MEMBER BANERJEE: So this was half the
4	lower term volume that you mixed actually?
5	MR. KOONTZ: I'd have to go back and look
6	at the analysis. I do have some of that here, if
7	you'd like to see some of it. I do remember it was a
8	conservative volume that they selected and the staff
9	agreed to.
10	MEMBER BANERJEE: Okay. So that part,
11	yes, that's what I was referring to.
12	MR. KOONTZ: Okay. I apologize.
13	MEMBER BANERJEE: Yes. Okay. So that's
14	useful to know. But it's closed right now?
15	MR. KOONTZ: Well, staff
16	MEMBER BANERJEE: We can open it
17	MEMBER-AT-LARGE RAY: We're here to create
18	our list of items, and so seven of them are listed
19	right there, but John has added what may well be an
20	eighth once we get
21	MEMBER BANERJEE: Okay. We'll take a
22	look.
23	MEMBER-AT-LARGE RAY: All right. So that
24	may appear in our letter as something we want to look
25	at further.
	1

1	Okay. Steve?
2	MEMBER SCHULTZ: It's a valuable interim
3	presentation. Thank you very much. I have nothing to
4	add to the list.
5	MEMBER-AT-LARGE RAY: Dick?
6	MEMBER SKILLMAN: Thank you for the
7	presentation. Nothing to add.
8	MEMBER-AT-LARGE RAY: Dennis? Dana?
9	(No audible response.)
10	MEMBER-AT-LARGE RAY: Okay. I'll start
11	back over here. Joy? Charlie? John?
12	VICE CHAIR STETKAR: No, thank you.
13	MEMBER-AT-LARGE RAY: The boss?
14	CHAIRMAN ARMIJO: Nothing. Good
15	presentation from both the licensee and the staff.
16	Appreciate it.
17	MEMBER-AT-LARGE RAY: As I say, it's a
18	miracle, but we're done.
19	(Laughter.)
20	MEMBER-AT-LARGE RAY: And I will turn it
21	back to you then, Mr. Chairman.
22	CHAIRMAN ARMIJO: Yes, well outstanding
23	management from Mr. Ray. We'll take a break for 15
24	minutes and reconvene at 10:45.
25	MR. CROUCH: Could we give you the answer

1	to one of your questions that you gave us?
2	MEMBER-AT-LARGE RAY: Well, hold on a
3	second. Let's talk off line, and then if you have an
4	answer you want to put on the record, we'll do it as
5	the first thing when we resume. Is that all right,
6	Sam?
7	CHAIRMAN ARMIJO: Yes.
8	MEMBER-AT-LARGE RAY: Okay. So we'll take
9	a break. We'll go on the record and if there's
10	something you want to add, we'll do that.
11	(Whereupon, the above-entitled matter went
12	off the record at 10:31 a.m. and resumed at 10:46
13	a.m.)
14	CHAIRMAN ARMIJO: We're going to
15	reconvene. I'd ask for the staff to be a little
16	patient with us. We had one residual issue from the
17	TVA briefing.
18	MEMBER-AT-LARGE RAY: Thank you, medical
19	community. During the break TVA indicated they had a
20	response to our earlier discussion. We thought we'd
21	put it on the record here. And so I'll ask that we do
22	so now.
23	MR. KOONTZ: Thank you. This is Frank
24	Koontz. We did look up some of the materials that
25	were asked. What we found was is that the Unit 2

	lacksquare
1	steam generator tubes are Allow 690.
2	MEMBER-AT-LARGE RAY: Oh, that's good.
3	MR. KOONTZ: And Unit 1 the replacement
4	steam generator tubes I'm sorry, 600.
5	MEMBER-AT-LARGE RAY: Oh, 600? Oh
6	CHAIRMAN ARMIJO: Not good.
7	(Laughter.)
8	MEMBER-AT-LARGE RAY: Why don't we start
9	over again?
10	
11	MEMBER BALLINGER: Yes, 600 dash what?
12	MR. KOONTZ: The Unit 2 steam generator
13	tubes, which still has the original steam generators,
14	are Alloy 600, and they are
15	CHAIRMAN ARMIJO: Thermally treated or
16	just mill-annealed. Why didn't we just do this off
17	line?
18	MR. KOONTZ: They were mill-annealed.
19	MEMBER-AT-LARGE RAY: Because I want it on
20	the record.
21	MR. KOONTZ: They were mill-annealed. 600
22	mill-annealed. The Unit 1 RSG is 690 heat treated.
23	MEMBER-AT-LARGE RAY: Okay.
24	MR. KOONTZ: Another question you had was
25	on the split pins. They're type 316 strain hardened

1	stainless steel.
2	MEMBER-AT-LARGE RAY: Okay. Thanks.
3	MR. KOONTZ: Another question that was
4	asked was related to the WINCISE system. The
5	detectors are good for 20-year life, at which time
6	they're replaced. And the original detectors were
7	rhodium. I'm not sure what we said with the rhodium.
8	I think that answered the questions we had.
9	Oh, the other thing we did verify is that
LO	the boron, long-term boron precipitation is addressed
l1	in SSER 24 by the staff. So I provided that
L2	information.
L3	MEMBER-AT-LARGE RAY: Very good.
L4	MR. KOONTZ: That's all we have.
L5	MEMBER-AT-LARGE RAY: Thank you so much.
L6	CHAIRMAN ARMIJO: Okay. Thank you.
L7	MEMBER-AT-LARGE RAY: I apologize for the
L8	interruption and I'll turn back to you.
L9	CHAIRMAN ARMIJO: Okay. Steve, will you
20	take us through the next presentation?
21	MEMBER SCHULTZ: Thank you, Chairman
22	Armijo.
23	The next presentation is being provided by
24	the staff. It is on their activities related to the
25	NTTF Recommendation 1 under which they've been

directed by the Commission to develop a disposition paper associated with the recommendation.

I just wanted to briefly introduce this by reviewing the Subcommittee meetings that we had over the last year-and-a-half, because we've had several. The staff has done a lot of work associated with the developing of this paper and that work has been performed keeping us informed through the Subcommittee process, and we've been able to work with the staff as a result of those meetings.

In 2012 we held two meetings with the staff and in those meetings I would characterize them by saying that the staff was working diligently to understand the NTTF Recommendation 1, dig into the meaning of each of the elements associated with that recommendation within the staff, outside the staff, through public meetings as well. So the activities have been really focused in 2012 in generating that understanding.

Through that process they've determined that they ought to focus the effort by winnowing down the large number of activities that they had developed through that search to the most important improvement activities that they could recommend to the Commission. They did that through the development of

a white paper early this year. Following that we had subsequent meetings with the working group that the staff had developed, and they had meetings with the public, members of industry to further focus their activity.

The white paper went out for public comment. They received public comments. They resolved public comments. Rather than reissuing that paper, they developed the draft SECY, Version 1, I will call it, that we first reviewed and most recently as of last week we saw an updated version of that which reflects management comments.

So again, just in summary I would say it's been a very active interaction that we have had with the staff. We had a full day Subcommittee meeting this Tuesday and we want to follow that up with a shorter presentation to the Full Committee. We have been asked, the Committee has been asked and we are working to provide our letter to the group developing the SECY. The letter we are writing will be to the Commission, but they have in their schedule and have had in their schedule the opportunity to review our letter -- if we can get it to them in time, review their letter and incorporate their comments related to our views in the SECY that they're going to deliver to

1 the Commission. And that is scheduled for early December, December 2nd through -- then December 9th is 2 3 deliver date. 4 So with that, I'd like to turn the presentation over to Shana Helton, as Shana is the 5 acting deputy director of the Division of Policy and 6 7 Rulemaking within NRR. So, Shana, if you'd identify your staff 8 9 and we'll move onto the presentation. 10 MS. HELTON: Wonderful. Thank you very much for that very good introduction. We really 11 appreciate having the opportunity to come and speak to 12 the Committee on this topic today. 13 14 I'll introduce -- to my left is Mr. Daniel 15 Doyle, to my right is Mr. Richard Dudley, and to his 16 right is Ms. Mary Drouin. And they'll be giving the 17 bulk of the presentation today, but I do have a couple of opening remarks that I would like to make before 18 19 they begin. As so eloquently summarized, we have done 20 quite a bit of work over the past year-and-a-half to 21 The intent of Recommendation 1 is to 22 two years. ensure that the NRC has a, quote, "logical, systematic 23 24 and coherent regulatory framework for adequate

protection that appropriately balances defense-in-

depth and risk considerations."

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During the staff's review of Recommendation 1 and in developing the draft SECY paper that you are discussing today with recommendations on how to disposition Recommendation 1, we have looked at every part of our regulatory framework. Nothing was considered to be exempt from the staff's review.

As Member Schultz stated, we initially came up with I think roughly 12 different areas where we thought it was possible to improve the regulatory Those were released and discussed in the framework. public forum and we did whittle it down to the three main potential improvements that are the focus of our discussion today. These potential improvements range from defining and developing evaluation criteria for adequacy reevaluating of defense-in-depth, to accidents and events at multi-unit sites, to defining criteria to assist the Commission in determining when we have adequate protection.

The three main activities we'll discuss today are specifically focused on Improvement Activity 1, to establish a design basis extension category of events and associated regulatory requirements; and Improvement Activity 2, which is to establish

Commission expectations for defense-in-depth; and then Improvement Activity 3, which is to clarify the role of voluntary industry initiatives in the NRC regulatory process.

And as you will hear in the staff's presentation, we have presented a paper where it is what I would call an à la carte menu the Commission could use to approve the staff moving forward to further develop all three of these improvement activities, or just a few, or none. We have a good justification for any of those decisions that the Commission might make.

We have looked at various approaches to implement these three improvement activities should the Commission direct us to do further work in those areas and selected the best approach for each of them and explained and justified our selections in the Recommendation 1 SECY paper and enclosures. As Member Schultz noted, we have revised the paper to address management comments. Our plan for going forward with the SECY paper is to address whatever insights we get from the Advisory Committee on Reactor Safequards and try to respond to those, and if needed we'll go back senior management for another concurrence before we send the paper up in early

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December. Also I'd like to note that on January 10th we have a date scheduled to meet with the Commission on this topic.

I want to emphasize that during this effort we were able to confirm the robust nature of our existing regulatory framework, but in the spirit of continuous improvement we are recommending enhancements to improve the clarity, efficiency and effectiveness of our regulatory approach. Although these proposed enhancements are not required to ensure the safety of existing nuclear power plants, we expect that they would result in modest safety benefits.

We thank this Committee for its determined effort to review, evaluate and comment on our work throughout the process. We have had several chances to present to the Subcommittee on this topic and we have found the ACRS comments and discussions to be very helpful in moving forward and developing our recommendations. And I would like to express a special thank you for this week's consolidated schedule of the Subcommittee meeting on Tuesday and the Full Committee meeting today on Thursday. We were reeling from the effects of the federal shutdown and we very much appreciate the accommodations made by this Committee.

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With that, I'll just say that we're eager to discuss our draft paper with you today and I'll turn it over to Mr. Dudley.

MR. DUDLEY: Thank you, Shana. On to slide 2, please. So in August of 2007 the Commission directed us to provide recommendations to disposition the Near-Term Task Force proposals and Recommendation In response to that we have identified three potential regulatory framework improvement activities, but the objective of the SECY paper is to get the Commission to approve the staff's use of additional fully evaluate the implementation resources to approaches for these three activities. So we don't fully know how all of these activities will work at this point. We're asking the Commission to authorize us to spend the resources to thoroughly look at these improvement activities.

They are: Improvement Activity 1, to establish a design basis extension category of events and regulatory requirements; Activity 2, to establish Commission expectations for defense-in-depth; and Improvement Activity 3, to clarify the role of voluntary industry initiatives in our regulatory process.

And so if the Commission authorizes the

resources for us to pursue and further evaluate these activities, we're going to do that in a public transparent process just as we've developed the recommendations up to now and we'll interact with this committee at that point to work out the details of how these improvement activities, if authorized by the Commission -- how they would work. So you'll hear more from us if the Commission authorizes us to proceed.

And then after we have fully fleshed out and defined how these improvement activities would work, we will go back to the Commission with another Commission paper and ask for their authorization for us to implement the activities.

So Improvement Activity 1 is the design basis extension category. And on slide 4, this is a summary of how we would establish this category to address future safety issues. And we would use existing processes to identify issues and concerns as candidates for rulemaking. Those processes include the Generic Issues Program; we discussed these before, the Reactor Oversight Program, the Reactor Operating Experience Program, the Accident Sequence Precursor Program, Industry Trends Program and the Agency Action Review meeting, and two different public petition

processes. These would be the ways we would identify yourself issues and concerns as rulemaking candidates. And we would also propose to use existing processes to evaluate these issues to determine when we would need to promulgate an additional regulation or requirement to address the issues that we might find.

The existing criteria are the criteria for adequate protection, and that's a determination made by the Commission. And the criteria for adequate protection would not be changed at all by any of these three improvement activities.

The other criterion for issuing a rule is safety enhancement. We would propose to continue to use the criteria in the Regulatory Analysis Guidelines, but those guidelines are being updated. The Commission has already authorized us to update them to update the dollars per person rem and the cost of replacement power.

And under Improvement Activity 2, as part of Recommendation 1, we're also suggesting that we pursue criteria for defense-in-depth and develop them and include defense-in-depth criteria into the Regulatory Analysis Guidelines to allow us to reflect defense-in-depth better when making rulemaking decisions.

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The most important part of Improvement Activity 1 is that we are going to develop criteria to provide mostly to the NRC rulemaking staff to ensure that we issue coherent, consistent and complete design basis extension rules. We'll develop these criteria I said in a public process with stakeholder participation and we'll document the criteria in a publicly available document. We believe every design basis extension rule should have clear criteria for treatment, and this guidance will help the staff in determining appropriate treatment for a particular design basis extension rule. Each rule should have some sort of a change process for licensee-initiated changes. We should also specify clear FSAR update and other appropriate documentation requirements, training requirements and analysis methods acceptance criteria.

I struggle heroically to MEMBER POWERS: understand what's different about this, and it must come from a presumption that those cases where we have extended the design basis in the past; and there are at least three of them I can think of -- that they had some failing. And what are those failings? what did you find deficient in Appendix R when it was introduced, or the station blackout, or the ATWS rule?

1	What was it that bothers you that feels that you need
2	to codify the process?
3	MR. DUDLEY: I think each of the beyond-
4	design-basis rules that we've issued over time, over
5	the last 35 years or so
6	MEMBER POWERS: Yes, about that.
7	MR. DUDLEY: I think is when the
8	ATWS was the first one. Well, anyway.
9	MEMBER POWERS: No, Appendix R was the
10	first one.
11	MR. DUDLEY: Pardon?
12	MEMBER POWERS: Appendix R was the first
13	one.
14	MR. DUDLEY: Well, yes. Each one got
15	better. But I think if you look at the ATWS rule, the
16	criteria for treatment is that the equipment should be
17	reliable. And that was it. Reliable and I think
18	independent from signal to actuation, or something
19	like that. But those were the only criteria
20	specified. It didn't say how you would update your
21	FSAR. It didn't say what sort of a change process.
22	MEMBER POWERS: Didn't need to. That's
23	already in the regulations.
24	MR. DUDLEY: 50.71 requires that now, yes.
25	MEMBER POWERS: Yes, I mean that's already

1 there. You didn't need to tell them in the ATWS rule how to update their FSAR. It says so in the existing 2 3 regulations. They know they do it every year. 4 MR. DUDLEY: Okay. Over time I think we 5 get better and better and better at writing these 6 beyond-design-basis regulations. And I guess our most 7 recent one was 50.54(hh), Loss of Large Areas Due to 8 Fires and Explosions. And that one the Near-Term Task 9 Force report pointed out doesn't have any requirements 10 for any quality requirements. So I quess that's for quality assurance or quality control. 11 MEMBER POWERS: Are they even in the 12 regulations? 13 14 MR. DUDLEY: So we're getting better and 15 better, but we need to make sure that each individual rule that we issue in the future addresses all of 16 these criteria. 17 The problem seems to me is MEMBER POWERS: 18 19 that because these are rare events that they are liable to be peculiar events and anything you write 20 inappropriate 21 best is and I mean these things don't happen very 22 constraining. often, very seldom in fact. 23 24 MEMBER CORRADINI: Can I ask Dana's question differently? I'd be okay with this process 25

1	if you're telling me that something by this process is
2	going to come out of the design basis and go into the
3	gray zone. All I hear here is codifying what's in the
4	gray zone and potentially putting something that's in
5	the white zone into the gray zone. And I'm kind of
6	over here with Dana; I'm struggling to see what this
7	accomplishes.
8	MS. HELTON: I could offer a response.
9	I'm not sure that I'll directly address your question.
10	MEMBER CORRADINI: That's okay. It's more
11	of a comment, so I'm not
12	MS. HELTON: Right.
13	MEMBER CORRADINI: I'm just listening to
14	how Dana's asking the question. I'm just trying to
15	broaden it a bit. But I think I'm kind of with him in
16	my
17	MS. HELTON: And I understood the comment.
18	One way of looking at what we're trying to do with the
19	staff guidance on things like treatment or the change
20	process of FSAR updates. Another way to look at it,
21	this is a very good knowledge management exercise. I
22	agree that the extended design basis is something that
23	we'd probably be doing on a fairly rare infrequent
24	basis. I know that the rulemakers who are currently
25	working on things like the station blackout mitigation

1	strategies rule think that it would be very good to
2	have this guidance available to them right now as they
3	proceed through with these design extension
4	rulemakings. You know, with staff attrition, taking
5	those lessons learned and the insights for things like
6	the ATWS rule, Station Blackout Appendix R and looking
7	at the kind of considerations that a rulemaker would
8	have to think about when they're developing a new
9	regulation that might not be covered by the change
10	process in 50.59
11	MEMBER POWERS: Why don't you just
12	MS. HELTON: you know, having some
13	guidance put together for the staff rulemaker would be
14	very helpful.
15	MEMBER POWERS: So why don't you just put
16	it into a management directive?
17	MS. HELTON: That's exactly what we're
18	thinking of doing. When we presented to the
19	Subcommittee on Tuesday earlier this week, I believe
20	our sides talked about doing a NUREG. As a result of
21	the discussion about the level of weight a NUREG would
22	hold versus a management directive, I think our
23	thinking might be now that a management directive is
24	a little more appropriate. We're a little vague in

the slide. We just say we'll develop criteria,

because that is an implementation detail. If the Commission directs us to go forward with this, we'd look at what's the appropriate structure within our guidance, management directive, Reg Guide, NUREG.

But we're not recommending as part of the staff recommendation a rulemaking to establish the design basis category, because I think that we somewhat agree with your viewpoint that it's already in the regulations. There already is a design extension category. It's there just as a natural way that we've progressed through adding regulations to And for the sake of, you know, having the 10 CFR. some stable predictable regulation, we don't feel that shaking up the regulatory structure in 10 CFR is necessary to address this design criteria. But going forward adding new rules to that category we would want to make sure that we add them taking consideration all of these things that are listed on the slide.

MEMBER POWERS: Why do you need the Commission permission to adjust a management directive?

MS. HELTON: I'm not sure whether we do, but the Commission has asked us to take a look at the NTTF Recommendation 1 and make a recommendation on how

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to disposition that. So this is one of the elements
of the staff's recommendation for how to disposition
the recommendation.
MEMBER CORRADINI: So let me ask my
question just to follow on. So is it the intent to
take a look at what's design base and maybe stick it
here?
MR. DUDLEY: No.
MEMBER CORRADINI: I assume the answer to
that is no, but maybe I want to make it clear about
that.
MR. DUDLEY: The answer is no.
MEMBER CORRADINI: Okay.
MR. DUDLEY: We're not planning to
MEMBER CORRADINI: Okay.
MR. DUDLEY: come up with criteria to
remove design basis requirements or reduce the
mitigation and/or change them and move them into this
new category where mitigation is less. We're not
planning to do that with this effort.
On slide 5, other characteristics of this
proposed new category would be that we would continue
to maintain the existing generic regulatory framework
where regulations are issued applicable to a

particular type or class of plants. We would not

require a plant-specific PRA. We would not propose a plant-specific licensing basis based on the risk profiles associated with the PRAs of individual plants.

The approach would be applicable to both current and future licensees and applicants. We would grandfather unchanged the existing beyond-design-basis regulations because, as you note, Dr. Powers, these rules are okay. We have worked our way through them and whatever might have been unclear or whatever at the time, we have all worked out. People understand them. And so there is no need to change them. We would just consider them to be in this category and we would not make any changes to them.

We'll develop these criteria for writing new design basis extension rules, and we would apply them only to new issues or new information, new regulations that we need to develop, or to the legacy rules; the station blackout rule, the ATWS rule. If some issue comes up and we decide we needed to go back and amend one of those legacy beyond-design-basis rules, then clearly we would go through the new process and use the new criteria to ensure that that amended rule is thorough and complete and coherent.

We will include in this design basis

1	extension category a number of ongoing beyond-design-
2	basis requirements or regulations. The risk-informed
3	ECCS requirements under 50.46(a) naturally fit into
4	this design basis extension category.
5	MEMBER POWERS: I'm crushed that you don't
6	put (b) in there as well.
7	MR. DUDLEY: Pardon?
8	MEMBER POWERS: 50.46(b) as well as (a).
9	(b) is never going to get incorporated, I swear.
10	MR. DUDLEY: Okay. The risk-informed GSI-
11	191 acceptance criteria are for beyond design or
12	would also fit. And all of the ongoing Fukushima
13	rules are beyond-design-basis requirements. And in
14	fact industry has indicated that they're in favor of
15	certain aspects of this approach because they see an
16	immediate for treatment guidance for the staff to
17	develop that and get Commission buy-in on that. And
18	so industry is very favorable of this aspect that we
19	would develop treatment guidance.
20	Also the way we have set this approach up
21	by using primarily existing processes. The approach
22	is very low-cost for the NRC and even lower cost for
23	licensees.
24	MEMBER POWERS: Nothing is low-cost for a
25	licensee.

1 MR. DUDLEY: Pardon me? Nothing is low-cost for 2 MEMBER POWERS: the licensee. 3 4 MR. DUDLEY: Well, we will issue the rule. 5 (Laughter.) I thought you weren't 6 MEMBER POWERS: 7 issuing the rule. MR. DUDLEY: Well, I mean the point is 8 9 that this process is for the staff to develop guidance so that the staff writes better and more thorough 10 And so we can do that internally, although it 11 rules. will be done in a transparent process and licensees 12 can participate if they wish. But it really doesn't 13 14 require licensee involvement. On slide 6 the expected products of the 15 design basis extension category would be to develop 16 this overall approach for issuing these design basis 17 extension rules. It would be documented in some sort 18 19 of a publicly-available document with the detailed quidance to the rulemaking staff for how to properly 20 write such regulations. We would revise Interim Staff 21 implement 22 to the approach; management directives, office instruction, inspection manual 23

chapters. And as an example of a possible outcome,

had we established the design basis extension category

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before the NRC issued 50.54(h) on loss of large areas, that rule would have been designated when we were writing it as a design basis extension rule. And the guidance to the staff would have ensured that we had included quality requirements in 50.54(hh) and they are not currently included in that rule.

That completes my summary of the design basis extension proposed category. Are there any questions regarding it? Any additional questions?

MEMBER SCHULTZ: Members of the Committee?

VICE CHAIR STETKAR: We've had some discussion in the Subcommittee meeting, and I know not all of the members were there. I keep struggling with this notion of the fact that in that category; and the devil's always in the details, this NUREG and the quidance, that category will be populated by a variety of things; and we'll call them that, that justified either because of consideration of adequate cost-benefit justification, protection, considerations, whatever they might be and various degrees of regulatory treatment of those items might differ wildly depending on their assessment; let me just call it that.

That doesn't sound too coherent, systematic, comprehensive in the sense of the spirit;

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let me call it that, of the Near-Term Task Force recommendation. So we have to have a process that we understand why things are allocated to a certain category and that we understand why the things that are allocated to that category are treated in a certain way, rather than just kind of doing it on a case-by-case basis, which is essentially what we've done in the past.

Could you respond to that a little bit? MR. DUDLEY: Well, it's not coherent yet because we're not finished. I mean we need the Commission to authorize the resources for us to look into this thoroughly. We have a number of different things we're looking at. I mean treatment requirements, you know, for -- you have a set of safety grade requirements. On the other spectrum you have commercial grade, you know? What does commercial grade mean? If you said it needs to be commercial grade, what does that mean? I don't think that's written down anywhere. And then you need something in the middle for the safety enhancement requirements.

So we're looking at, you know, putting -we've committed to a single standard set of treatment
requirements for the stuff in the middle, the safety
enhancement regulations. But there may be cases where

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for a particular rule one aspect of it that's critical needs to be safety grade. I just don't know. But we are going to look at this and we're going to come up with the best approach that we can.

We're also considering what we're calling a treatment panel where you would have a group of senior-level staff members who are frequently called on to look at a new rule or a new issue and assess And it would kind of take the issue away treatment. from the individual staff member, who is the proponent of the rule who sometimes is a little offended if that person doesn't get high-level treatment for activity, and put it in the hands of a diversified group of folks with more experience so that when judgment was required, the folks who exercise that judgment have done it before and perhaps aren't so sometimes emotionally involved in the rule as individual staff might be.

VICE CHAIR STETKAR: I wanted to kind of step back from details of implementation, which is what you're sort of speculating about right now, and focus more on the high-level process, which I thought that the task force was recommending a more consistent decision making process that had better defined criteria that were applied consistently for both

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determining when something rose to a level that required rulemaking or enhanced regulatory treatment, or as Dr. Corradini mentioned, also an evaluation that something perhaps we're paying too much attention to because it may not necessarily be justified. So criteria for making that decision.

And once something is identified as requiring enhanced regulatory treatment at a level below what we call safety-related; equipment today, for example, a rationale for justifying what level of treatment would be required there. Not how it was done. You know, not a panel. That's too premature at this notion. It's just that overall framework.

And I hear what you're saying about how you might write guidance for making that implementation process work. I don't see how what's being proposed addresses the more fundamental question in terms of the decision making and a coherent structure for making those types of decisions. I don't. You know, that's my own personal opinion, obviously.

MR. DINSMORE: Yes. Hi, this is Steve

Dinsmore from the NRR PRA Licensing Branch. I guess
one way to answer your question is we started off by
trying to figure out the stuff in the design basis is

1	there for adequate protection. Adequate protection is
2	not very well defined. And my interpretation is it
3	probably should not be made clearly defined because it
4	kind of changes and new information so you didn't
5	want to put yourself in a box and say this is design
6	basis because it's adequate protection. Everything
7	else can be kind of talked about.
8	And so when we started off with that
9	position that we don't really want to define adequate
LO	protection. We don't even want to try right now.
11	Maybe later, but not now.
L2	VICE CHAIR STETKAR: Well, that's clearly
L3	stated as such in the paper.
L4	MR. DINSMORE: So then you're kind of,
L5	well
L6	MEMBER POWERS: Adequate protection has
L7	been clearly and precisely defined by the courts.
L8	Well, it was done by the Commission.
L9	CHAIRMAN ARMIJO: Okay. You're right.
20	The courts confirmed it, though. Right.
21	MEMBER POWERS: Well, the courts accepted
22	it. The courts required it. And it was defined
23	perfectly well, and I think brilliantly, by the way.
24	It's not useful in this context, but it's defined.
25	(Laughter.)

1 MR. MIZUNO: Well, I mean, this is Gary Mizuno, OGC. I guess --2 3 MEMBER POWERS: If OGC doesn't know this 4 definition, change the C. 5 (Laughter.) MR. MIZUNO: I mean you could call the 6 7 definition by reading. The court said that adequate 8 protection is what the Commission determines is the 9 minimum necessary. The Commission never --10 MEMBER POWERS: Well, the Commission very definitely did. The Commission --11 The Commissioner never 12 MR. MIZUNO: identified The Commission never 13 -- excuse me. 14 identified a technical criterion for determining 15 whether something should be --MEMBER POWERS: Oh, yes, there was no 16 17 requirement to do so either. That's right, and therefore MR. MIZUNO: 18 19 the court accepted in so many different instances the NRC articulating on a case-by-case basis what is 20 adequate protection. And that's where the Commission 21 stands right now. And we felt that based upon input 22 that we obtained from our management, as well as our 23 24 individual briefings of Commissioners, that that level

of flexibility was something that we would want to

1 retain in the future and that it would be a very difficult task for us to actually start going and 2 specific 3 defining through the establishment of 4 technical criteria, whether you consider it 5 deterministic or whether we start using or identifying additional risk measures to help identify what 6 7 constitutes adequate protection, you know, so that we move towards a combination of both deterministic and 8 9 risk measures. The Commission has never done that. 10 The Commission has done other things in the context of 11 things like backfit rule or regulatory analysis that 12 help make decisions, but they have never directly said 13 14 that this is the definition of adequate protection. 15 So that's the way we stand and I think that that's 16 where we say we've got to continue to allow that level 17 of flexibility. And there are lots of good, I will call them policy reasons why that's an acceptable 18 19 approach. Any other comments on 20 MR. DUDLEY: Improvement Activity 1? 21 (No audible response.) 22 Hearing none, I'll ask Mary 23 MR. DUDLEY: 24 talk about Improvement Activity 2 on

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defense-in-depth.

MS. DROUIN: Okay. Slide 8, please. In Improvement Activity 2 we're recommending to Commission that they approve development of a reactor policy statement on defense-in-depth and development of the associated implementation guidance. talk about the implementation guidance, that's where we're talking about development of criteria determine whether or not we have adequate defense-in-9 depth.

> To help the Commission in their decision we've given them some examples, and I really want to emphasize they're examples. You know, they would need to have to be thoroughly thought through. But it's to give them an example of what, you know, a policy statement would look like and what the implementation quidance would look like.

So, you know, we're talking about trying to put a structure, and when you give a proposed structure, come up with a definition of defense-indepth. You know, what are our set of principles in the implementation quidance? You know, what would be this decision process and what would be a potential set of the decision criteria?

MEMBER POWERS: Mary, let me ask you a question.

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1 MS. DROUIN: Okay. MEMBER POWERS: What caliber of gun did 2 they put to your head to get involved in this? 3 4 (Laughter.) 5 MEMBER POWERS: I mean we've been through this battle with 1.174 and we have ended up going to 6 7 a defense-in-depth philosophy because you run into troubles with every single one of these possibilities 8 9 that we couldn't overcome in 1.174. And so we said, 10 no, there really isn't a defense-in-depth structure or principle or definition. There is a philosophy. 11 Well first, personally I 12 MS. DROUIN: don't agree with your statement. 13 14 MEMBER POWERS: Whoa, okay. 15 (Laughter.) You know, I don't. 16 MS. DROUIN: 17 1.174, you know, was a tremendous advancement in looking at defense-in-depth. We looked at this in 18 19 detail in 1860 and I think that made some great strides. I think defense-in-depth, if you look at the 20 history, you know, going back to the 1940s, in all the 21 literature and everything, there's, you know, 22 great common themes. What we struggle with is being 23 24 able to discuss it using the same terminology and

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coming from the same place.

And what I mean by that, you know, people will say, okay, well, I agree that there's levels of defense. But, you know, some people will say the levels of defense is, you know, your three typical ones, you know, if you go back 30 years where it was the cladding, the vessel, the containment. And that strictly is defense-in-depth. And then people talk about, well, I define defense-in-depth in this way, and it's these set of principles. So people are all over the place.

But if you go through and pull out what everybody is saying and saying, okay, I'm going to start off and say I'm going to pick up and say a structure. Can I go through all of this stuff that's out there and see, you know, is there commonalities in a structure? And that's what I'm going to call it. You know, can I go through and pull out something that this is my definition? You know, these are my sets of levels of defense? And I think you can do that.

There has been a tremendous amount, you know, written up on defense-in-depth. And I think you can take that very rich history and come up with saying, okay, on a policy statement, you know, I'm going to formalize this from a Commission perspective and this is what I mean for defense-in-depth, and then

carrying that formalization, you know, of what the Commission's expectations are and to now here is my decision making process of how I'm going to determine that I have sufficient defense-in-depth.

MEMBER POWERS: And I will simply reiterate or confirm, well, you're right, there is a very rich history, and you're right, there has been a substantial evolution that indeed in the first manifestations it was a very hardware-based view of defense-in-depth.

MS. DROUIN: Yes.

MEMBER POWERS: And it has evolved substantially and it will continue to evolve. And again I'll reiterate, we looked at this, because we have a very practical problem with defense-in-depth safety philosophy. Defense-in-depth is an unbounded safety strategy, but when you take the hardware view, the problem you run into always with the hardware view is that if I have one containment, why not have two? If I put one filter system on, why not put two? If I have a redundant filter system, why not make it a diverse?

There is no bound inherent in defense-indepth. And we ran into the problem that no matter how we used risk assessment, how well it was done, how

comprehensively done, someone somewhere could always come along and say, yes, that's true. The RIS says we don't need it, but I want to put it in because of defense-in-depth. The defense-in-depth would always trump things. And if you try, as we did in 1.174, to come in and say, okay, here's what we mean by defense-in-depth, we run into this problem that, yes, people view defense-in-depth more in very diverse fashions. And we said, no, this is more a philosophy. And that's how we came up with the integrated decision making process, because it's more of a philosophy than a definition.

think you just run problems: One, it's very hard to get everybody to And second of all, by ossifying that in agree to it. a definition you will not allow this rich and very valuable evolution that we've gone through from first viewing defense-in-depth in terms of a variety of physical barriers to now viewing it in more of a conceptual foundation of it as a balance between measures we take for accident prevention and the take for accident remediation measures we consequence reduction.

MS. DROUIN: You know, I agree almost mostly with what you said. You did say a key thing

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about, you know, balancing, you know, what -- in terms of accident prevention and mitigation. But see, to me that is -- your basic principles of defense-in-depth is that you want both prevention and you want both mitigation. You don't want to put everything into trying to prevent something. Because, you know, we don't know everything and we don't know things as well as we think we should. So, you know, you want the preventive aspect there.

I would challenge you on 1.174 in that 1.174 did a very good job in laying out some principles, but 1.174 does not have in it, well, how about deciding whether or not I have sufficiently met those principles? How do I go about deciding, well, do I need a second containment? need more independence? Do I need more diversity? And I do think that you can come up with -- you know, I don't want to oversimplify it, you know, because I think it's going to be a challenge, but I do think you can lay out a decision making process to help guide you in having an -- I don't want to say intelligent discussion, but having a discussion that will get you place where you can come to a common understanding that, yes, I have sufficient defense-in-And I will get back to this, you know, on

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1 another slide, if you'll just bear with me now. MEMBER POWERS: I will, but I think I 2 would simply again say that the vehicle we chose in 3 4 setting up 1.17 was in fact the integrated decision 5 making, that we felt that any time you got into these a clear pathway 6 debates where there wasn't 7 resolution and it did take discussion, that the more 8 you ossify a catechism making that decision, the more 9 options you were taking off the table in a preemptive fashion. 10 MS. DROUIN: I don't think that's what is 11 occurring here. 12 MEMBER POWERS: Well, I think any time --13 I mean I think you went in --14 MS. DROUIN: Because I don't think that's 15 16 what we're proposing to do. 17 MEMBER POWERS: -- we've been run smack dab into the Arrow impossibility theorem on this, that 18 19 without dictating something that you cannot set up a coherent structure. I mean we definitely ran into the 20 Arrow impossibility theorem in 1.174. And our way 21 around it was the integrated decision making process. 22 We may just end up having to 23 MS. DROUIN: 24 agree to disagree, because I do think 1.174 can be

improved by development of the implementation guidance

to decide. If it comes out that in our definition, in our principles that we still think that 1.174 are the right set; and let's just say for discussion purposes that we think that's the right set, you know, I truly believe you can come up with a decision criteria that helps you decide, you know, when you've met those principles. And 1.174 does not give any guidance.

And the integrated decision making process, you know, doesn't help you with that because it tells you, you know, you cannot have -- I'm trying to remember the exact words, but it's something like, you know, you cannot have degraded defense-in-depth, you know? And I thought, well, okay, how do you make that decision, you know?

MEMBER POWERS: Well, I think we want to move on, but I will comment that the problem we ran into -- I mean you were part of this, so I don't need to tell you, but maybe I need to tell my fellows that were not part of it that we felt very strongly the idea that we could not anticipate every issue that was going to come up into 1.174 for the next 50 years, that they were going to be highly diverse, highly different, different manifestations and that, yes, I can probably come up with a catechism that's built into 1.174 that serves me very well to go through and

1 look at the ATWS rule.

That doesn't mean that it will be there, that catechism will not be confining when I look at the next issue that comes. And we wanted very much to avoid straightjacketing the process in the future because we had confidence that future generations could be a good deal more informed and the problems they would face would be a good deal different than those that we encounter now.

MS. DROUIN: And that's what we're doing, so that's great.

MEMBER POWERS: As soon as you start putting in a straightjacket on this, you're taking away options.

MS. DROUIN: And you keep using this term "straightjacket," you know, and I don't want to carry this on, but you know, we're not proposing something that's prescriptive and that would put a straightjacket on people. We're trying to give them some guidance. And to me guidance is not -- it doesn't have to be prescriptive and it doesn't have to bound you, but it can help lead you through your decision making.

MEMBER POWERS: I see you saying I'm going to dictate the process to you, I'm going to dictate a

structure to you, I'm going to dictate criteria to you. Well, those look like straightjackets to me.

MS. DROUIN: Let's move on and maybe we will get that clarified.

You know, when we talk about a structure, we're saying, you know, we would develop this whole way of how we approach defense-in-depth in a top-down logical manner to up front provide a definition of defense-in-depth. And there have been various definitions of defense-in-depth. There is one in the Commission white paper. There's one in the NRC Web In the strategic one there's one. somewhat of a definition, if you want to say it that, in 1.174. And they're all very similar. And there's a lot of consistencies, but there are some subtle You know, and one of the subtle differences in them. differences is, you know, whether or not safety margins is part of defense-in-depth. So, you know, we would try and capture and then NUREG-2150 came out with a definition of defense-in-depth.

So, you know, the policy statement would very clearly try and articulate, you know, what do we mean by defense-in-depth. And then what would be at a high level, you know, the various principles of defense-in-depth and what do we mean by these

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principles, you know? And this is where, you know, when you go across the history you see very different views about what a principle is. 1.174 says, well, independence is a principle versus somebody else might bring it to a higher level and say, okay, principles is that you have to have accident prevention and accident mitigation. So we're just trying to bring some commonality to what do we call these things, you and then what are the different levels of That's going to be on the next slide. these are the things that would be stated more at a high level and would show up in the policy paper. coming up with Then the real challenge is implementation quidance. And I'll talk about that in a minute.

So if we go to the next slide, this is trying to say for reactors, you know, when we had looked at it we were thinking, you know, well, you need to have and mitigation, and what do we mean by that? So for reactors we said, well, you know, we kind of visualize that there's four levels of defense. You know, the first one where your first principle is you're trying to preclude events that challenge safety. Then if, you know, those events occur, you want to prevent the events from leading to core

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1	damage. If core damage still occurs, you want to
2	contain and confine your radioactive material. And
3	then if that occurs, you want to protect the public
4	from the effects of radioactive releases. So these
5	are the four levels of defense. And then you would
6	have safety measures in your design. And operational
7	features would then be done to address each of these
8	levels of defense.
9	So the next slide. All this slide is
10	trying to portray is that, you know, coming up with a
11	decision process is going to be a little complicated,
12	but it can be done. And you would look at things such
13	as, you know, are your principles implemented? You
14	know, are your levels of defense met? You know, are
15	your safety margins adequate? Are your quantitative

MEMBER BLEY: Mary?

putting a straightjacket.

MS. DROUIN: Trying to get you to ask the right questions and everybody to be asking, you know, a similar set of questions.

accepted guidelines met? So this is just one very

preliminary view of perhaps a decision making process.

And then you would have guidance that goes along with

these. So I don't see this as being restrictive and

MEMBER BLEY: Dana's comments come back to

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a little of what was bothering me in the Subcommittee meeting and I didn't articulate very well. All I said was I was disappointed at the -- and if dismissal of risk assessment is being a component in Recommendation 1, I think going a step deeper it's bothersome to look at defense-in-depth in isolation.

And I really like what Dana said about the integrated decision process from 1.174. You know, when we did what is called the technology-neutral framework, that had this play of risk against defense-in-depth and how you balance that. And here we're looking at defense-in-depth as if it were a thing you can decide about all by itself, and including do we have enough? How far do we go in each of these levels? I think the levels are useful. And I guess it bothers me looking at this in isolation.

I think that gets you into the kind of troubles Dana was talking about. You know, we're not there yet, but when you start putting something absolute on are we adequately addressing in this chart, each of these different spots, that's where it really needs to be in the context of some kind of integrated decision process and --

MS. DROUIN: It will always be.

1	MEMBER BLEY: But that's not clear in the
2	SECY as it now stands. It reads as if one can look at
3	this in isolation and that we can develop these
4	criteria just thinking about defense-in-depth.
5	MS. DROUIN: Okay.
6	MEMBER BLEY: That's what bothers me right
7	now.
8	MS. DROUIN: Okay. Terms of 1860
9	MEMBER BLEY: And I wasn't able to tell
10	you that before.
11	MS. DROUIN: You know, in terms of 1860,
12	you're not really seeing something different than what
13	was in 1860.
14	MEMBER BLEY: Well, I am in that we only
15	have half of the picture here.
16	MS. DROUIN: Well, 1860, if you flip back
17	to the previous slide, you know, what you're seeing
18	here, because 1860 combined a structuralist with a
19	rationalist approach. And what you're seeing here on
20	this slide is the structuralist aspect. You know, it
21	doesn't completely match up with 1860 because 1860 had
22	five levels of defense, one of them being security,
23	and the security doesn't show up here. And I think we
24	called them different names in 1860.
25	MEMBER BLEY: Doesn't matter. That's not

1	what we're talking about here.
2	MS. DROUIN: Okay. But my point is, you
3	know, 1860 had a structuralist aspect to it. This is
4	the structuralist aspect.
5	MEMBER BLEY: There's nothing in this
6	document that says this is a structuralist aspect.
7	There's another side of this that will always have to
8	be included in decision making. I think that's a
9	problem.
LO	MR. DUDLEY: I think one of the points I'd
L1	like to make is this is a wonderful discussion, but I
L2	think it's the discussion that we would have at the
L3	very first ACRS meeting after the Commission
L4	authorizes us to spend the resources to go out and
L5	develop these concepts. You know, we're just not
L6	ready.
L7	MEMBER BLEY: I don't think so. I think
L8	you need it up front.
L9	MR. DUDLEY: No, I think you need it
20	well, I mean
21	MEMBER BLEY: Well, but if
22	MR. DUDLEY: You'll certainly get another
23	shot.
24	MEMBER BLEY: God forbid the bunch of
25	you get run over by a bus, the Commission says do it

1	this way. And the next group come in and just put
2	criteria on each of these things the way it's laid
3	out.
4	MR. DUDLEY: We'll have to make them read
5	the transcripts first, I guess.
6	MEMBER BLEY: Well, you could put
7	something in the SECY that puts this in that
8	perspective.
9	MS. DROUIN: I mean I think that we can
10	certainly go back through. You know, I thought that
11	the SECY made it very clear that, you know, these are
12	concepts and examples and this has to be much more
13	though out.
14	MEMBER BLEY: It's clear about that, but
15	the other side of this, that this needs to be part of
16	an integrated
17	MEMBER POWERS: Yes, I think you're
18	MEMBER BLEY: decision making process,
19	could be clearly stated.
20	MEMBER POWERS: I think you serve the
21	Commission
22	MS. DROUIN: Okay. But you know what? I
23	mean we can put that in the paper. There's no problem
24	with that. However, you're never make a decision on
25	defense-in-depth in isolation. We don't just come

along and say, okay --

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MEMBER BLEY: You've laid out a framework that somebody could use to do that.

MS. DROUIN: We've laid out a framework that would be part of your integrated decision making. Now if we go to the last slide, you know, here as an example if we had had this in place, it would have helped quite a bit on the containment filtered vents if we had had a process for how to look at defense-indepth as part of that whole integrated decision making that was happening on the filtered vents because a lot of that discussion was arguing over what do we mean by defense-in-depth? So, yes, we haven't talked about the integrated, but this is a tool that will be used in an integrated decision making process. And we're saying, okay, you know, for this part of integrated here's how to look at defense-in-depth.

Now if you need those words, we can add those words to the SECY paper, but you would never do this in isolation. I don't know how you would ever do it in isolation. This is always when, you know, you've got some event and you're looking at it and you're making a lot of decisions and one decision is how are we dealing with from a defense-in-depth aspect? So, you know, this is not, for example,

1	replacing 1.174. This would be enhancing the defense-
2	in-depth aspect of 1.174.
3	MEMBER POWERS: Well concede to me, Mary,
4	that I I don't know that you need to concede
5	anything
6	(Laughter.)
7	MEMBER POWERS: but let me advance the
8	point of view
9	(Laughter.)
10	MEMBER POWERS: that I think you serve
11	the Commission not well in asking them to support this
12	activity by not highlighting and emphasizing the
13	interplay between defense-in-depth and risk
14	assessment. The risk assessment is the only mechanism
15	we've found to constrain the cost of an unbridled
16	defense-in-depth approach.
17	MS. DROUIN: My response to that is that
18	we are not disregarding risk assessment. And if that
19	hasn't come out clear in the paper, then we need to
20	fix that.
21	MEMBER POWERS: I think you need to fix
22	that.
23	MS. DROUIN: Because that's
24	VICE CHAIR STETKAR: You do, because if
25	you read through the paper

1 MS. DROUIN: This is not a structuralist -- risk plays a big part of this process. 2 VICE CHAIR STETKAR: If you read through 3 4 the paper, however, as someone who has not been 5 involved in hearing these words, you are left with the impression that 6 distinct risk assessment 7 unnecessary. In fact it says PRAs can't be justified 8 to support this activity. It says that explicitly. 9 if PRAs can't be justified to support 10 activity, then I don't understand your statement orally that risk assessment is a vital aspect of this 11 It says in the paper that PRAs can't be activity. 12 justified, so I don't have to do a PRA. I don't need 13 14 to do risk assessment. DINSMORE: Yes, this is Steve 15 MR. If I could just make a comment. I think 16 17 the paper says that we couldn't justify the cost of PRAs based on the anticipated safety improvements 18 19 which could be --VICE CHAIR STETKAR: You know, Steve, you 20 can say whatever precise little words you want to 21 The take-away notion from reading the 22 finely craft. paper is PRAs are not justified. 23 24 MEMBER CORRADINI: For this activity. 25 VICE CHAIR STETKAR: But that is the way

1 the paper states for each activity individually. 2 MEMBER CORRADINI: And in general. But it's carefully 3 VICE CHAIR STETKAR: 4 crafted to say that it's not justified for this, it's 5 not justified for this, it's not justified for this. away with 6 As outside reader you come 7 impression, the natural impression that PRAs are not 8 justified to support this entire proposal from the 9 I can't draw any other conclusion. If you can convince me how I can draw another conclusion from 10 what's presented in this draft SECY paper, I would be 11 And obviously because of my background I'm 12 thrilled. I'm looking for that niche and I honestly 13 14 can't find it. I can't find any cleverly crafted 15 words. I think where the disconnect 16 MS. DROUIN: 17 is coming in is that when you look it at from a regulatory perspective and the writing of the -- let's 18 19 first talk about writing of the policy statement. Writing of the policy statement does not require a 20 rule for a PRA. You know, the policy statement is 21 just stating, you know, the Commission's expectations. 22 Now, the implementation guidance in making 23 24 your decisions from an NRC perspective we have the

necessary risk tools. We have the SPAR models.

have all those things in place. Now if the licensee wants to come in and say under a Reg Guide 1.174, Reg Guide 1.174 did not require a PRA rule. And that's all we're trying to say is that this does not require a PRA rule. We're not saying that a PRA doesn't have a role to play and can't be used. We just don't need to go write a rule.

And if you're seeing that different, then that would mean that we would need to have a rule to implement 1.174, which is -- you know, it's all about risk. And that did not require a PRA rule. And maybe the words aren't making that distinction and we need to improve the words so it makes that distinction is that it's not requiring a PRA rule. We're not saying the us of a PRA is not important and not vital. Of course it is.

MEMBER SCHULTZ: But the words that are provided in some of the new information that has been added associated with costs of PRA and relative benefits that one might derive leave the impression that the value of the PRA, site-specific or otherwise, is in fact diminished and provides rationale associated with that. And I think you'll find that we don't agree with that.

(Laughter.)

1	MEMBER SCHULTZ: We don't plan to discuss
2	it here, but we need to correct those points because
3	some of us at least, not all, believe that they're
4	inaccurate. And the statements do tie back and I
5	think contradict statements in the front of the
6	document that would suggest that PRA is going to be
7	used for Activities 1 and 2. It seems to give the
8	impression that Activities 1, 2, risk management
9	framework, that they're not required. It's a very
10	peculiar conclusion.
11	MS. DROUIN: See, you know, unfortunately
12	it gets into the legalities of interpreting that word
13	"require," and I think that's what is unfortunately
14	being misleading. You know, from a licensing
15	perspective, you know, I can't see a licensee coming
16	in on these activities without a PRA behind them. I
17	just don't see that. But what we're talking
18	MEMBER SCHULTZ: conclusion one draws
19	from reading the evaluation of PRA costs and benefits.
20	VICE CHAIR STETKAR: I think Mary's
21	MS. DROUIN: And so all we're trying to
22	say is that we don't feel that we need to go out and
23	write a PRA rule. And that's all we're talking about.
24	VICE CHAIR STETKAR: I think some of the
25	reasons for this discussion is that in many cases as

soon as we start having it it seems to devolve into how something ought to be done, the details of the guidance. You say, well, you need it to do this. You need it to do this. We're not talking at that level. We're talking about what ought to be done.

MS. DROUIN: Yes.

VICE CHAIR STETKAR: A framework. decision framework. That's pretty broad. That isn't whether I use an HP calculator or a Texas Instruments calculator to plan my retirement portfolio. basic principles ought I use to plan my retirement I don't care about the portfolio? That's the level. calculator, you know, or that I need a super good calculator to do very sophisticated calculations. as soon as we seem to be having these discussions; and there's a lot of that in the SECY paper, it's the implementation that gets the focus rather than the higher level what ought to be done, which, you know, was basically the genesis of this whole exercise.

MS. DROUIN: You know, all I can suggest is that we'll just go back through these SECY paper and enclosures and try and make that distinction because we aren't saying that risk does not have a role. I mean we are absolutely not saying that. And if that is coming across, then that is incorrect and

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156 1 we need to fix that. 2 VICE CHAIR STETKAR: You know, it would be 3 interesting actually to have, you know, someone who's 4 obviously not as biased pro-risk as I am read it and 5 see what type of -- and someone who's not as deeply 6 ingrained with, you know, two years of actually 7 battling over these concepts --8 MS. DROUIN: Yes. 9 VICE CHAIR STETKAR: -- and writing every 10 single word and thinking about the nuances of every single word as you all are read it and see what 11 impression they have in terms of the support or lack 12 thereof for the concepts of risk information. 13 14 MS. DROUIN: And we did do that. 15 we're going to have to do it again, because on the 16 latest version, you know, we did put in some words, 17 you know, that said it is still expected that plantspecific PRAs would continue to be used for regulatory 18 19 risk-informed activities including the implementation of the improvement activities. So, you know, and 20 maybe we need to say that more frequently. 21 VICE CHAIR STETKAR: But there, too, it's 22 kind of like, you know, how to do it, not necessarily

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CHAIRMAN ARMIJO: Well, you do refer in

what ought to be done.

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1	the enclosures to Reg Guide 1.174 and its use in
2	providing criteria for when defense-in-depth is
3	adequate. You know, it's not that you're ignoring it.
4	VICE CHAIR STETKAR: You're looking at the
5	history that enclosure 4 is looking at.
6	CHAIRMAN ARMIJO: It may be in the
7	history, but maybe it should be up in the SECY itself,
8	moved up to a higher level. But it's certainly not
9	being ignored.
LO	MS. DROUIN: Yes, somehow I think that
L1	we're going to have to go back and read this and make
L2	sure that it just seems to me that people are
L3	getting confused with us saying we don't need a PRA
L4	rule with saying we don't plan to us PRA and we
L5	weren't going to use risk assessments.
L6	CHAIRMAN ARMIJO: Risk information.
L7	MS. DROUIN: And that's not what we're
L8	saying.
L9	CHAIRMAN ARMIJO: Yes.
20	MS. DROUIN: So I think we need to go back
21	and very carefully go through the SECY paper and the
22	enclosure and make sure that that distinction is very
23	clear.
24	MR. DINSMORE: Yes, this is Steve
25	Dinsmore. I quess just one quick thing: We

considered what the rule would look like if we were to write a PRA rule and we quickly discovered that, well, if you just write that they need a PRA, everybody's already got a PRA. They're already using it. So writing that rule wouldn't really get you much. To say that if you wanted to write a more complicated rule to describe how you were going to use it, then you'd have to figure out how you were going to use it, and we weren't quite prepared to go that far. So the intention was to say you didn't need a rule. It was not to say that you didn't need a PRA.

VICE CHAIR STETKAR: Just for the record if everybody's got a PRA and they're already using it, why is the industry so opposed to accepting the notion that you have to have a PRA? They have something that if you asked 104 different units what do you have, you say well sure I have a PRA. You know, yes, I have a calculator. It happens to look like a stick and sand where I draw lines in it, or I have a super computer. They're both called calculators. So be careful when you say, yes, everybody has a PRA. Because if that were true, you wouldn't see the push-back from the industry.

MR. DINSMORE: That's what I was trying to say was to put more in there you'd have to figure out

1 exactly how we're going to use it and you have to define what they need. And again, we didn't think 2 3 that that was appropriate at this time. MS. DROUIN: And it's also the maintenance 4 5 of the PRA. Okay. Well, that's my presentation. 6 7 (Laughter.) 8 MEMBER SCHULTZ: Biff Bradley at the 9 microphone. Biff, you had a comment? 10 MR. BRADLEY: Yes, thanks. Yes. Hi, this is Biff Bradley with NEI. I just wanted to speak to 11 12 John's statement. It is correct that the industry does have pretty -- you know, they do all have good 13 14 PRAs of varying degrees. Everyone has good internal And we're getting there with fire, we're 15 getting there with seismic pretty much as fast as we 16 17 can. I don't think it's the concept of having 18 19 a PRA that concerns us so much as -- one of the things we've observed is once you get the regulatory rubric 20 around this thing, it tends to turn into an exercise 21 of all this concentration on the minutia of the model 22 at the expense of really being able to use it the way 23 24 we would like. And we've seen this happen in fire

protection.

1	And we would love to get back on the
2	footing where if we could write this requirement the
3	same way, I would support it. If we could write it
4	the right way and in such a way that avoids us going
5	down that track. Really that is I think the essence
6	of the industry's concern, just to speak to that.
7	But, you know, maybe there's a way we can write a rule
8	that work. If it can get us back to what I'm talking
9	about, I think we'd support.
10	MS. HELTON: One thing I'd just like to
11	add, going back to slide 4, you know, I agree with
12	Mary wholeheartedly that if, you know, we're talking
13	about the distinction between requiring a PRA via a
14	rule, this is using risk insights balanced with
15	defense-in-depth.
16	CHAIRMAN ARMIJO: Use of risk information,
17	yes.
18	MS. HELTON: Right. And if we were to
19	write a PRA rule, everything that's in the second to
20	the last bullet, you know, with PRA quality, FSAR
21	update
22	CHAIRMAN ARMIJO: Actions. Audits.
23	MS. HELTON: when could a licensee
24	change their PRA without coming to the NRC for an
25	amendment, you know, that's the kind of

1	CHAIRMAN ARMIJO: But if you wrote a PRA
2	rule, wouldn't you require then that it be submitted
3	for approval, review and approval?
4	MS. HELTON: Right. So
5	CHAIRMAN ARMIJO: Right. And then if you
6	had review and approval and people didn't use it or
7	maintain it right, it would be subject to inspection,
8	audits
9	MS. HELTON: Well, but then now you're
10	talking about
11	CHAIRMAN ARMIJO: fines, all of that
12	junk as opposed to a useful tool that everybody agrees
13	is pretty good, adequate. And I certainly wouldn't
14	like to see such a thing shoved down the industry's
15	throat.
16	MR. BRADLEY: Just to note, there is a PRA
17	rule for new plants.
18	MS. HELTON: Right.
19	MR. BRADLEY: It's being done
20	CHAIRMAN ARMIJO: Yes, I know that.
21	MR. BRADLEY: just for the record.
22	CHAIRMAN ARMIJO: I know that.
23	VICE CHAIR STETKAR: And it also specifies
24	the requirements. It does tell you what you need to
25	do.

MS. HELTON: Right.

CHAIRMAN ARMIJO: Whether that gets

required on operating plants is the issue.

MEMBER SCHULTZ: Sam, we're ready to move

MS. HELTON: I think we are, too. Thank you.

MR. DUDLEY: Okay. Dan Doyle will now speak on Improvement Activity 3 regarding voluntary industry initiatives.

Okay. Again, this activity is MR. DOYLE: a lot more focused and narrow in scope than the other two activities, and this is focused on the situation where the NRC is contemplating accepting a substitute industry initiative regulated safety in for а enhancement. That's the focus of this activity. the current policy is that that is acceptable. is a process for factoring that into the regulatory So the first sub-bullet is that we would analysis. reaffirm that this is not acceptable for issues of adequate protection. But in those cases where there's not that determination that this is necessary for adequate protection. It's just something that is being evaluated to determine if it is a cost-justified safety enhancement.

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on.

Thank you.

The opportunity that we saw for improvement in the framework here is that there is not guidance for the level of oversight, if we do go down that path, to have oversight and verify and follow up and ensure that those activities that were accepted as a substitute are being effective and the intention of that follow-up is to feed back into the decision that

was made to not pursue the rulemaking.

So what we are proposing in this activity is to; the second sub-bullet, specify that for future industry initiatives that they may only be credited in the baseline case of the regulatory analysis of potential safety enhancements when there is a high likelihood that the industry will effectively implement and maintain the initiative over time. So the activity after this would be to discuss that further and explain. But the key words that we put in there is this high likelihood.

The third sub-bullet is to provide the guidance and revise the oversight processes to establish infrastructure, to verify the implementation and effectiveness of these future safety-significant industry initiatives that the NRC has accepted as a substitute for a regulated safety enhancement.

And the last sub-bullet is we're

recommending to review existing industry initiatives that substitute for regulated safety enhancements and to verify the implementation status of the most safety-significant initiatives at a small number of facilities. The number we put in the proposal is six to nine facilities. So that's part of what we're recommending.

And the expected product from would relevant internal activity be the staff quidance, reiterating that this is not acceptable for an issue of adequate protection. If it adequate protection, the requirement should be put in place. And it would also state that it would implement the policy and infrastructure for the NRC to oversee safety-significant future voluntary initiatives accepted in lieu of rulemaking examples of what we mean by quidance. And that would be updates to Management Directive 6.3 of the rulemaking process and also one or more inspection manual chapters. And then for each individual situation there would be a -- if we determine it's necessary, a temporary instruction would be developed for follow up. Also there might be an office-level instruction.

So an example of a possible outcome is in the mid-2000s for the rule to require backup power for

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hydrogen igniters. This is a long paragraph, so I won't read that, but the example is for the backup power for hydrogen igniters for Mark III and ice condensers. This is something that was brought up yesterday by one of the members to look into the closeout of Generic Safety Issue 189, which is what this is. So this is the example that we have in the paper already. We just put it into the slides here. This is the discussion that we have in the paper.

So that generic safety issue identified in the Activity 2 Risk-Informed 50.44, I think. and the direction to examine potential justified safety enhancements. This was one that a specific proposal turned into a generic safety issue and was examined for five or six years. And it came to ACRS several times and it was ultimately determined that the staff should pursue rulemaking. believe it was 2005 when the industry proposed sitespecific modifications these, Ι think. at facilities that have the ice condenser Mark III containments, and that this would accomplish a large amount of the safety benefit that the staff attributing to this performance-based rulemaking to require reliable power for this equipment.

And that proposal was factored into the

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regulatory analysis and accepted. And it was determined for the PWR ice condensers that if you assume that these voluntary actions will be effective, then the proposed rulemaking is not justified. But if you do not assume that, then it would be justified. So that's really the best example, actually the only example that I could find where this type of analysis was done for the BWR Mark IIIs that regardless of whether or not the voluntary actions were implemented, the rulemaking was not justified. And the conclusions is that the NRC expects that the actions will be taken.

And the last sentence, the failure of the voluntary actions to achieve the desired outcomes will cause the staff to revisit rulemaking. That's the last sentence in the decision rationale of the reg analysis for that activity.

So getting back to this example of how we think this improvement activity would help is that we believe if the improvement activity had been implemented at the time, that the industry initiative would have been credited only if the verification activities had been put in place. That's the example that we provide. Those are the only slides that I had for Improvement Activity 3. Are there any questions

as follow-up on that?

(No audible response.)

MR. DUDLEY: Okay. The next few slides are a comparison of our recommended improvement activities to the specific recommendations made by the Near-Term Task Force and called out and enumerated and some of the implicit recommendations that were also obvious from the text, although they were not enumerated or called out.

Recommendation 1 is to come forward with a logical consistent coherent framework for adequate protection. We believe all three of our improvement activities are relevant to contributing to a logical, consistent and coherent framework for adequate protection.

Activity 1 would bring result in rules and orders that are currently considered to be beyond-design-basis rules to meet new criteria that we would establish for a design basis extension category and have well-defined performance goals/treatment requirements as we've discussed with you previously.

Activity 2 would formalize by a Commission policy statement and implementing guidance an NRC defense-in-depth policy statement and philosophy with elements and decision criteria to support making

regulatory decisions.

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And Activity 3 would reaffirm that existing Commission policy that you cannot voluntary initiatives on matters of adequate protection and it would also provide for enhanced oversight of certain safety-significant industry initiatives that the NRC chooses to accept in lieu of pursuing with a regulation.

On slide 17 NTTF's Sub-Recommendation 1.1 is to promulgate a policy statement for risk-informed defense-in-depth for adequate protection. Our Improvement Activity 2 on defense-in-depth directly supports NTTF Recommendation 1.1 by having the defense-in-depth policy statement and criteria for adequacy, but we did differ slightly from NTTF in that we are not proposing to define adequate protection or to treat defense-in-depth as something that's only relevant to adequate protection.

Under NTTF Sub-Recommendation 1.2 they directed us to initiate rulemaking to implement this risk-informed defense-in-depth framework. We do not have an improvement activity that corresponds to this sub-recommendation because we believe we can implement the new category and the defense-in-depth policy statement without the need to undertake rulemaking.

And without undertaking rulemaking we think we can get the design basis extension category implemented sooner and use less resources in doing so.

Sub-Recommendation 1.3 is to modify the regulatory analysis quideline to more effectively implement defense-in-depth in balance with risk-based quidelines. Both Improvement Activities 2 and 3 contribute to Sub-Recommendation 1.3. The Req Analysis Guidelines under Improvement Activity 2 would be updated to incorporate criteria that would reflect defense-in-depth. And we would also update the Regulatory Analysis Guidelines under Improvement Activity 3 under voluntary initiatives to strengthen how the process that we would use to credit voluntary initiatives only when it's highly likely that they would be effectively implemented and maintained over time.

Sub-Recommendation 1.4 was to evaluate the insights of the IPE and the IPEEE evaluations and to look to find generic or plant-specific requirements, requirements which would then be added to this new category of regulations. We do not have an improvement activity that addresses evaluation of the IPEE and the IPEEE results. We did look into doing this and we looked all over for IPE information and we

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concluded that, you know, the IPEs and IPEEs are many years old and plants have evolved, and we believe that there's a low likelihood of identifying plant-specific or generic concerns and that we don't believe the resources to look into this would be justified. So we did not recommend an improvement activity for that sub-recommendation.

On slide 18 the other implicit recommendation is that voluntary safety initiatives by should not take the place of regulatory requirements. Improvement Activity 3 partially addresses this recommendation  $\mathsf{NTTF}$ proposing that we only would credit initiatives that are highly likely to be effectively implemented and maintained over time, and we would implement an oversight infrastructure confirm that these initiatives would continue to be effective over time.

And the final implicit recommendation is that our current regulatory approach with design basis requirements, beyond-design-basis requirements and voluntary initiatives has resulted in a patchwork of regulatory requirements and other voluntary initiatives. We believe that Improvement Activities 1 and 3 contribute to reducing the patchwork nature,

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although you can certainly never -- any regulatory system is going to have patchwork aspects to it, but we believe that by establishing the design basis extension category and specifying clear criteria for how to write those rules to ensure that they're thorough, coherent and consistent. We believe that reduces the patchwork aspect of our beyond-designbasis requirements, and by putting additional formal structure onto voluntary initiatives under Improvement Activity 3, we believe we also reduce the patchwork nature of our regulatory framework with Improvement So that is how we believe our Activity 3 also. Improvement Activities compare to the recommendations made by the Near-Term Task Force.

The next slide explains the relationship between NTTF Recommendation 1, our recommendations and findings, and the risk management regulatory framework proposed in NUREG-2150, another task force report. There are two improvement activities; Improvement Activity 1 on the design basis extension category and Activity 2 on defense-in-depth, that are closely related to recommendations that were made by the Risk Management Task Force in NUREG-2150.

For Improvement Activity on the design basis extension category, the approach that we're

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recommending to establish this category under Recommendation 1 is different from the approach that was recommended by the Risk Management Task Force. And in our paper we state that the proposed design basis extension category that we recommend could be viewed as an interim step before completion of the Risk Management Task Force's proposed risk management regulatory framework. We also note that Commission direction on Near-Term Task Force Recommendation 1; in other words the SRM that we get in response to the paper that we'll deliver on December 9th, will inform our approach for how we would go forward and implement a risk management regulatory framework which would certainly build upon the work that we've done and outlined in our recommended approach to Recommendation 1. The other improvement activity that was similar the Risk Management to Task Force recommendations was Improvement Activity 2 on defensein-depth, but for that improvement activity there was no conflict. Our proposed defense-in-depth approach under Recommendation 1 is entirely consistent with

MS. DROUIN: But the only thing that I would add is that the two sub-bullets up above, you

the Risk Management Task Force recommendations.

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know, where it says Commission direction on NTTF
Recommendation 1 will inform the staff's approach,
those words apply also for what's happening on
Improvement Activity 2.

MR. DUDLEY: Right. And the last slide that we have for you today is slide 20. And after the conclusion of the Full Committee today we are awaiting the letter from the ACRS. Obviously we would like it as early as possible, but I know there's a Monday holiday involved also. But we want to receive your letter. We will review it thoroughly and we will go over any points that you want to make and we'll discuss those points and issues and make decisions as to how we should modify or shouldn't modify our SECY based on those recommendations. And we'll discuss those changes with our Recommendation 1 Steering Committee in a meeting that we have scheduled for November 26th. That will allow us to get management approval and direction if necessary in order to complete the paper with any changes as appropriate, which we'd provide to the EDO by December 3rd. then the EDO is required, based on the schedule, to forward it to the Commission no later than December 9th.

So, Dr. Schultz, that is our presentation.

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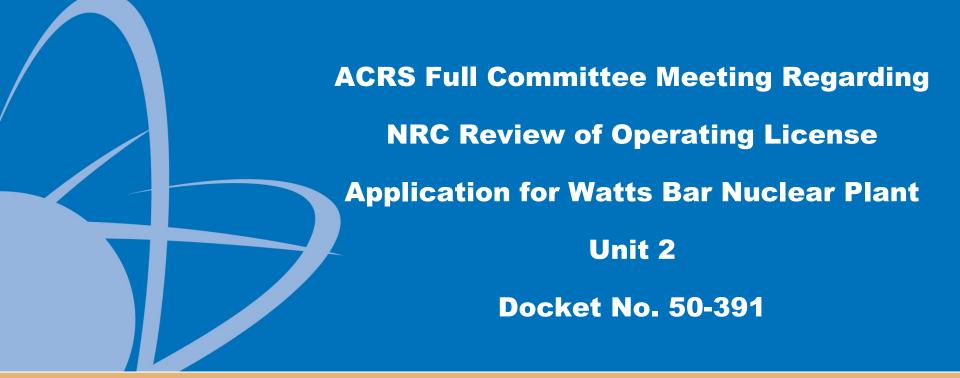
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1	If there are any other questions, we'd be glad to
2	answer them.
3	MEMBER SCHULTZ: Are there questions from
4	the members?
5	(No audible response.)
6	MEMBER SCHULTZ: Looking around thoroughly
7	and seeing now, I would like to thank the staff for
8	their presentations today. It's an excellent summary
9	of the discussions that we've had in the last
10	subcommittee on Tuesday.
11	And with that, I'll turn the program back
12	to you, Chairman Armijo, and give you some more time
13	for lunch.
14	CHAIRMAN ARMIJO: Well, we're a little
15	ahead of schedule. We've had two terrific management
16	sessions here.
17	Let's just hold to the planned schedule.
18	We'll reconvene at 1:45. That will give us a chance
19	to have a good lunch for once.
20	(Whereupon, the above-entitled matter went
21	off the record at 12:24 p.m.)
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## November 7, 2013

Office of Nuclear Reactor Regulation (NRR) – Justin Poole





# **Agenda Topics**

### TVA

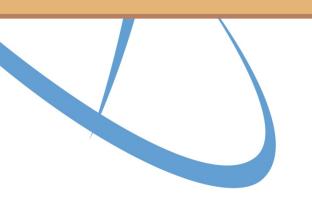
- Construction Completion Status Update
- Licensing
- Unit Differences

## NRC

- Background
- Scope of the Review
- Staff review to date
- Remaining Activities
- Inspection Status



# NRC Review of the Operating License Application for Watts Bar Nuclear Plant Unit 2



NRR - Justin Poole





# **Background**

- January 23, 1973 NRC issues CPs for WBN Units 1 & 2.
- September 27, 1976 -TVA applies for operating licenses (OLs) for Units 1 and 2.
- September 17, 1985 NRC requests information on TVA plans to address deficiencies in operating and construction activities.
  - Construction at the site suspended around this same time
- 1990 1995 TVA addresses WBN Unit 1 construction quality issues.
- February 7, 1996 TVA receives OL for Unit 1.



# Scope of Review for Unit 2

## SRM SECY-07-0096 of July 25, 2007

- Unit 1 current licensing basis as reference basis for licensing of Unit 2
  - Review any Unit 1 exemptions, reliefs, and other actions to determine whether the same allowance is appropriate for Unit 2
  - Significant changes to licensing approach allowed where backfit rule would be met or as necessary to support dual unit operation
  - Encourage updated standards for Unit 2 where it would not significantly detract from design and operational consistency between Units 1 and 2
  - Look for opportunities to resolve generic safety issues where unirradiated state of Watts Bar 2 makes the issue easier to resolve than at Watts Bar 1



## Scope of Review for Unit 2

- NRR Office Instruction LIC-110 "Watts Bar Unit 2 License Application Review"
  - Establishes the organization and roles and responsibilities
  - Details process work flow and management controls
  - Coordination of reviews conducted by other offices
  - Guides staff through process leading to issuance of OL
- NUREG-0847, Supplement 21
  - Provides baseline for remaining evaluation of WBN Unit 2
  - Original SER documented in NUREG-0847, June 1982
  - Supplements 1 through 4 dealt with Units 1 & 2
  - Supplements 5 through 20 focus primarily on licensing of Unit 1



## **Status of Operating License Application**

- TVA amendments to FSAR received (A92 to A109)
- Supplements to original Safety Evaluation Report
  - SSER 21 identifies regulatory framework
  - SSER 22 FSAR Chapters 2, 3, 5, 6, 8, 9, 10, 13, 14, 17
  - SSER 23 FSAR Chapters 4, 7
  - SSER 24 FSAR Chapters 2.4, 11, 12, 13.6.6, 15
  - SSER 25 FSAR Chapters 15.4
  - SSER 26 Fire Protection Report Review

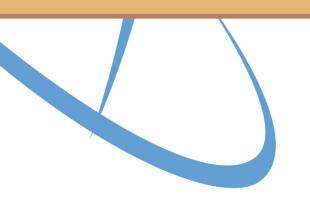


## **Status of Operating License Application**

- Instrumentation and Controls Review Chapter 7
  - Changes to safety related systems either portions (Eagle-21) or entire systems (Common Q PAMS) different from Unit 1
  - Changes to non-safety related systems and their possible impact to safety related systems
- Fire Protection Report Review
  - Enhanced or New Review Topics Operator Manual Actions and Multiple Spurious Operations
  - Significant Effort to reduce level of detail and improve SE from Unit 1
- Accident Analyses
  - In 5 areas the staff required either a re-analysis or for TVA to provide an analysis that was not performed as part of Unit 1



# Watts Bar Unit 2 Remaining Activities



NRR – Justin Poole





## **Expectations for Next ACRS Meetings**

- Tentatively May/June 2014
- Closure of Open Items
  - ACRS Subcommittee identified 8 Open Items for the staff to present upon closure. 7 remain Open.
    - OI 59 Compatibility of ESF system materials during LOCA
    - OI 61 Thermal conductivity degradation
    - OI 63 Eagle 21 testing 2-way communication
    - OI 91 CCS GDC 5
    - OI 93 Eagle 21 testing 2-way communication
    - OI 132 Boron Dilution (CLOSED 6/4/13 Sub Committee)
    - OI 133 Hydrology
    - OI 134 Hydrology
- Status of Fukushima Orders



## **Overall Project Completion**

- Future Milestones
  - Complete SER and ACRS Review
  - Closeout of Fukushima Orders
  - ASLB Decision Letter
  - Operational readiness assessment
  - Certification of as-built construction
  - Commission Meeting



# Watts Bar Nuclear Plant – Unit 2 Advisory Committee on Reactor Safeguards Briefing

November 7, 2013





Construction Completion Status Update

Ray Hruby

Licensing
 Gordon Arent

Technical Topics
 Frank Koontz, Bill Crouch

Closing Remarks
 Ray Hruby



## **Construction Completion Status Update**

### Wall WBN Unit 2 Construction Reactivation

- **Guiding Principles for Construction Completion** 
  - Ensuring public health and safety
  - Safe continued / uninterrupted operation of WBN Unit 1
  - Fidelity of the Unit 1 and Unit 2 Design Basis and physical operation
  - Maintaining a consistent, predictable, transparent process for completion and licensing



### Watts Bar Unit 2 - Construction Summary

- Project Completion Activities are Tracking Consistent with the Estimate to Complete (ETC)
- Safety
  - 22.7+ Million Hours without Lost Time Incident
  - Fiscal Year to Date Recordable Injury Rate (RIR) 0.33
  - Safety Conscience Work Environment
- Quality
  - Project Quality >97%
- Cost & Schedule
  - Cost and Schedule Adherence are Meeting Expectations



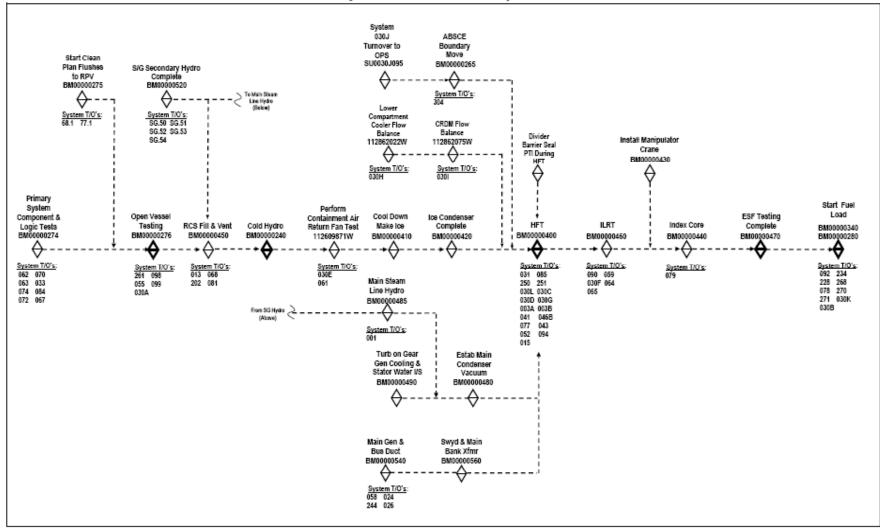
#### Watts Bar Unit 2 - Milestones Achieved

- Released Service Air system to Operations
- Open Vessel Testing milestone requires seven safety related systems
  - Released five safety related systems to startup for testing
    - System 67 Essential Raw Cooling Water
    - System 70 Component Cooling
    - System 72 Containment Spray
    - System 74 Residual Heat Removal
    - System 84 Flood Mode Boration
  - Remaining two safety related systems
    - System 62 Chemical and Volume Control
    - System 63 Safety Injection
- Developed a fully integrated project completion schedule

## TVA

### **Schedule and Critical Path**

#### WBN U2 Major Milestones with System Turnovers



R. Hruby



## Licensing

## TVA

## **Licensing Basis**

- Background
  - February 1996 Operating License for WBN Unit 1 issued
  - July 2000 TVA Formally Deferred WBN Unit 2
  - April 2007 WBN Unit 2 Key Assumptions
  - July 2007 Staff Requirements Memorandum



### Regulatory Framework – WBN Unit 2 Licensing

- Staff Requirements SECY-07-0096 Established Licensing Approach for Watts Bar Unit 2
  - License per 10 CFR 50
  - Unit 1 Licensing Basis is the Reference Basis for Unit 2
  - Evaluate Relief Requests, Exemptions, etc., Granted on Unit 1 for Unit 2 Applicability
  - "Backfit Rule" Could be Applied, if Required for Significant Changes
  - Adoption of New Standards Where Operational Consistency Not Impacted
  - Look for Opportunities to Resolve Generic Safety Issues While in an Unirradiated State



### Regulatory Framework – WBN Unit 2 Licensing

- Application/Implementation SECY-07-0096
  - License per 10 CFR 50
  - Unit 1 Design & Licensing Basis Used as Reference Basis for Unit 2
    - Exceptions
      - Obsolescence
      - Known Improvements (e.g., Fire Protection, Turbines)
  - Reliefs and Exemptions Addressed on a Case-by Case Basis
  - "Backfit Rule" Not Applied to Date
  - Licensing Basis Updates Provided Quarterly
  - Adoption of New Standards Affecting Unit 1 and Unit 2
    - Emergency Planning Rule
    - Cyber Security
    - o Fukushima
  - Implemented Opportunities for Improvement

## M Implemented Opportunities for Improvements

- Reduction of Appendix R Operator Manual **Actions**
- Eliminating Multiple Spurious Operations
- Replace All 8 Essential Raw Cooling Water Pumps to Improve Flow Margin
- Replacement of Piping Susceptible to Flow **Accelerated Corrosion**
- Ice Condenser Glycol Chiller Replacement
- Double 500 kV Breaker Arrangement in Switchyard
- Add Zinc Injection System for Reactor Coolant System and Steam Generator Passivation
- Digital Instrument and Controls Upgrades
- RG 1.200 Compliant PRA

- Retube Main Condenser
- **Intake Pumping Station Diver Barrier**
- Reactor Coolant System/Pressurizer Weld **Mechanical Stress Improvement Process**
- Additional Offsite Power Source
- Split Pin Replacement Prior to Operation
- Reduction of Pipe Support Snubbers
- Improvements to Containment Sump Performance
- Replacement of Safety Related Limitorque Motors
- **Turbine Upgrade**



## **Licensing Path Forward**

- Final Environmental Statement Complete
- Supplemental Safety Evaluation Reports 22 26 Issued
- Safety Evaluation Report ~99% Complete
  - Confirmatory Open Items Remain
- Closure of Regulatory Commitments Accelerating
- No WBN U2 Specific Contentions remain open

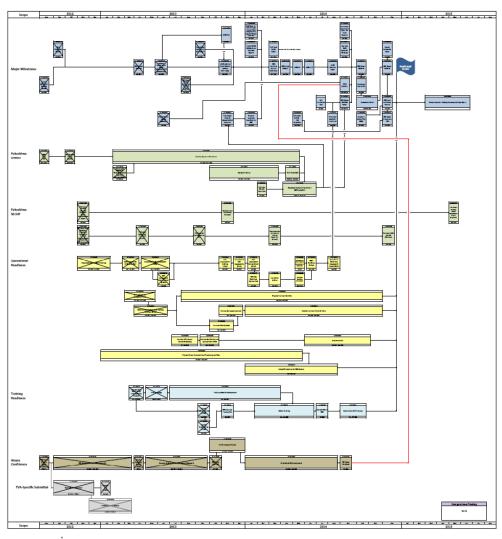
G. Arent



## **Licensing Path Forward**

#### LICENSING FUEL LOAD SCHEDULE

Based on December 2014 Fuel Load



G. Arent



## **Technical Topics**

## **M** Technical Topics

- Goal Minimize Physical Differences/Maximize Unit Fidelity
- Unit 2 Physical Differences
  - No Tritium Production
  - Original Steam Generators
  - No Feedwater Flow Measurement Uncertainty Recovery
  - Emergency Core Cooling System Sump Modification Prohibited
     Fiber Installation inside Containment
  - Equipment Replacement
    - Inadequate Core Cooling Monitor Common Q
    - Core Flux Monitoring WINCISE
    - Digital Instrument & Controls Upgrades
    - Turbine and Moisture Separator Reheaters Upgrades

## **M** Technical Topics – Chapter 15 Analyses

- Thermal Conductivity
  - Generic Industry Issue
  - U2 Specific Analyses Submitted to Staff to review.
- LBLOCA & SBLOCA have large margins to PCT Limit of 2200°F
  - ASTRUM vs. Earlier Best Estimate

### M Technical Topics – Chapter 15 Analyses

- New Analysis
  - Overpressure Protection on Second Safety-Related Trip
  - Chemical Volume Control System Malfunction that Increases Reactor Coolant System Inventory
  - Main Steam Line Break Analysis and Parameter Sensitivity Study
- Additional Analyses
  - Inadvertent Emergency Core Cooling System no Liquid Release from Power Operated Relief Valves
  - Boron Precipitation
  - Boron Dilution Modes 3, 4, 5

### M Technical Topics – Appendix R/Fire Protection

- WBN Fire Protection Report (FPR) Revision 5 Addressed Single Unit Operation and conformed to Appendix R. Sections III.G. III.J. III.L. and III.O
- NRC's Review of Unit 1 FPR Principally Documented in Appendix FF, "Safety Evaluation: Watts Bar Nuclear Plant Fire Protection Program," SSER 18 (October 1995) and SSER 19 (November 1995)
- FPR Later Updated (Revisions 6 thru 39) Consistent with Unit 1 Standard License Condition 2.F (Generic Letter 86-10)
- NRC's Review of Dual Unit FPR Principally Documented in Appendix FF, "Safety Evaluation: Watts Bar Nuclear Plant Fire Protection Program," SSER 26 (June 2013)

B. Crouch

## Technical Topics – Appendix R/Fire Protection

- Objective
  - Expand Existing Report to Address Dual Unit Operation
  - Maintain Consistency with Unit 1 Commitments
  - Incorporate Planned Unit 1 Upgrades
- Starting Point Existing Fire Protection Report (Revision 39)
- Incorporate Unit 2 Specific Equipment/Cables
  - Classic Fire Protection (Detection, Suppression, Separation, Emergency Lighting, etc)
  - Fire Safe Shutdown (Equipment/Cables, Functions, Locations, etc)
- Incorporate Upgrades
  - Multiple Spurious Operations
  - Operator Manual Action Reductions
  - Feasibility and Reliability Evaluation of Unit 2 & Common Operator Manual Actions

## **M** Technical Topics - Refurbishment

- Equipment Scope
  - Safety Related / Non-Quality Related
  - Active / Passive
- Refurbishment Program Process Steps
  - Identification
  - Classification
  - Inspection/Evaluation
  - Refurbishment/Replacement
  - Component/System Testing
- Required Outcome
  - Plant meets original licensing, design and equipment vendor specifications



## **Closing Remarks**



## **Questions**



## **Backup**

## TVA

#### **Fukushima**

- Designs for Fukushima Modifications are complete
- Construction of Flexible Equipment Storage Building has begun
- Construction of new Auxiliary Feedwater Storage Tank has begun
- Dominator Pumps, 225 KVA Diesel Generators (DGs) and 3 MW DGs are delivered
- Draft FLEX Procedures are approximately 50% complete
- Drafts of revisions to existing procedures are approximately 80% complete
- Programming changes to the simulator are underway
- Drafting of training modules for updated procedures has begun
- Full compliance expected early fall 2014



## Westinghouse INCore Information, Surveillance, and Engineering (WINCISE) System

- System Purpose
  - WINCISE is a Non Safety Related fixed core instrumentation system which provides mapping of neutron flux within the core in order to calculate power distribution.
  - The Incore Instrument Thimble Assemblies (IITA's) also contain the Core Exit Thermal Couples (CET) which are required for Post Accident Monitoring.



## Westinghouse INCore Information, Surveillance, and Engineering (WINCISE) System

- Background
  - Watts Bar Unit 1
    - Moveable Incore Detector System (MIDS)
      - 6 Rhodium Detectors
      - Controls and Recorders in Main Control Room (MCR)
    - Top Mounted Core Exit Thermocouples (CET)
      - 65 top mounted Type-K CETs
      - Reference Junction Box inside containment



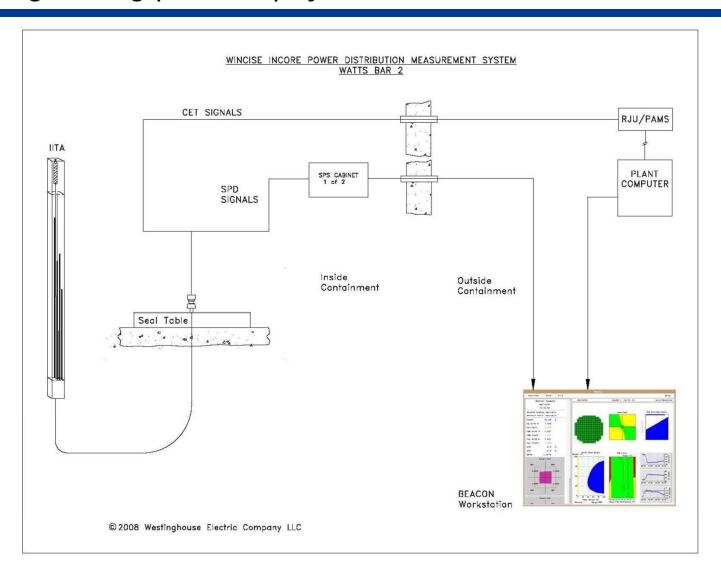
## Westinghouse INCore Information, Surveillance, and Engineering (WINCISE) System

- Watts Bar Unit 2
  - Fixed Incore Instrumentation
    - Main control room controls and recorders not required
    - Computers and hardware automate data collection
  - 58 Incore Instrument Thimble Assemblies (IITAs)
    - Each has 5 Vanadium Self Powered Detectors (SPD)
    - Each has 1 Type-K Core Exit Thermocouples (CET)
    - 29 Train A and 29 Train B

B. Crouch

## TVA

## Westinghouse INCore Information, Surveillance, and Engineering (WINCISE) System



### M Classic Fire Protection Features

- Dual Unit Program Features in Place Prior to Unit 1 Operation
  - Fire Operations/Fire Brigade
  - Equipment Surveillance Programs
  - Combustible Control/Ignition Source Control/Impairment Control Programs
- For Dual Unit Operation, Most Required Equipment Installed Prior to Unit 1 Operation
  - Detectors
  - Sprinklers/Hose Stations/Hydrants/CO<sub>2</sub>
  - Raceway Protection/Fire Dampers/Penetration Seals/Water Curtains
  - Emergency Lighting
  - Communications
- Unit 2 Additional Equipment
  - Reactor Building Annulus Detectors/Sprinklers
  - Fire Dampers
  - Emergency Lights
  - Penetration Seals
  - Reactor Coolant Pump Spray Shields
  - Reactor Coolant Pump Oil Collection System

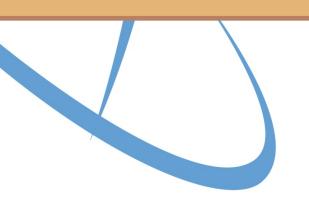
#### **IM** Summary of Compliance Table Excerpt

PART I – INTRODUCTION TABLE I-1 SUMMARY COMPLIANCE FIRE PROTECTION									
Room Number and Name	Safe Shutdown Equipment or Cables Y/N	Automatic Detection Y/N, Full/Partial	Automatic Suppression Y/N,Full/Partial	Fire Rated Wraps	Combustible Load, Fire Severity	Deviation Number in Part VII	Evaluation Number in Part VII	CSD Repairs req'd in any room due to fire in room	III.G Compliance for HSD
FIRE AREA 15-2:									
737.0-A12 – Unit 2 Heat and Vent Equipment Room	Yes	Yes, Full	Yes, Full	1 hour	< 25 minutes	2.4	3.4, 8.3.18 & 65		2c, 1-G, 2-G

B. Crouch 31



# Region II Presentation of Status of Construction Inspection Activities



RII – Robert Haag





#### **Construction Inspection Program**

- Same program that was used for all existing plants licensed under 10CFR Part 50
- Enhanced to address unique history of Unit 2
- 543 construction inspection items identified
- Historical inspection results factored into scope of current inspection effort



#### **Inspection Organization**

- Separate branch within RII's Division of Construction Program (DCP) devoted solely to Unit 2
- Four construction resident inspectors In addition to the Unit 1 operations resident inspectors
- Branch chief, team leader and three project inspectors in RII assigned to Unit 2
- 32 regional inspectors performed inspections in 2012



#### **Status of Inspection Activities**

- Closed 346 of the 543 construction inspection items
- Majority of remaining open items have been inspected
- Results of construction inspections
- Preparations for pre-operational testing inspections
- Current focus: Identify when remaining inspections can be performed and schedule the inspections



#### **Future Inspection Activities**

- Complete inspections for the 197 open items (17 items involve fire protection)
- Perform pre-operational testing inspections
- Perform operational preparedness inspections (radiation protection; security; fire protection) inspections
- Define and perform Fukushima inspections

# Fukushima Near Term Task Force (NTTF) Recommendation 1: Improved Regulatory Framework

NRC Staff Presentation to the Advisory Committee on Reactor Safeguards

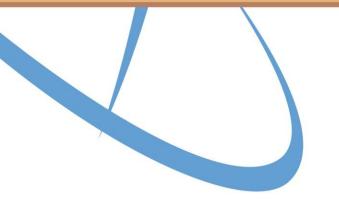
# Staff Proposals in Response to NTTF Recommendation 1

- In August 2011 Commission directed staff to provide its recommendation to disposition NTTF proposals in Recommendation 1
- Staff has identified 3 potential regulatory framework improvement activities
- Objective of SECY paper is to have Commission authorize use of staff resources to fully evaluate implementation approaches for these 3 activities:
  - Improvement Activity 1 Establish a design-basis extension category of events and associated regulatory requirements
  - Improvement Activity 2 Establish Commission expectations for defense-indepth
  - Improvement Activity 3 Clarify the role of voluntary industry initiatives in the NRC regulatory process
- Later, when the improvement activities are fully developed, staff will request further Commission approval to implement them



### **Improvement Activity 1:**

Establish a Design-Basis Extension Category of Events and Associated Regulatory Requirements



## Summary of Proposed Approach for Design-Basis Extension Category

Establish the design-basis extension category to address future safety issues in the following way:

- Identify issues/concerns as candidates for rulemaking
  - Generic issues program, ROP, reactor operating experience program, accident sequence precursor program, industry trends program, agency action review meeting, public petition processes
- Evaluate issues to determine need to promulgate a rule
  - Adequate protection (determination by Commission not affected by category)
  - Safety enhancement (use Regulatory Analysis guidelines, as updated)
- Develop criteria for issuing coherent, consistent, and complete designbasis extension rules via a public process; document criteria in publiclyavailable document
  - Treatment criteria, change process, FSAR update and documentation, training, analysis methods, acceptance criteria, etc.
- Implement criteria/process by amending internal staff guidance

## Summary of Proposed Approach for Design-Basis Extension Category

Other characteristics of proposed design-basis extension category:

- Maintain existing generic regulatory framework (does not require a plant-specific PRA)
- Applicable to current and future licensees and applicants
- "Grandfather" SBO, ATWS, 50.44, 50.54(hh), aircraft impact assessment rules (unchanged) as design-basis extension requirements
- Apply criteria for writing design-basis extension rules only to new/amended design-basis extension requirements
- Include ongoing design-basis extension rulemakings
  - 50.46a, risk-informed GSI-191 rule, Fukushima rules
- Low cost approach for NRC and licensees

### Possible Results of Improvement Activity 1 - Design-Basis Extension Category

#### Expected Products:

- Description of overall approach documented in publicly-available document providing detailed guidance and criteria for writing designbasis extension rules to ensure they are coherent, consistent, and complete
- Revisions to existing internal staff guidance to implement the approach
  - Management Directives, Office Instruction, Inspection Manual chapters

#### Example of Possible Outcome:

• If the design-basis extension category had been established when the NRC issued § 50.54(hh) on loss of large areas of the plant, rule would have been designated as a design-basis extension rule and the guidance to rulemaking staff would have ensured that the rule would contain quality requirements (which are not currently included in § 50.54(hh)).

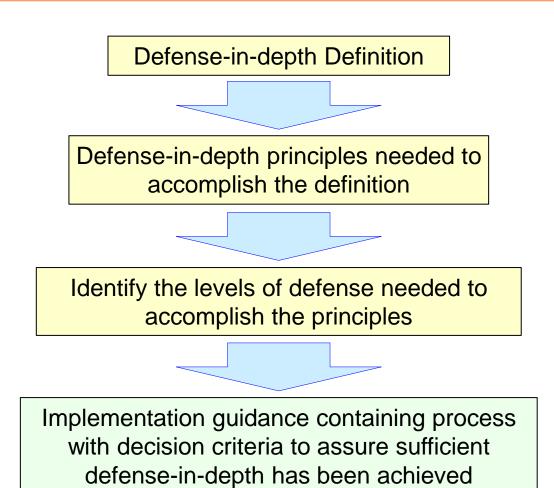


# Summary of Improvement Activity 2 on Defense-in-Depth

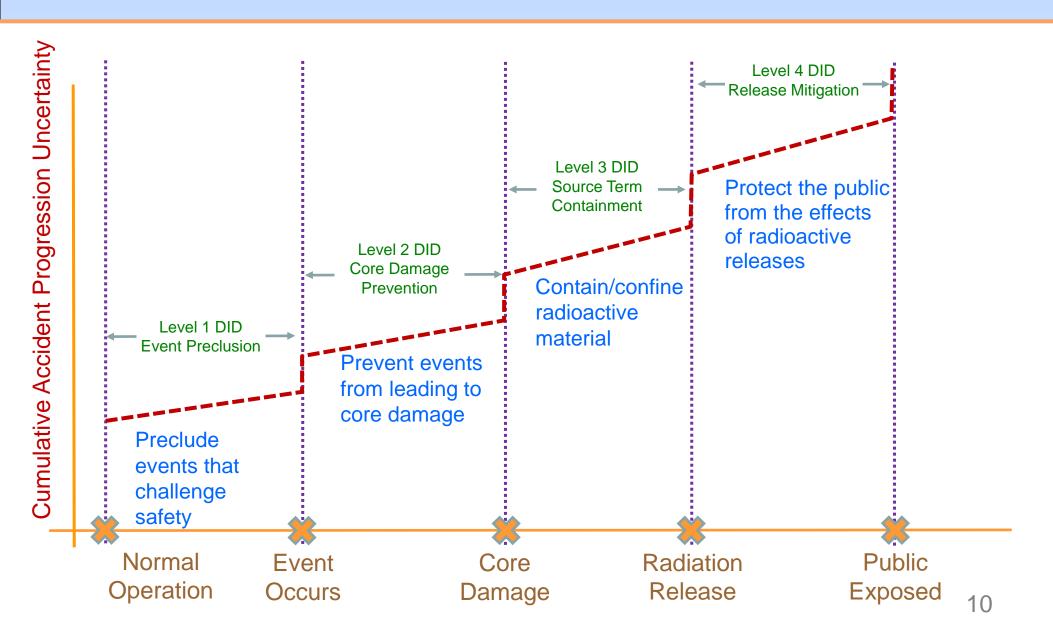
- SECY paper recommends Commission approve development of reactor policy statement on DID and associated implementation guidance
- Paper provides examples what may be, for reactors
  - A DID structure
  - A DID definition
  - A set of DID principles
  - A set of levels of defense
  - A DID decision process
  - A set of DID decision criteria
- NRC staff will not develop the above until the Commission approves moving ahead with a DID policy statement
  - Stakeholder and ACRS input will be sought
- DID criteria would also be incorporated into the Regulatory Analysis guidelines to ensure that future power reactor rulemakings consider DID

# Staff's Proposed Approach to Defense-in-Depth

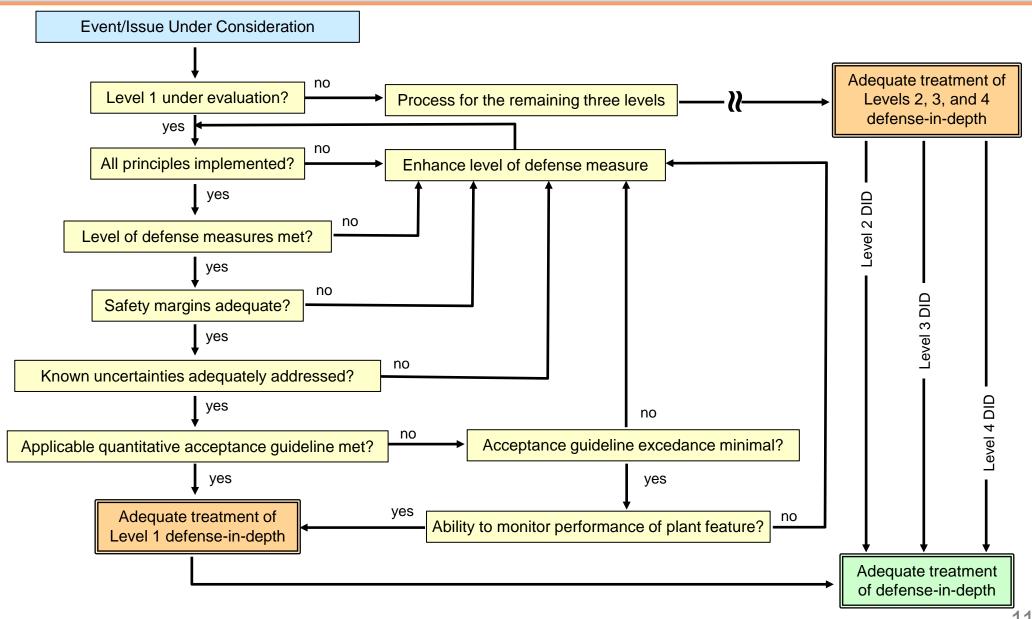
- Recommends that policy statement be developed in a logical, systematic manner to
- Defense-in-depth approach will be based on a hierarchical structure



## Nuclear Power Reactor Defense-in-Depth May Consist of Four Levels



### **Draft Example** Decision Process



## Possible Results of Improvement Activity 2 – Defense-in-Depth

#### **Expected Products:**

- Development and issuance of a power reactor defense-in-depth policy statement and implementing guidance
- Revisions to existing internal staff guidance to implement the policy
  - Management Directives, Office Instructions, etc.
- Incorporation of DID criteria into the Regulatory Analysis guidelines to influence future decisions on power reactor rulemakings

#### **Example of Possible Outcome:**

If Improvement Activity 2 had been implemented prior to NRC's recent deliberations on filtered vents for Mark I and II containments, the containment designs would have been evaluated for defense-in-depth considerations in accordance with the approved DID policy and criteria. The NRC may have been able to more efficiently make its decision on the issue. Having previously established DID decision criteria would have improved the transparency and predictability of the NRC's regulatory process.



### **Improvement Activity 3**

Clarify the role of voluntary industry initiatives in the NRC regulatory process

# Summary of Proposed Approach for Improvement Activity 3 on Voluntary Initiatives

#### Activity 3 would:

- Re-affirm the Commission's expectation that industry initiatives may not be used in lieu of NRC regulatory action on adequate protection issues
- Specify that *future* industry initiatives may only be credited in the baseline case for regulatory analysis of potential safety enhancements when there is a high likelihood that the industry will effectively implement and maintain the initiative over time
- Provide guidance and revise oversight processes (inspections, audits) to establish infrastructure to verify the implementation and effectiveness of *future* safety significant industry initiatives which the NRC accepts as a substitute for a regulated safety enhancement
- Review existing industry initiatives that substitute for regulated safety enhancements and verify implementation status of the most safety significant initiative(s) at 6 9 facilities

## Possible Results of Improvement Activity 3 – Voluntary Initiatives

#### **Expected Products:**

- Update relevant internal staff guidance to (1) reiterate that voluntary initiatives are not acceptable for adequate protection issues, and (2) implement policy and infrastructure for the NRC to oversee future safety-significant voluntary initiatives accepted in lieu of rulemaking
  - Management Directive 6.3, "The Rulemaking Process"
  - Inspection Manual chapter(s)
  - Inspection program guidance (Temporary Instruction) or Office-level instruction describing options for oversight of a particular initiative

#### Example of Possible Outcome:

When the NRC considered issuing a rule requiring Mark III and ice condenser containments to provide backup power to hydrogen igniters, industry voluntarily proposed to install a rudimentary backup power system that substantially relied upon operator manual actions. When performing the backfit analysis by crediting this proposed initiative in the baseline case of the value/impact analysis, the benefits of the staff's proposed rule were reduced and the staff could not find that there was a "substantial increase" in protection to public health and safety, or that the proposed rule was cost-effective. Had Improvement Activity 3 been implemented at the time, the industry initiative would have been credited only if verification activities (e.g., NRC inspections, reporting requirements, etc.) had been put in place.

## Comparison of Improvement Activities to NTTF Recommendations

NTTF Recommendation	Relevant Improvement Activities	Remarks
Logical, consistent, coherent framework for adequate protection	1, 2, 3	Each of the three proposed improvement activities provides additional regulatory clarity, predictability, reliability, and efficiency over the current framework as currently implemented.
		Activity 1 would result in rules and orders currently considered to be "beyond design basis" to clearly specify well-defined performance goals, treatment requirements, documentation and change control requirements, and reporting requirements.
		Activity 2 would formalize by Commission Policy Statement and implementing guidance the defense-in- depth philosophy, elements and decision criteria to support regulatory decisions.
		Activity 3 would re-affirm the existing Commission policy that industry initiatives may not be used in lieu of NRC regulatory action where a question of adequate protection of public health and safety exists. It will also provide graded oversight of Type 2 industry initiatives.

## Comparison of Improvement Activities to NTTF Recommendations

NTTF Recommendation	Relevant Improvement Activities	Remarks
1.1 Policy statement for risk- informed defense-in-depth (adequate protection)	2	Activity 2 directly supports risk-informed decisions by developing decision criteria to assess defense-in-depth adequacy. The staff does not propose defining adequate protection, or to treat defense-in-depth as relevant only to adequate protection.
1.2 Initiate rulemaking to implement a risk-informed defense-in-depth framework consistent with policy statement in 1.1	None	The staff is recommending a defense-in-depth Policy Statement and implementing guidance. A defense-in-depth regulation is not needed for transparency or consistent NRC decision-making if a Policy Statement and implementing guidance are adopted.
1.3 Modify Regulatory Analysis Guidelines to more effectively implement defense-in-depth in balance with risk-based guidelines	2, 3	The Regulatory Analysis Guidelines would be updated to include defense-in-depth criteria. The guidance would also be changed to strengthen the cost-benefit section regarding how Type 2 industry initiatives are credited.
1.4 Evaluate the insights IPE and IPEEE for generic or plant-specific requirements	None	This recommendation is not addressed by the staff's proposed improvement activities. The staff concluded that the low likelihood of identifying plant-specific design or operational safety concerns would not support the resources (staff and industry) that would be expended in this activity.

## Comparison of Improvement Activities to NTTF Recommendations

NTTF Recommendation	Relevant Improvement Activities	Remarks
Voluntary safety initiatives by licensees should not take the place of needed regulatory requirements. (NTTF Report, pp. 19, 21)	3	Activity 3 partially addresses this NTTF comment by proposing that Type 2 industry initiatives not be credited in the baseline case as defined in the Regulatory Analysis Guidelines unless there is a high likelihood that the industry will effectively implement and maintain the initiative over time.
The current NRC regulatory approach (requirements for design-basis events, beyond design-basis events, and voluntary initiatives) has resulted in a "patchwork" of regulatory requirements and other safety initiatives.	1, 3	Design basis events, and especially design basis accidents, are acceptably addressed in the current regulatory structure and are well-understood by various stakeholders.  Improvement Activity 1 addresses the NTTF observation regarding "beyond design-basis events"  Improvement Activity 3 adds formal structure and NRC oversight to address the NTTF issue with voluntary industry initiatives.

# Relationship between NTTF Recommendation 1 and RMRF

- Improvement Activity 1 (design-basis extension category) and Improvement Activity 2 (defense-in-depth) are closely related to certain RMTF recommendations in NUREG-2150
- For Improvement Activity 1 (design-basis extension category):
  - Staff's proposed approach to establish the design-basis extension category in response to Recommendation 1 differs from RMTF's recommended approach
  - Recommendation 1 SECY paper states:
    - Proposed design-basis extension category could be an interim step before completion of RMTF's proposed Risk-Management Regulatory Framework
    - Commission direction on NTTF Recommendation 1 will inform the staff's approach for implementation of an RMRF, which will build upon the approach outlined in Recommendation 1.
- For Improvement Activity 2 (defense-in-depth):
  - Staff's proposed defense-in-depth approach under Recommendation 1 is consistent with RMTF recommendations

## Status and Next Steps

- Nov. 7, 2013 ACRS full committee meeting
- Nov. 15, 2013 Receive ACRS letter (if possible)
- Nov. 26, 2013 Final Rec. 1 Steering Committee briefing
  - Discuss ACRS feedback/recommendations and modify SECY as appropriate
- Dec. 3, 2013 Provide to SECY paper to EDO
- Dec. 9, 2013 SECY paper due to Commission