



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
WASHINGTON, DC 20555 - 0001**

January 17, 2018

MEMORANDUM TO: ACRS Members

FROM: Quynh Nguyen, Senior Staff Engineer */RA/*  
Technical Support Branch, ACRS

SUBJECT: CERTIFIED MINUTES OF THE ACRS REGULATORY POLICIES AND  
PRACTICES SUBCOMMITTEE MEETING ON NOVEMBER 15, 2017

The minutes of the subject meeting were certified on January 11, 2018, as the official record of the proceedings of that meeting. Copies of the certification letter and minutes are attached.

Attachments: As stated

cc w/ att. A. Veil  
M. Banks



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
WASHINGTON, DC 20555 - 0001**

**MEMORANDUM TO:** Quynh Nguyen, Senior Staff Engineer  
Technical Support Branch, ACRS

**FROM:** Walter Kirchner, Chairman  
Regulatory Policies and Practices Subcommittee

**SUBJECT:** CERTIFICATION OF THE MINUTES OF THE REGULATORY  
POLICIES AND PRACTICES SUBCOMMITTEE MEETING ON  
NOVEMBER 15, 2017

I hereby certify, to the best of my knowledge and belief, that the minutes of the subject meeting are an accurate record of the proceedings for that meeting.

**/RA/**

**January 11, 2018**

---

Walter Kirchner, Chairman  
Regulatory Policies and  
Practices Subcommittee

Dated

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
MINUTES OF THE REGULATORY POLICIES & PRACTICES SUBCOMMITTEE MEETING  
NOVEMBER 15, 2017

The ACRS Regulatory Policies and Practices Subcommittee held a meeting on November 15, 2017 in T2-B1, 11545 Rockville Pike, Rockville, Maryland. The meeting convened at 8:30 AM and adjourned at 10:39 AM.

The entire meeting was open to the public.

No written comments or requests for time to make oral statements were received from members of the public related to this meeting.

ATTENDEES

ACRS Members/Consultants/Staff

WALTER L. KIRCHNER, Chairman  
RONALD G. BALLINGER, Member  
DENNIS C. BLEY, Member  
CHARLES H. BROWN, JR. Member  
MICHAEL L. CORRADINI, Member\*  
DANA A. POWERS, Member  
HAROLD B. RAY, Member\*  
PETER RICCARDELLA, Member  
GORDON R. SKILLMAN, Member  
JOHN W. STETKAR, Member  
MATTHEW SUNSERI, Member  
JOSE MARCH-LEUBA, Member

Designated Federal Official:  
QUYNH NGUYEN

Other Participants:

FRANK AKSTULEWICZ, NRO  
JOSEPH COLACCINO, NRO  
ALLEN FETTER, NRO  
DON SAFER, Public Participant\*  
RAYMOND SCHIELE, TVA  
DANIEL STOUT, TVA  
MALLECIA SUTTON, NRO  
JACK CUSHING, NRO  
JOSEPH ANDERSON, NSIR

WEIJUN WANG, NRO  
 BRUCE MUSICO, NSIR  
 NICHOLAS SAVWOIR, NRO  
 DAN BARRS, NSIR  
 ANTHONY WILSON, OGC  
 CJ FONG, Chairman's Office  
 PROSANTA CHOWDHURY, NRO  
 YUAN CHENG, NRO  
 DAVID MUSICK, FEMA  
 ALEX YOUNG, TVA  
 BILL EBORST, FEMA  
 ANTHONY DEFELICE, FEMA

\*Present via telephone

## SUMMARY

The purpose of this meeting is a preliminary overview of Tennessee Valley Authority's (TVA) Clinch River Early Site Permit (ESP) application and a discussion of the ESP process. The meeting transcripts are attached and contain an accurate description of each matter discussed during the meeting. The presentation slides and handouts used during the meeting are attached to these transcripts.

SIGNIFICANT ISSUES	
Issue	Reference Pages in Transcript
Member Skillman asked why this plant parameter envelope (PPE) is geared towards small modular reactors (SMR). Mr. Stout of TVA stated that this demonstration-driven project is also technologically-innovative.	10-13
Chairman Kirchner asked if the site was essentially home to the prior Clinch River Breeder Reactor. Mr. Stout stated that most previous information was not used in developing the ESP.	14
Two contentions associated with the ESP: 1) the claim that the environmental report had not assessed the impacts of a spent fuel pool fire and (2) the claims that the environmental report includes too much information about SMR features that is inappropriate language in an environmental report.	15-16, 41-42
To date, TVA has supported three audits: 1) hydrology, 2) seismic geotech and 3) environmental.	16

Member Skillman asked about potential flooding with dam failure. TVA said that Clinch River is considered a dry site. Member Skillman also asked about residential areas in proximity of the site.	25-28, 46
Member Corradini and Chairman Kirchner discussed the plant parameter envelope.	29-34
Member Skillman asked if Part 50 versus Part 52 should be used in this application due to established regulatory knowledge.	34-37, 51-54
Member Sunseri asked about a quality assurance program for the ESP.	37
Chairman Kirchner asked about emergency planning zones (EPZs) and the associated dose-based EPZs rulemaking activities.	37-41, 55-61
The draft environmental impact statement (EIS) is expected to be published in June 2018.	66
In response to Chairman Kirchner's question, external stakeholders will get an opportunity to intervene if the selected technology exceeds the bounding plant parameters.	69-70
In regard to multi-unit plants and their source term, Chairman Kirchner asked how the dose-based EPZ is established.	71-76
The staff stated that a safety evaluation with no open items is expected around June 2018.	81
Member Ray stated his support for the ESP process.	83
Mr. Safer of the Tennessee Environmental Council makes a statement offering his perspectives on the contentions.	85

#### Documents provided to the Subcommittee

1. "Nuclear Power Plant Licensing Process," Rev. 2, NUREG/BR-0298, July 2004.
2. "Industry Guideline for Developing a Plant Parameter Envelope in Support of an Early Site Permit," NEI 10-01, Rev. 0, March 2010 (ML101050329).
3. Letter to Ronald L. Simard (NEI), "Resolution of Early Site Permit Topic 6 (ESP-6), Use of Plant Parameter Envelope (PPE) Approach", From J. E. Lyons, Director, New Reactor Licensing Project Office, Office of Nuclear Reactor Regulation, February, 5, 2003. (ML030230071).
4. M. Scott, "Processing Applications for Early Site Permits," RS-002, May 2004 (ML040700094).

# **Official Transcript of Proceedings**

## **NUCLEAR REGULATORY COMMISSION**

Title:                   Advisory Committee on Reactor Safeguards  
                              Regulatory Policies and Practices Subcomm.

Docket Number:     (n/a)

Location:             Rockville, Maryland

Date:                  Wednesday, November 15, 2017

Work Order No.:     NRC-3363

Pages 1-89

NEAL R. GROSS AND CO., INC.  
Court Reporters and Transcribers  
1323 Rhode Island Avenue, N.W.  
Washington, D.C. 20005  
(202) 234-4433

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

+ + + + +

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

+ + + + +

REGULATORY POLICIES AND PRACTICES SUBCOMMITTEE

+ + + + +

WEDNESDAY

NOVEMBER 15, 2017

+ + + + +

ROCKVILLE, MARYLAND

+ + + + +

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

COMMITTEE MEMBERS:

WALTER L. KIRCHNER, Chairman

RONALD G. BALLINGER, Member

DENNIS C. BLEY, Member

CHARLES H. BROWN, JR. Member

MICHAEL L. CORRADINI, Member\*

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

JOSE MARCH-LEUBA, Member

DANA A. POWERS, Member

HAROLD B. RAY , Member\*

PETER RICCARDELLA, Member

GORDON R. SKILLMAN, Member

JOHN W. STETKAR, Member

MATTHEW SUNSERI, Member

DESIGNATED FEDERAL OFFICIAL:

QUYNH NGUYEN

ALSO PRESENT:

FRANK AKSTULEWICZ, NRO

JOSEPH COLACCINO, NRO

ALLEN FETTER, NRO

DON SAFER, Public Participant\*

RAYMOND SCHIELE, TVA

DANIEL STOUT, TVA

MALLECIA SUTTON, NRO

\*Present via telephone



## C-O-N-T-E-N-T-S

	<u>Page</u>
Welcome	
Walter Kirchner, Chairman.....	4
Frank Akstulewicz.....	8
Early Site Permit - Overview from TVA	
Dan Stout.....	9
Ray Schiele.....	17
Early Site Permit - Overview from Staff	
Joseph Colaccino.....	44
Allen Fetter.....	46
Mallecia Sutton.....	67
Adjourn.....	89

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

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

(8:30 a.m.)

CHAIRMAN KIRCHNER: Good morning. The meeting will now come to order. This is a meeting of the Regulatory Policies and Practices Subcommittee of the Advisory Committee on Reactor Safeguards.

I am Walt Kirchner, Chairman of this Subcommittee meeting. ACRS members in the room are Ronald Ballinger, Pete Riccardella, Dick Skillman, Dana Powers, Matt Sunseri, Dennis Bley, our Chairman, John Stetkar, Jose March-Leuba, and Charles Brown.

I believe we have on the phone Mike Corradini and Harold Ray.

MEMBER RAY: Here.

MEMBER CORRADINI: Correct.

MEMBER RAY: Yes.

CHAIRMAN KIRCHNER: Good morning. Harold is on Pacific time, so thank you, Harold.

MEMBER RAY: I think Mike is Denver if I understood it correctly.

CHAIRMAN KIRCHNER: Quynh Nguyen of the ACRS staff is the designated federal official for this meeting. The Subcommittee will hear from representatives of TVA and the staff regarding a preliminary overview of TVA's Clinch River early site

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

(202) 234-4433

(202) 234-4433

1 permit application and a discussion of the early site  
2 permit process.

3 The Subcommittee will gather information,  
4 analyze relevant issues and facts, and formulate  
5 proposed positions and actions as appropriate for  
6 deliberation by the Full Committee.

7 The ACRS was established by statute and is  
8 governed by the Federal Advisory Committee Act, FACA.

9 This means that the Committee can only speak through  
10 its published letter reports.

11 We hold meetings to gather information to  
12 support our deliberations. Interested parties who  
13 wish to provide comments can contact our offices  
14 requesting time after the meeting announcement is  
15 published in the Federal Register.

16 With that said, we also set aside some  
17 time for spur of the moment comments from members of  
18 the public attending or listening to our meetings.  
19 Written comments are also welcome.

20 In regard to the early site permits 10 CFR  
21 52.23 provides that the Commission shall refer a copy  
22 of the application to the ACRS and the Committee shall  
23 report on those portions which concern safety.

24 The ACRS section of the USNRC public  
25 website provides our charter, bylaws, letter reports,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 and full transcripts of all Full and Subcommittee  
2 meetings, including slides presented at the meetings.

3 The rules for participation in today's  
4 meeting were published, were previously announced in  
5 the Federal Register. We have received no written  
6 comments or requests for time to make oral statements  
7 from members of the public regarding today's meeting.

8 We have a bridge line established for  
9 interested members of the public to listen in. To  
10 preclude interruption of the meeting the phone bridge  
11 will be placed in the listen-in mode during the  
12 presentations and Committee discussions.

13 We will unmute the bridge line at a  
14 designated time to afford the public an opportunity to  
15 make a statement or provide comments.

16 At this time I would request that meeting  
17 attendees and participants silence their cell phones  
18 and any other electronic devices that are audible.

19 A transcript of the meeting is being kept  
20 and will be made available as stated in the Federal  
21 Register notice. Therefore, we would request that  
22 participants in the meeting use the microphones  
23 located throughout the meeting room when addressing  
24 the Subcommittee.

25 The participants should first identify

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 themselves and speak with sufficient clarity and  
2 volume so that they may be readily heard and make sure  
3 that the green light at the bottom of your microphone  
4 is on before speaking and off when not in use.

5 And now we will proceed with the meeting  
6 and I will call on Frank Akstulewicz, Senior Manager  
7 of the New Reactors Office, to begin. Frank?

8 MR. AKSTULEWICZ: Thank you, Chairman. I  
9 appreciate the opportunity to address the Committee  
10 today. My remarks will be brief.

11 I don't intend to occupy a lot of time,  
12 but I do want to on behalf of the staff appreciate the  
13 time that the Committee is making available for this  
14 informational briefing.

15 Nothing today will indicate any  
16 conclusions or findings about the process as we go  
17 forward, it's designed to kind of provide an  
18 opportunity for the Committee to ask the necessary  
19 process questions about scope or detail that the staff  
20 will examining the application during its review.

21 We will present to you the schedule for  
22 when we will be ready to come to the Committee with  
23 our findings on the technical subject matter and we  
24 will be available to answer any questions that you  
25 have today.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

(202) 234-4433

(202) 234-4433

1                   So with that my remarks are finished and I  
2                   turn the meeting back to you, sir.

3                   CHAIRMAN KIRCHNER:    Thank you, Frank.  
4                   Let's see, let us now turn to Dan Stout and Ray  
5                   Schiele of TVA to make their presentation.    Good  
6                   morning, gentleman, please proceed.

7                   MR. STOUT:    Good morning.

8                   (Off the record comments)

9                   MR. STOUT:    Thank you.    Good morning.    I  
10                  am happy to be here and provide an overview and  
11                  information about the early site permit process and  
12                  some details about the Clinch River site.

13                  By way of background, I served in the Navy  
14                  and I worked 15 years in the uranium enrichment  
15                  industry, I worked in the Department of Energy for a  
16                  few years, and have been with TVA for about eight  
17                  years, working on the small module reactor for about  
18                  five years.

19                  And Ray here also served below the waves  
20                  and has worked in the commercial nuclear industry for  
21                  a long time.    He is the licensing manager on this  
22                  project.

23                  And we'll move into the first slide.    So  
24                  our early site permit application addresses site  
25                  suitability for potential construction and operation

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 of a small modular reactor nuclear power plant.

2 The early site permit application  
3 contained more than 8000 pages, more than ten times  
4 that in reference materials, and, you know, the meat  
5 of it consists of the Site Safety Analysis Report, the  
6 Environmental Report, other areas of interest include  
7 Part 5, the Emergency Plans, and the Exemptions.

8 We based our plant parameter envelope that  
9 is used in the early site permit application on input  
10 we received from the four U.S. lightwater reactor SMR  
11 designs, and that consists of Holtec, B&W mPower,  
12 BWXT's mPower, NuScale, and Westinghouse.

13 So that input informed our plant parameter  
14 envelope. It's bigger than that, it encompasses that  
15 design input, but an early site permit plant parameter  
16 envelope could accommodate another reactor. It's the  
17 parameters that are being put forward.

18 We do assume that we would be deploying  
19 two or more of the technology that is ultimately  
20 selected. The maximum size of a unit, 800 megawatts  
21 thermal, for the site plant parameter envelope being  
22 2420 megawatts thermal or 800 megawatts electric.

23 So, you know, doing the math going back,  
24 you know, it could accommodate four Holtec, four  
25 mPower, three Westinghouse, or 12 NuScale.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1           Next. So the application is organized  
2 consistent with regulatory guidance and the Standard  
3 Review Plan. Next. So, you know, as we built the  
4 application as expected we used contractors to support  
5 us.

6           Bechtel was the lead on the Site Safety  
7 Analysis Report, with some exceptions. Demography was  
8 supported by Enercon, meteorology, a combination of  
9 Enercon of TVA, flooding, Barge Waggoner, seismic and  
10 geotech a combination of Bechtel, URS, and Rizzo, and,  
11 you know, TVA performed Chapter 13 and 17.

12           The Environmental Report, the lead was  
13 AECOM. We did have some minor roles, support  
14 contractors, for example, McCallum-Turner supported on  
15 a siting study.

16           Emergency Plans were supported by Enercon,  
17 the enclosures, Bechtel. There was some withheld  
18 information, TVA did that. That would be related to  
19 things like identifying specific locations of cultural  
20 resources, things like that. Next.

21           MEMBER SKILLMAN: Dan, let me ask this  
22 question. I am Dick Skillman. You are very clear  
23 that the plant parameter envelope was selected based  
24 on a collage of the four currently recognized SMR  
25 designs.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1           This is not intended to be a pejorative  
2 question, it's a curiosity question, why didn't you  
3 simply say we'd like to put 2500 or 3000 electrical  
4 megawatts on that site, whatever the number is that  
5 you would choose, and use classical that is understood  
6 by the other large ESP applications, use those plant  
7 parameters?

8           In other words, what is unique in your  
9 choosing the plant parameter envelope solely based on  
10 existing SMR thinking?

11           MR. STOUT: Great question. You know, one  
12 of the reasons that we are pursuing small modular  
13 reactors is at a higher level, you know, TVA supports  
14 technology innovation, you know, advanced reactors  
15 that are safer, that have more flexibility in terms of  
16 siting, in terms of operability, the kind of thing  
17 that we would like to have options for future  
18 deployment, and so we deliberately targeted deployment  
19 of SMR not deployment of 2000 megawatts.

20           So this is, you know, if you go to our  
21 environmental report and the purpose and needs  
22 statement is to demonstrate SMR technology and the  
23 ability to incrementally deploy, the ability to  
24 realize and demonstrate some of these safety features,  
25 the ability to support the Department of Energy, one

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 of the key customers that is located right beside us  
2 with features that you have to design that, you know,  
3 could accommodate underground transmission to them to  
4 increase the Department of Energy's reliability,  
5 resiliency for important loads to them, things like  
6 that.

7 So that was built in and designed up  
8 front, and, frankly, if you go to our integrated  
9 resource plan at TVA we don't need a bunch of  
10 megawatts in the Oak Ridge vicinity, so this is a  
11 demonstration-based project.

12 MEMBER SKILLMAN: Daniel, thank you.

13 MR. STOUT: Yes, sir.

14 MEMBER SKILLMAN: Thanks.

15 MEMBER RICCARDELLA: Could you accommodate  
16 a non-LWR?

17 MR. STOUT: In theory, yes, but I would  
18 expect that if you looked at a non-lightwater reactor  
19 and analyzed it against the parameters that there  
20 would be certain source term elements that aren't  
21 bounded and, therefore, you would have to re-analyze.

22 But we didn't have enough information on  
23 any non-lightwater designs. We were looking at risks,  
24 timing, et cetera, and made the decision to focus on  
25 getting the input from the lightwater reactor vendors

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 that were further along in their design and able to  
2 answer our questions and feed into the development of  
3 the plant parameter envelope template, you know, so  
4 that was the logic.

5 CHAIRMAN KIRCHNER: Dan, just on Pete's  
6 question going back, you know, in previous times, this  
7 is essentially the same site that was identified for  
8 the Clinch River Breeder Reactor, right?

9 MR. STOUT: Correct.

10 CHAIRMAN KIRCHNER: Is there any residual  
11 information from that that's relevant to your  
12 application or you just started, assumed a, pardon my  
13 saying a green field, and start over again from  
14 scratch?

15 MR. STOUT: Great question. Yes, I don't  
16 have anything in this presentation to talk about that,  
17 but the status of the breeder reactor, they had  
18 excavated the hole and had begun doing some of the  
19 base mat work when that project ended and -- There was  
20 a lot of work done by DOE in that timeframe, core  
21 borings, for example.

22 But we didn't have the pedigree, the QA  
23 controls over the core borings, for example, we  
24 couldn't put it all together, and so we used that  
25 information to inform our boring plan, but we didn't

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1       rely on those --

2                   CHAIRMAN KIRCHNER: Boring did that, yes.

3                   MR. STOUT: -- so it's been helpful, there  
4       is a lot of characterization, but it's not relied upon  
5       in the early site permit application.

6                   CHAIRMAN KIRCHNER: Thank you.

7                   MR. STOUT: Yes. So this is on Slide 6, a  
8       chronology of TVA's SMR development activities. Work  
9       began back in 2009. At that time TVA had agreed to  
10      align with B&W and pursue a construction permit  
11      application for mPower reactors.

12                   And so the site characterization work  
13      kicked off the following year, 2010, 2014 B&W decided  
14      to slow down its spending and TVA decided to pursue  
15      this technology neutral early site permit approach.

16                   It was a way to continue to advance  
17      development of small modular reactors without being  
18      locked in on the pace of development of a specific  
19      vendor.

20                   And our application was submitted to the  
21      NRC in May. There was a robust review process in  
22      December. The NRC accepted the application. Audits  
23      were performed in the March to kind of current  
24      timeframe.

25                   The Atomic Safety and Licensing Board

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 stood up and formed in June. There were interveners  
2 that filed contentions. The Board admitted two of  
3 those contentions in October.

4 MEMBER BLEY: Can you tell us about those  
5 two and what you have to do to address them?

6 MR. STOUT: I can tell you about the two.

7 MEMBER BLEY: That's fair enough.

8 MR. STOUT: The Southern Alliance for  
9 Clean Energy and TEC have two contentions that were  
10 admitted, one was associated with -- They alleged --  
11 I'm sorry?

12 MEMBER BROWN: Who is TEC?

13 MR. STOUT: I forget the --

14 MEMBER BROWN: Tennessee Environmental  
15 Coalition?

16 MR. STOUT: Something like that.

17 MEMBER BROWN: I can make up -- Give me  
18 some letters and I'll give you --

19 (Laughter)

20 MEMBER BROWN: I just thought I'd give it  
21 a shot and see if we --

22 MALE PARTICIPANT: It may not be the real  
23 name, but --

24 MEMBER BROWN: Ah, whatever, I just  
25 thought --

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MR. AKSTULEWICZ: If I can help, it's  
2 Tennessee Environmental Council.

3 MR. STOUT: Thank you.

4 MEMBER BROWN: Oh, not bad.

5 MALE PARTICIPANT: Two out of three.

6 MEMBER BROWN: Two out of three.

7 MR. STOUT: Thank you.

8 MEMBER BROWN: Thank you.

9 MR. STOUT: So one of them is associated  
10 with the claim that our environmental report had not  
11 assessed the impacts of a spent fuel pool fire and the  
12 other claims that our environmental report includes  
13 too much information, it includes information about  
14 SMR features and that is inappropriate language in an  
15 environmental report.

16 MEMBER BLEY: Okay, thanks.

17 MEMBER BROWN: Thank you.

18 MR. STOUT: So, Ray, why don't you give an  
19 overview of the audits and the stuff that's been going  
20 on here in 2017.

21 MR. SCHIELE: Okay. We supported, TVA  
22 supported three audits. There was a hydrology audit -  
23 -

24 MALE PARTICIPANT: Oh, microphone.

25 MR. SCHIELE: Sorry. TVA supported three

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 audits. The first was the hydrology, the second was  
2 seismic geotech, the third was environmental. The  
3 audits took about a duration of four weeks in 5-week  
4 period.

5 Out of those audits 240 information needs  
6 were responded to within approximately 30 days of the  
7 closure of the audits. Since then ten formal RAIs  
8 have been issued. We have responded to nine, the  
9 tenth was just issued last week.

10 The results of the information needs and  
11 the RAIs will be reflected in a Revision 1 to the  
12 application which will be presented to the NRC in  
13 December.

14 MEMBER BROWN: Who were the information  
15 needs submitted by?

16 MR. SCHIELE: The NRC.

17 MEMBER BROWN: Oh, that's an NRC, okay.

18 MR. SCHIELE: -- to TVA as part of the  
19 audits.

20 MEMBER BROWN: I was just thinking RAIs.  
21 I had never heard the term "information needs" so  
22 that's why I asked.

23 MR. SCHIELE: Yes.

24 MEMBER BROWN: Thank you.

25 MR. STOUT: From our perspective it's been

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 a very efficient review process and the NRC does their  
2 homework up front, gives us the information needs that  
3 they have during an audit, and we get them prepared so  
4 that when they come in the door during the audit there  
5 is a productive engagement during that window period.

6 So materials are prepared in advance to  
7 address the information needs.

8 MR. SCHIELE: And these audits were not  
9 just in a classical classroom environment, they  
10 consisted of meetings in the Knoxville Towers but also  
11 in the field.

12 So all three audits part of the audit was  
13 going to the field, seeing dams, geologic formations,  
14 a lot of the things that supported the information  
15 need discussions, you know, back in a classical  
16 environment, so they were very productive.

17 MR. STOUT: You know, borings is a good  
18 example. You know, they wanted to see certain  
19 features in the core borings. Well, they are all in a  
20 trailer in boxes and they are heavy, so, you know,  
21 weeks in advance we rearrange and lay things out and  
22 so when they are there there are the borings that they  
23 wanted to see. So stuff like that.

24 MEMBER MARCH-LEUBA: So speaking of  
25 audits, I see you don't have anything planned for next

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 year to resolve the open items, but do you expect to  
2 have them or is --

3 MR. STOUT: I can't wait for you to ask  
4 that question in a few minutes. No, we're staffed and  
5 ready and able to respond to any of the needs that the  
6 NRC has.

7 You know, so at the moment there is no  
8 identified known open items that need to be addressed  
9 that we're working on. However, we are ready,  
10 willing, and able to address any needs that they have  
11 during that review period.

12 MEMBER MARCH-LEUBA: Yes. Without knowing  
13 the details I see a really long red line in 2018 with  
14 nothing going on, which obviously --

15 (Simultaneous speaking)

16 MR. STOUT: I'm confident that the NRC  
17 will explain all of the drafting and stuff that is  
18 going to be happening during that period.

19 CHAIRMAN KIRCHNER: So, Dan, while that is  
20 up, so it looks like you expect to have the SER with  
21 open items by the end of this calendar year, is that  
22 pretty much on time? Is that --

23 MR. STOUT: So, you know, we get this  
24 information from the NRC website on their schedule and  
25 --

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 CHAIRMAN KIRCHNER: Yes. Yes, more  
2 correctly I should ask the NRC, but --

3 MR. STOUT: Now so far they have been  
4 executing on schedule.

5 CHAIRMAN KIRCHNER: Okay.

6 MALE PARTICIPANT: Frank's got something.

7 MR. AKSTULEWICZ: So, Chairman, I think  
8 the calendar would show the SE with no open items for  
9 the end of calendar '18, so a year from just about now  
10 we would be --

11 CHAIRMAN KIRCHNER: No, with open items.

12 MR. AKSTULEWICZ: With open items, yes.

13 CHAIRMAN KIRCHNER: So we would probably  
14 receive that from you somewhere around the beginning  
15 of January?

16 MR. AKSTULEWICZ: That's kind of plan is  
17 early, beginning 2018 we would start engaging with the  
18 Committee on setting up timelines for meetings on the  
19 different subject matter.

20 CHAIRMAN KIRCHNER: Okay, right. So this  
21 is not the official NRC calendar, it's my fishing  
22 calendar, but looking at it it looks like, just  
23 eyeballing that, so you're looking at March or so to  
24 interact with the Committee, just so that we can start  
25 planning?

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MR. AKSTULEWICZ: We'll have the detailed  
2 discussions in our presentation --

3 CHAIRMAN KIRCHNER: Okay, all right. We  
4 can take that up in your presentation.

5 MR. AKSTULEWICZ: -- but it's a little  
6 later than that.

7 CHAIRMAN KIRCHNER: Okay, thank you. Keep  
8 going, Dan.

9 MEMBER SKILLMAN: Chairman, are you  
10 suggesting that the calendar that you presented should  
11 be adapted to trout season, opening --

12 (Laughter)

13 MEMBER SKILLMAN: Is that what you are  
14 suggesting?

15 (Off microphone comment)

16 MALE PARTICIPANT: That's good. Next.

17 MR. STOUT: Okay, so, you know, this slide  
18 shows you the extent of the NRC activity trips to the  
19 Tennessee Valley, the various topics and the frequency  
20 of engagement, so it's been an extensive review  
21 process, a lot of it in pre-application space.

22 Next. So, the site, the site is the site  
23 of the former Breeder Reactor project. It is a 1200-  
24 acre parcel. The land is on the Clinch River arm of  
25 the Watts Bar Reservoir.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1           It is within the City of Oak Ridge in  
2           Roane County, Tennessee, and the land butts up against  
3           the Department of Energy, so they are an immediate  
4           neighbor.

5           Towns nearby, Kingston is about seven  
6           miles away, Harriman and Lenoir City are about nine  
7           miles away, Knoxville is about 27 miles away, the city  
8           center of Oak Ridge is about ten miles away, and this  
9           land is owned by the United States of America and  
10          managed by TVA as an agent of the federal government.

11          Next. So this is a bigger view. You can  
12          see things like the Knoxville Airport.

13          MEMBER CORRADINI: Can I -- If I might  
14          just ask a quick question. For the original CRBR  
15          plant what was the size of the output, the thermal  
16          output of that plant since it's the same site, because  
17          there was a site characterization back in the '70s for  
18          that?

19          MR. STOUT: Three hundred?

20          CHAIRMAN KIRCHNER: This is Walt. I  
21          remember 350 megawatts electric.

22          MEMBER CORRADINI: Okay, all right. I  
23          thought it was --

24          CHAIRMAN KIRCHNER: In that ballpark,  
25          about 800 to, 800 plus megawatts thermal.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MEMBER CORRADINI: Okay, thank you.

2 MR. STOUT: Thank you. So on this Slide  
3 10 I'm trying to show, you know, some of the key roads  
4 and the features. The Oak Ridge Reservation is  
5 colored with the purplish hashmarks and the site  
6 itself is that pinkish color.

7 There is a section in there that is brown,  
8 that's an area that we have designated as habitat  
9 protection and it's, you know, on the order of 265  
10 acres.

11 So when we look at what area we would  
12 disturb as part of the construction and the lay down  
13 and the actual physical location of the plant it's  
14 within a 930-acre section of the Clinch River site.

15 Interstate 40 runs about a mile from the  
16 center of the site. You know, you can see on this map  
17 the Knoxville Airport, to get some orientation, you  
18 know, it's about a 20 to 25 minute drive from the  
19 airport to the site, that kind of thing. Next.

20 MEMBER RICCARDELLA: I'm sorry, I didn't  
21 see the brown. You said the area was brown on the --

22 MALE PARTICIPANT: They can see it better  
23 on this one.

24 MEMBER RICCARDELLA: You said the area  
25 with the habitat was brown?

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MR. STOUT: So, yes, you can see it better  
2 on this next slide here, 11. The area that's got the  
3 green hashes is the habitat protection area --

4 MEMBER RICCARDELLA: Okay, okay. All  
5 right, yes, thank you.

6 MR. STOUT: -- up along what's called  
7 Grassy Creek. So if you ever, you know, the site is,  
8 it's a big peninsula and, you know, there is no  
9 development on there.

10 It was disturbed back in the '70s and '80s  
11 from the Breeder Reactor project, so, you know, it's  
12 been engineered and it's level in a lot of the area.

13 I don't have a slide that shows this, but,  
14 you know, when we talked about the former Breeder  
15 Reactor, the work, the hole was partially filled in,  
16 so, you know, they had excavated down to about 80 feet  
17 and then they filled back in about 40, so there is  
18 what we affectionately termed "The Big Hole" on site.

19 We decided to not have the base mat over  
20 top of the old base mat kind of thing. We have moved  
21 slightly to the east on the site to avoid that area,  
22 plenty of room, and, you know, if in the Spring when  
23 we get into the more detailed briefings, you know,  
24 we'll show you that, show you the core boring kind of  
25 information, but, you know, this is the overview and

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 more about the process.

2 MEMBER SKILLMAN: Before you change --

3 MR. STOUT: Yes?

4 MEMBER SKILLMAN: -- let me ask this. Not  
5 far from the proposed site is the Melton Hill Dam, 103  
6 feet high from what would be the water level at the  
7 plant site of the Clinch River.

8 How has that Dam's elevation been factored  
9 into the acceptability of this site?

10 MR. STOUT: In terms of the flood  
11 analysis, you know, there is a dam failure analysis  
12 and it's all included in that. This is a dry site,  
13 you know, so in the flood analysis with wind, wave,  
14 runup, you know it is a dry site.

15 So there is a pretty big elevation change  
16 from the river up to the top of the site.

17 MEMBER SKILLMAN: Can you give us an idea  
18 of how big "pretty big" is?

19 MR. STOUT: I don't have that number  
20 offhand.

21 MEMBER SKILLMAN: Maybe in the next  
22 briefing.

23 MR. STOUT: Yes.

24 MEMBER SKILLMAN: Thank you.

25 MR. STOUT: Yes, thank you. Next slide.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MR. AKSTULEWICZ: It's approximately 20  
2 feet --

3 (Off microphone comment)

4 MR. AKSTULEWICZ: -- of freeboard after  
5 flooding.

6 MEMBER SKILLMAN: Say again, please.

7 MR. AKSTULEWICZ: It's about 20 feet  
8 freeboard after the flood.

9 MEMBER SKILLMAN: Oh. Frank, thank you.

10 MR. AKSTULEWICZ: Yes, sir.

11 MEMBER SKILLMAN: Thank you.

12 MR. STOUT: Okay, thanks. So on this  
13 Slide 12 kind of pointed to a couple of the more, the  
14 features of interest. So on the upper left there is a  
15 potential barge landing site.

16 It is a barge landing that was constructed  
17 many decades ago and could be refurbished and used.  
18 The plant discharge location is, it's right where the  
19 500 KV transmission line intersects the river. I do  
20 have a couple of -- Sure?

21 (Off microphone comment)

22 MR. STOUT: Yes, so that's the plant  
23 discharge. Here, I'll drive. So this is the big  
24 hole, the former excavation of the Breeder Reactor.  
25 There is still there a crane pad from, just by the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 pointer, used for the construction of the breeder.

2 You know, there is some engineered  
3 features, stormwater retention. So like if you are  
4 driving down this road and you kind of look over the  
5 edge here you can see there is a big pond down there.

6 This is the location of the former MET  
7 tower. The MET tower was very old and had some FAA  
8 violations. It has been taken down and there would  
9 need to be a new MET tower erected. but, you know, we  
10 used it to get an adequate amount of date.

11 So this is a 161 KV transmission line that  
12 also intersects the site. This is Interstate 40 down  
13 there at the bottom right corner. These are the  
14 project trailers.

15 We've got two trailers that were used when  
16 we were doing the more significant work, site  
17 characterization, and core borings are stored right  
18 there.

19 Further up river is the planned intake  
20 structure. You can see a ravine and you can probably  
21 follow that ravine and this area of the river is  
22 fairly deep, a good location to have the intake  
23 structure.

24 And, you know, Oak Ridge National Labs  
25 kind of main campus complex is about two miles from

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 this location.

2 MEMBER SKILLMAN: Would you say something,  
3 please, about what appear to be residential dwellings?

4 If the Interstate 40 is within a mile of the proposed  
5 site then it appears as though there are residences  
6 and farms closer than that.

7 MR. STOUT: Sure. Yes, there are, and I  
8 forget the number, but, you know, several hundred that  
9 live within a couple miles of the site. You know, we  
10 have identified the maximally exposed individual, we  
11 have identified the residences that would be the most  
12 impacted if there were, you know, an effluent tank  
13 release.

14 So, you know, and the prevailing winds  
15 taken into consideration. So when we come back in the  
16 Spring we'll talk to those locations, those  
17 residences.

18 MEMBER SKILLMAN: Okay, thank you.

19 MR. STOUT: Next. So we used the  
20 following guidance documents to inform the development  
21 of the early site permit application, Part 52, Subpart  
22 A, Reg Guide 1206, NUREG-0800, RS-002, and other  
23 applicable regulatory guidance, interim staff  
24 guidance, et cetera.

25 So what is a plant parameter envelope? It

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 is a composite of reactor and engineer parameters that  
2 bound the safety and environmental impacts of the  
3 construction and the operation of the plant, and, you  
4 know, as you take these various features, you know,  
5 for example, what will be the depth, you know, so some  
6 of them have very preliminary designs of how deep the  
7 embedment might be and we take all those answers and  
8 then say, well, could they change their mind and go  
9 deeper, and so you can build in some contingency and  
10 you select your it could be as deep as depth.

11 And then you take, you know, highest  
12 height, you know, do they have facilities above grade,  
13 how high above grade, and from a visual impact,  
14 aircraft impact, you know, so you end up with the  
15 tallest component maybe coming from one vendor and the  
16 deepest maybe coming from another and at the end of  
17 the day it's a parameter envelope, it could be as high  
18 as this, could be as low as that.

19 Similarly, on your, you know, heat  
20 discharge into the river, and things like that. So --

21 MEMBER CORRADINI: So can you just -- I  
22 know that -- Excuse me, I just wanted to, I think I  
23 understand your point. Can you give us some idea of  
24 this range that you are speaking about from the "for  
25 example" vendors that you are considering or using as

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 guidance, or as ways to determine a parameter  
2 envelope?

3 MR. STOUT: Well, so I expect we'll come  
4 back in the Spring and have lots of detail on the  
5 plant parameter envelope used, but let me hit thermal  
6 discharge through the river.

7 I described earlier 2420 megawatts  
8 thermal, but there is no design that we are  
9 considering that is anywhere near that. You know, if  
10 we used 12 NuScale modules that totals on the order of  
11 600 megawatts electric, not 800 electric.

12 And so the envelope is the value that we  
13 ultimately select that was informed by these four  
14 designs that often has built in some conservatism.  
15 It's a process that allows the continued development  
16 of the designs and then can accommodate fitting them  
17 into the parameters.

18 You know, there is a whole other licensing  
19 step, the COLA, that will review does this design fit  
20 within the parameters that were selected, and so we  
21 tried to build in margin to accommodate if what if  
22 they do an uprate during the design process.

23 So mPower started off as 125 megawatts and  
24 then it went to a 180 and before they quit it was 195.

25 So, you know, with that kind of uncertainty it is

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 imprudent and from our perspective to build a  
2 parameter envelope that can accommodate multiple  
3 designs, multiple potential changes.

4 MEMBER CORRADINI: Okay, thank you.

5 MR. STOUT: You're welcome.

6 CHAIRMAN KIRCHNER: Dan, looking at the  
7 four different concepts at this point are you finding  
8 any one particular or one that is stretching that  
9 envelope so that, for example, underground given your  
10 site characteristics or thermal discharge or any right  
11 now?

12 I can understand what you'll do and put  
13 some conservatisms in place to bound it, but is there  
14 any one thing about -- Let me put it on the site, not  
15 on the designs, is there any one aspect that is at  
16 this point appears to be a constraint or do you have a  
17 lot of margin and flexibility?

18 MR. STOUT: You almost have to do it in  
19 the details and do it parameter by parameter basis.

20 CHAIRMAN KIRCHNER: Exactly.

21 MR. STOUT: You know, seismic is always  
22 going to be, you know, the devil in the detail, you  
23 know, at what frequency, et cetera, and so, you know,  
24 we'll -- You almost have to wait until you see the SER  
25 and we'll come back and we'll do a more thorough

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 briefing and getting into the technical parameters.

2 You know, but generally there is a feature  
3 of a design that created the boundary, you know, and  
4 so three Westinghouse units was the highest thermal  
5 output.

6 CHAIRMAN KIRCHNER: Right.

7 MR. STOUT: Their design is yea mature,  
8 and so, you know, we did the best we could to  
9 accommodate as many as three Westinghouse units. Now  
10 at the end of the day if they continue developing  
11 their design and if we actually go forward with a  
12 COLA, you know, we have lots of options.

13 We could elect to deploy two, all right,  
14 which takes you way away from the parameter boundaries  
15 in many of the features.

16 CHAIRMAN KIRCHNER: Right.

17 MR. STOUT: So does that help explain --  
18 (Simultaneous speaking)

19 MR. STOUT: -- parameter boundaries?

20 CHAIRMAN KIRCHNER: At this point your PPE  
21 hasn't really been firmed up in great detail. We'll  
22 see that in the, later down the road, or is your  
23 application already bound --

24 (Simultaneous speaking)

25 MR. STOUT: Hey, the plant parameter

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 envelope is nailed down.

2 CHAIRMAN KIRCHNER: It is, okay.

3 MR. STOUT: But what isn't nailed down is  
4 what we would ultimately go build.

5 CHAIRMAN KIRCHNER: Okay, fine.

6 MR. STOUT: Thank you. So there is a  
7 process that was developed by NEI and they have a  
8 template that is used to develop this plant parameter  
9 envelope.

10 That template was approved by the NRC. We  
11 use it as a basis and then when you get into the  
12 details you have to go even beyond the template.

13 So, but, you know, the reactor parameters  
14 like the core power and the owner-engineered  
15 parameters, the selection of grade and how it impacts  
16 flooding and, you know, site information, that can be  
17 like your MET data, and site characteristics, that  
18 would be your X/Q atmospheric dispersion, and, you  
19 know, it all gets built in the envelope. How am I  
20 doing on time?

21 CHAIRMAN KIRCHNER: Fine.

22 MR. STOUT: Okay. So in terms of building  
23 in the conservatism, we do that to accommodate the  
24 future decisions with some flexibility. You know, we  
25 are paying attention to documenting the conservatisms

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1       that help you when you get into that COLA phase.

2               An early site permit works well with the  
3       Part 52 process. We had talked about how we started  
4       off with a construction permit application with  
5       mPower, you know, so we thought about, you know, would  
6       we ever do a construction permit application, well, it  
7       doesn't preclude you from using the early site permit,  
8       but it certainly doesn't fit well together, and so our  
9       current vision is to follow the Part 52 process.

10              Next. So at the conclusions, you know,  
11       TVA is serious about exploring the alternative  
12       generation options and advancing technology  
13       innovation.

14              We believe in nuclear and we believe that  
15       advanced reactors have some hope and promise of  
16       improving safety, of meeting other goals in terms of  
17       cost, in terms of operational, employment flexibility,  
18       it is valid for up to 20 years.

19              So it would reduce the future risk  
20       associated with a COLA because the siting and the  
21       environmental matters would have some finality in  
22       advance.

23              And we are also addressing some policy  
24       issues such as appropriately-sized emergency planning  
25       zones. So that wraps up the presentation. Any other

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 questions?

2 MEMBER SKILLMAN: Yes, sir. Let me ask  
3 you to go back a slide, please. Back up. A  
4 convoluted question, but let me make my point first  
5 and then address, and then present the question.

6 We have dealt with Part 50 applications,  
7 and some of us basically our whole professional lives,  
8 30, 40, 50 years, and we are dealing with Part 52  
9 licenses in the last decade.

10 One of the lessons at least that I  
11 consider most important from our Part 52 experience is  
12 coming to the recognition that you don't know what you  
13 don't know. You don't know what you don't know.

14 So we go ahead and we forge hundreds of  
15 thousands of professional hours at the staff and  
16 licensees and the vendor and we hatch this design we  
17 believe to be capable, fit for duty, precisely what we  
18 want it to be in accordance with the regulation and,  
19 ah ha, we find a subtle detail that has the potential  
20 to cause the whole house of cards to collapse.

21 We found this in a couple of areas and  
22 well intending people, very smart people, have been  
23 able to remedy this, but it's a lesson that I think  
24 that most of us have learned in dealing with Part 52,  
25 whereas as wormlike and slow as Part 50 is we develop

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 an increasingly competent database of understanding of  
2 what the design is ultimately going to be and then  
3 when we go to the construction process we end up  
4 getting precisely what we want, more so, in fact, than  
5 perhaps in a Part 52 license.

6 Here is my question. On an SMR design  
7 that has never been built before, it is truly a  
8 concept, wouldn't we, wouldn't you be wiser to follow  
9 a Part 50 track than a Part 52 track because of the  
10 risks that are associated with what are most certainly  
11 new technologies being presented by the SMRs?

12 I am not suggesting they are less safe. I  
13 am suggesting that the metered approach under Part 50  
14 might in fact be an advantage for where you want to go  
15 with this technology exploration journey that you are  
16 on with what could be several SMRs.

17 So my question is, now might it not be  
18 wiser for you to pursue a Part 50 approach than a Part  
19 52 approach?

20 MR. STOUT: Valid points. Rest assured we  
21 have had many internal debates over this very question  
22 and, you know, we haven't made the decision yet. You  
23 know, we watch what's going on with Vogtle and others  
24 and, you know, are trying hard as an industry to  
25 identify and address lessons learned.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1                   So, you know, ITAAC is a good example. A  
2                   lot of work has been done by the SMR community to try  
3                   to streamline, simplify the ITAAC process or, you  
4                   know, address some of the lessons learned from what  
5                   has been going on.

6                   And, you know, is that going to be better,  
7                   is a new and improved Part 52 process going to be  
8                   better than Part 50? I don't know. I know that on  
9                   the financial side and on the legal side the risks  
10                  associated with the Part 50 process are still out  
11                  there and, you know, maybe that would work out better,  
12                  I don't know.

13                  So we haven't made the decision yet, but  
14                  the points that you make are going to be re-discussed  
15                  again before we make our final go-forward decision.

16                  MEMBER RICCARDELLA: So the early site  
17                  permit would permit either a Part 50 or a Part 52  
18                  application?

19                  MR. STOUT: Yes, a CPA can use the  
20                  information in the early site permit in theory.

21                  MEMBER RICCARDELLA: Okay.

22                  MEMBER SUNSERI: I got a question for you.

23                  MEMBER RICCARDELLA: Thank you, Daniel.

24                  MEMBER SUNSERI: Question over here.

25                  MR. STOUT: Yes?

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1                   MEMBER SUNSERI: Have you established a  
2                   quality assurance program yet for this part of the  
3                   project and if not when do you anticipate establishing  
4                   a quality assurance program?

5                   MR. STOUT: So we have a quality assurance  
6                   program that was used for the early site permit  
7                   application. It was based on TVA's existing quality  
8                   assurance program.

9                   Work done to gather data that is safety-  
10                  related, like the core borings, the vendors were using  
11                  NQA-1, so we haven't made the decision but we are  
12                  thinking right now about in a COLA what will we do  
13                  and, you know, so that's -- I expect it will be  
14                  different and, you know, that QAPD for COLA  
15                  development could very well be NQA-1 right out of the  
16                  gate.

17                  So that's how the data was gathered for  
18                  the early site permit and the future hasn't been  
19                  decided yet.

20                  MEMBER SUNSERI: Thanks.

21                  CHAIRMAN KIRCHNER: Dan, could you address  
22                  I think it's your last bullet, yes. What is your  
23                  approach on "appropriately sized EPZs," emergency  
24                  planning zones?

25                  MR. STOUT: So the application contains a

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 methodology in SSAR Chapter 13.3 that is well defined  
2 and it moves towards a dose-based EPZ size and we have  
3 asked for exemption from the current 10-mile one size  
4 fits all number and a shift to this dose-based  
5 approach and a dose-based approach informed by EPA  
6 Protective Action Guidelines, one rem, you know.

7 So with that construct in mind it's to use  
8 that 13.3 methodology to determine what the  
9 appropriate size is. Now in the early site permit  
10 application is when we are getting that methodology  
11 reviewed.

12 In a COLA we'll take a specific design and  
13 use the specific, you know, X/Q information  
14 atomospheric dispersion and that methodology and  
15 determine what that size is.

16 So in anticipation of the results we  
17 expect that at least one of the designs could  
18 accommodate a site boundary and we expected that all  
19 of the designs that we were considering could work  
20 with a 2-mile.

21 So we took the time to develop the major  
22 features of both, a site boundary and a 2-mile  
23 emergency plan, and included them in Part 5 as Part 5A  
24 and Part 5B.

25 So we are asking the NRC to review those

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 major features with the idea that if we're right when  
2 we get to a COLA if we, using that 13.3 methodology,  
3 analyze and calculate that we can meet the criteria at  
4 the site boundary then we could incorporate by  
5 reference the major features into the COLA. So that's  
6 the approach we have taken.

7 CHAIRMAN KIRCHNER: Without details, if  
8 you drew a 2-mile radius around your, approximately a  
9 2-mile radius around your perspective site, how much,  
10 it looks like you would control most of that --

11 (Simultaneous speaking)

12 MR. STOUT: No --

13 CHAIRMAN KIRCHNER: No?

14 MR. STOUT: You know, there is a --

15 CHAIRMAN KIRCHNER: A good half of it is  
16 out below the river and outside of the reservation, so  
17 to speak?

18 MR. STOUT: Yes. I mean, back to the map,  
19 we had residences, I mean they, you know --

20 CHAIRMAN KIRCHNER: Yes, okay.

21 MR. STOUT: So, yes, what we learned in  
22 the development of these two different emergency plans  
23 and the exemption request is there is a big difference  
24 from site boundary to one foot off the site.

25 CHAIRMAN KIRCHNER: Right.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MR. STOUT: And from 2-mile to 10-mile  
2 there is not that much difference.

3 CHAIRMAN KIRCHNER: Yes.

4 MR. STOUT: You know, so the programs that  
5 you need for emergency planning are, they exist  
6 whether it's two miles or ten miles.

7 CHAIRMAN KIRCHNER: Right. It looks like  
8 two miles notionally includes Interstate 40, for  
9 example.

10 MR. STOUT: Yes.

11 CHAIRMAN KIRCHNER: Okay. All right. Is  
12 that your presentation, Dan?

13 MR. STOUT: Yes, sir.

14 CHAIRMAN KIRCHNER: Okay. Questions from  
15 the --

16 MEMBER BROWN: A thought I remembered from  
17 earlier is that you were going to say something about  
18 the two contentions. You said on a later slide I'm  
19 going to -- Somebody asked about what were the  
20 subjects of the contentions.

21 MR. STOUT: And I -- So --

22 MEMBER BROWN: And I must have missed it.

23 MR. STOUT: No problem.

24 MEMBER BROWN: But I think I was awake,  
25 unusual as that may be.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MR. STOUT: One is the claim that our  
2 environmental report does not contain any information  
3 about spent fuel pool fires.

4 MEMBER BROWN: I got that part.

5 MR. STOUT: The other one is that we  
6 included too much information in the environmental  
7 report --

8 MEMBER BROWN: I didn't read that one as a  
9 contention. I can't believe somebody thought there  
10 was too much information. So, that's fine, I didn't  
11 read that one as a contention, I just thought that was  
12 extra information.

13 (Simultaneous speaking)

14 MEMBER RICCARDELLA: What was the  
15 contention, that it was promotional that you were  
16 promoting it or something, is that what --

17 (Simultaneous speaking)

18 MR. STOUT: That there was information --  
19 So I talked about how part of the purpose and need is  
20 to demonstrate the technology, to demonstrate the --  
21 enhance safety features.

22 So some of that was described, but an  
23 early site permit application is not required to do  
24 energy alternatives analysis, need for power analysis,  
25 et cetera, and those were not addressed in our early

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 site permit application.

2 Those are, you know, deferred till COLA.  
3 And so the intervener's claim that we included  
4 information in the environmental report that was  
5 inappropriate.

6 MEMBER RICCARDELLA: That's why I didn't  
7 view it as a contention, so I thought I missed one.  
8 Thank you.

9 CHAIRMAN KIRCHNER: Okay. So let's  
10 quickly go around the table. Ron?

11 (Off microphone comment)

12 CHAIRMAN KIRCHNER: Well, I wanted to get  
13 any questions of Dan or Ray while they are still here.  
14 Are there any further questions?

15 (No audible response)

16 CHAIRMAN KIRCHNER: Okay. So thank you  
17 very much.

18 MR. STOUT: Thank you.

19 CHAIRMAN KIRCHNER: That was much less  
20 than the allotted time. I am going to take the  
21 Chairman's prerogative and call a break until 20 of ten  
22 and hopefully our Chairman, who is off visiting  
23 another Chairman, I believe, will be back by that  
24 time. So we are recessed until 20 of ten by this  
25 clock.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 (Whereupon, the above-entitled matter went  
2 off the record at 9:25 a.m. and resumed at 9:41 a.m.)

3 CHAIRMAN KIRCHNER: Okay, we are back in  
4 session, and now we will turn to the staff with Joseph  
5 Colaccino making some opening comments. Please  
6 proceed, Joe.

7 MR. COLACCINO: Thank you very much. My  
8 name is Joe Colaccino --

9 (Off microphone comments)

10 MR. COLACCINO: Ah, thank you. So I guess  
11 that tells me I haven't presented for an ACRS in  
12 awhile.

13 MEMBER BALLINGER: Well, it just means you  
14 are too close to me.

15 MR. COLACCINO: So my name is Joe  
16 Colaccino. I am Chief of the Licensing Branch III in  
17 the Division of New Reactor Licensing in the Office of  
18 New Reactors.

19 My Branch has responsibility for the  
20 Clinch River project, both the safety review, which  
21 Allen Fetter, who is the lead project manager, and  
22 Mallecia Sutton, who is his backup on the safety  
23 review, will be presenting to you this morning.

24 I also have responsibility for the  
25 development of the Environmental Impact Statement. I

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 want to acknowledge my other team, Tami Dozier and Pat  
2 Vokoun who are in the audience as well.

3 We are very much busy with the review of  
4 this project going forward. Allen will talk to you  
5 about our schedule, the four-phase schedule that we  
6 are undergoing and future ACRS actions that we have in  
7 his presentation.

8 I also want to let you know that we were  
9 listening to the first part of the presentation. We  
10 do know that you had a number of questions. We will  
11 try to answer as many of those questions as we can.

12 However, we are still conducting the, you  
13 know, we still are underway with our safety review but  
14 we will try our best as we can as we go through. If  
15 you do want us to answer those questions please bring  
16 them up.

17 We are also going to be assisted by Mr.  
18 Jack Cushing from the Environmental Technical Support  
19 Branch, he is in the audience as well. He is involved  
20 in the review of previous early site permit  
21 applications and the review of industry guidance that  
22 was mentioned earlier by TVA in this presentation.  
23 Jack's got extensive experience with that, with early  
24 site permits.

25 My experience, I have been with the NRC

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 for much longer than I would like to mention and I  
2 have been working on new reactor work since 2003,  
3 design certification, COLs, early site permits, and a  
4 number of reactor guidance, maybe, and including Reg  
5 Guide 1206, which a lot of the applications are based  
6 upon.

7 So with that introduction I would like to  
8 turn it over to Allen.

9 MR. FETTER: Okay. Good morning,  
10 everyone.

11 (Off microphone comments)

12 MR. FETTER: There we go. Now can you  
13 hear me?

14 (No audible response)

15 MR. FETTER: Good morning. I am Allen  
16 Fetter and as Joe mentioned I am lead Project Manager  
17 for the Clinch River Nuclear Site Early Site Permit  
18 Application Review, and Mallecia and I are here today  
19 to provide you an overview of the early site  
20 application review process from the NRC's perspective.

21 And I just wanted -- We heard some of the  
22 questions that were asked and I wanted to do, you  
23 know, provide the ACRS with some follow-up. If both  
24 dams would fail the site would, in fact, have 20 feet  
25 of freeboard, so it is, in fact, a dry site, so I just

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 wanted to confirm with that.

2 And then Mallecia did some leg work to get  
3 some population numbers for the one-mile radius.  
4 Mallecia, can you provide that?

5 MS. SUTTON: So based on the application -  
6 -

7 (Off microphone comments)

8 MS. SUTTON: Hi, Mallecia Sutton. So  
9 based on the application information during the CETA  
10 in 2013 within one-mile is about 150 to 200  
11 individuals live within one-mile of the site, okay.

12 MEMBER SKILLMAN: Thank you for that  
13 feedback. Thank you.

14 MR. FETTER: Okay. And then now Joe said  
15 that I was going to describe the schedule, Mallecia  
16 and are splitting this up, and so we'll get into the  
17 four phases, she'll go over that, and we can talk  
18 about details.

19 And one thing that is clear to us is that  
20 we have to look in "Trout Unlimited" to when we  
21 schedule our Subcommittee meeting. So in any case we  
22 want to briefly discuss what an early site permit, you  
23 know, some of this is somewhat repetitive from what  
24 TVA provided, but we have our slides before us that  
25 we'll go through.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1                   We are going to briefly describe what an  
2                   early site permit or ESP is and how it fits into NRC's  
3                   licensing process, describe the regulatory basis for  
4                   an ESP safety review process, and discuss the plant  
5                   parameter envelope, or PPE concept, discuss the ACRS  
6                   review, hearings, and ESP issuance, and present a  
7                   review schedule, and we will also answer your  
8                   questions during this time. Next.

9                   CHAIRMAN KIRCHNER: Might I interrupt you?

10                  MR. FETTER: Absolutely.

11                  CHAIRMAN KIRCHNER: Just quickly, Allen,  
12                  for the record, your cover slide says "Presentation to  
13                  the ACRS Full Committee," we are a Subcommittee and  
14                  just for the record to make that point and it's the  
15                  Full Committee presentation and reports from the Full  
16                  Committee that will reflect the ACRS's contents and  
17                  findings on this matter, okay.

18                  MR. FETTER: Okay, thank you.

19                  MR. COLACCINO: Thank you for that  
20                  clarification.

21                  MR. FETTER: Okay, next slide, please. An  
22                  early site permit is an approval of safety and  
23                  environmental suitability of a proposed site to  
24                  support future construction and operation of a nuclear  
25                  plant.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1           At the early site permit stage the  
2           applicant doesn't have to commit to building a reactor  
3           or specify a reactor design that will be built there.

4           The ESP resolves both site safety and environmental  
5           issues that are independent of a particular reactor  
6           design.

7           As you know, ACRS only reviews the safety  
8           aspects of the early site permit review and ESP does  
9           not allow for construction and operation of a nuclear  
10          plant.

11          Before a nuclear plant can be constructed  
12          and operated as a site with an ESP under Part 52 a  
13          combined license application referencing a specific  
14          reactor technology for the site must be reviewed and  
15          approved by the NRC.

16          Next slide, please. Early site permits  
17          are of interest to applicants for the following  
18          reasons, an applicant chooses an ESP to identify and  
19          resolve safety and environmental siting issues early  
20          and reduce regulatory and financial uncertainty when  
21          planning for the future.

22          An ESP is valid for up to 20 years, which  
23          gives applicants schedule flexibility for seeking  
24          approval to build a plant or have a COLA application  
25          submittal.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1                   Because an ESP does not need to reference  
2                   a specific reactor design an applicant can be in a  
3                   better position to negotiate offers from competing  
4                   reactor technology vendors prior to submitting a  
5                   combined license application.

6                   Next slide, please.   Part 52 contains  
7                   three main licensing processes, early site permit,  
8                   design certification, and combined license. All three  
9                   of these processes start with the option to enter into  
10                  pre-application activities with the NRC.

11                  Pre-application activities are very  
12                  important, especially in areas where new concepts are  
13                  being used or where the applicant is conducting the  
14                  work that will be used for developing the application.

15                  Involving the NRC staff early on helps  
16                  facilitate the review when the application is  
17                  submitted. It also helps the staff identify any new  
18                  regulatory tools that it needs in order to be ready to  
19                  review the application.

20                  The rectangles on the left shows the early  
21                  site permit and design certification application  
22                  review processes. For an ESP siting information is  
23                  required and for the design certification design  
24                  information is required.

25                  The ellipse in the middle captures the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 review of the combined license application, the  
2 hearing takes place and the Commission decision on  
3 issuance of the combined license.

4 The combined license application could  
5 reference either an early site permit, a certified  
6 design, both or neither, as long as it provides  
7 sufficient information to complete the review.

8 Referencing an early site permit and/or a  
9 certified design would be of great value because a  
10 good portion of the review would have been completed  
11 early.

12 The combined license would include  
13 inspections, tests, analysis, and acceptance criteria,  
14 also known as ITAAC, because these ITAAC that we have  
15 determined are necessary to demonstrate that the as-  
16 built plant meets regulations.

17 It would as include any necessary license  
18 conditions, for example, license conditions that could  
19 be used to capture startup testing requirements.

20 The vertical dash line shows major  
21 construction activities that would occur after  
22 issuance of the combined license. The square to the  
23 right of the dash line shows that following  
24 construction and before fuel loading the licensee  
25 would complete the inspection, the ITAAC required to

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

(202) 234-4433

(202) 234-4433

1 demonstrate that the plant as constructed meets the  
2 acceptance criteria.

3 The NRC staff would verify that this, in  
4 fact, has occurred and the Commission would follow the  
5 necessary finding that the acceptance criteria have  
6 been met and would authorize operation. The licensee  
7 would then commence fuel loading and startup  
8 activities.

9 MEMBER SKILLMAN: Alan, if TVA decided to  
10 pursue a Part 50 approach how much of your work of the  
11 effort would be in vain?

12 MR. FETTER: I don't believe any of it  
13 would be in vein.

14 MEMBER SKILLMAN: Yes, that's my thought,  
15 too.

16 MR. FETTER: Yes, yes.

17 MEMBER SKILLMAN: As a matter of fact, the  
18 two could be dovetailed quite smoothly, depending on  
19 how cautious you might be in your oversight in fitting  
20 those pieces together.

21 MR. FETTER: Right. So the licensing  
22 process for Part 50 does allow referencing an early  
23 site permit, and so I believe that if you looked at  
24 the scope of what was contained within Reg Guide 1.70,  
25 which is the COL guidance I believe, that that would

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 be inclusive.

2 Now that's a fairly old document, but the  
3 guidance document going forward, Reg Guide 12.06,  
4 included a lot of that information. So --

5 MEMBER SKILLMAN: Probably not much lost,  
6 if any, is what I am concluding.

7 MR. FETTER: Yes, that would be my  
8 assessment as well, just, you know, answering your  
9 question here.

10 MEMBER SKILLMAN: Okay, thank you.

11 MR. FETTER: Sure.

12 MEMBER POWERS: It's my impression that  
13 one of the advantages of the early site permit is when  
14 it's used fairly quickly because it's a great way to  
15 stand way up your compliance, regulatory staff, and  
16 whatnot, in a staged fashion.

17 I think it worked out well for Vogtle, for  
18 instance, because they could build up their staff for  
19 a new plant in kind of a steady state way as they  
20 began first with the early site permit and then  
21 evolving to the actual reactor.

22 MR. COLACCINO: So if I could just briefly  
23 comment on that. I think that the way that  
24 regulations were initially envisioned back in the late  
25 '80s of how that they would be implemented was just

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 exactly that.

2 MEMBER POWERS: Yes.

3 MR. COLACCINO: But it does not preclude  
4 them to being used differently.

5 MEMBER POWERS: Yes.

6 MR. COLACCINO: And so what TVA was doing  
7 right now or what the other, the first three early  
8 site permit applicants did, you know, the regulations  
9 and the licensing process clearly allowed it.

10 MEMBER POWERS: Yes, it's fine, except I  
11 think you lose something. There may be some advantage  
12 when you put in the bank and store it awhile because,  
13 you know, people, as we discover, age.

14 MEMBER RAY: Well, Dana, as somebody who  
15 has done an ESP before let me tell you the major issue  
16 is investment at risk. It reduces the investment at  
17 risk related to site issues.

18 MEMBER POWERS: I'm sure that is a major  
19 consideration.

20 MEMBER RAY: It certainly was for us.

21 MR. FETTER: All right, any other  
22 questions or comments at this time?

23 MEMBER RICCARDELLA: Some discussion with  
24 the applicant about whether this early site permit  
25 could be used in twinjunction with a Part 50

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 construction permit, is that --

2 MR. COLACCINO: Yes, that was just the --  
3 I believe that was the question before, whether you  
4 could use a Part 50 construction permit referencing an  
5 early site permit, and the regulations do allow for  
6 that.

7 MEMBER RICCARDELLA: Thank you.

8 MR. FETTER: And the other point was that  
9 that would not be in vein, just that it would be  
10 complimentary and potentially dovetail with Part 50.

11 MEMBER RICCARDELLA: The applicant said  
12 theoretically, but that was incorrect. MR.  
13 FETTER: So they are allowed to keep their options  
14 open.

15 MR. COLACCINO: Well, and I'll, you know -  
16 - It hasn't been done before, so let's see. So  
17 theoretically I believe at this stage would probably  
18 be, you know, the process envisions that, so the  
19 actual implementation we would see how that would have  
20 to all work out, because the staff hasn't done that  
21 before.

22 CHAIRMAN KIRCHNER: Allen, with regard to  
23 emergency planning and what we just heard from your  
24 applicant, how are we positioned, how is the staff  
25 positioned to make an assessment of a dose-based EPZ

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 and what is needed in policy space to do that and  
2 where is the NRC on that matter?

3 MR. COLACCINO: So we are still reviewing  
4 the application right now, but I'll go to your  
5 question on policy. So we have a rulemaking that is  
6 in progress right now with, the EPSMR rulemaking,  
7 we'll refer to that in short, they are in the stage  
8 where they are developing the proposed rule.

9 That proposed rule is based on a final  
10 regulatory basis that has already been published. So  
11 we are closely coordinating with and making sure that  
12 we are we aware of the activities that are going on in  
13 that rulemaking effort and we have that regulatory  
14 basis which is publicly available which provides the  
15 basis for proceeding with the rulemaking.

16 So we are very cognizant of what they are  
17 doing as the staff conducts its evaluation.

18 CHAIRMAN KIRCHNER: And what -- Pardon me.  
19 What do you expect the timeframe is to complete that  
20 rulemaking process?

21 MR. COLACCINO: So I believe that Mallecia  
22 sits on the, is one of the working group members, and  
23 I believe that this public schedule for the proposed  
24 rule is --

25 MS. SUTTON: It's 2020.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MR. COLACCINO: So the proposed rule  
2 issuance schedule is I believe at the end of this  
3 year. Do you remember what month, Mallecia?

4 MS. SUTTON: So the draft is getting ready  
5 to be issued early next year, but the final proposed  
6 rule is scheduled to be issued some --

7 (Simultaneous speaking)

8 MR. COLACCINO: So let me give a little  
9 more, so in our rulemaking process we have a -- we're  
10 through the regulatory basis process, now the staff  
11 prepares a proposed rule and that proposed goes to the  
12 Commission and then the Commission will issue that  
13 proposed rule for public comment.

14 So I am trying to remember, you know, the  
15 staff's work I believe is scheduled to be completed --

16 MS. SUTTON: Early March, like March,  
17 April. The proposed rule, draft rule, goes up to the  
18 Commission by early March, April --

19 MR. COLACCINO: Of this year?

20 MS. SUTTON: Of this year, yes.

21 MR. COLACCINO: Okay. Of 2018?

22 MS. SUTTON: 2018 of March, yes.

23 MR. COLACCINO: Of 2018, okay.

24 MS. SUTTON: Yes, sir, yes.

25 MR. COLACCINO: Well, we'll if you are

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 interested we'll get you the precise schedule at ---  
2 ACR staff

3 MEMBER MARCH-LEUBA: On a related question  
4 on emergency planning, if you look three miles to the  
5 west directly the plant is Oak Ridge National  
6 Laboratory. It's a very concentrated -- in a good  
7 summer there you have 5,000 people there when you have  
8 all the students and everybody else.

9 However, it's the optimal operation to  
10 equate because they do drills regularly, there is  
11 announcements, there is accounting for everybody,  
12 everybody has a car they can run to -- the subway and  
13 get stuck there.

14 But does the rule allow for credit for  
15 different types of people to evacuate? It will be  
16 harder to evacuate a hundred people, hundred persons  
17 that you mentioned before within a mile than all the  
18 5000 three miles away.

19 MR. COLACCINO: So I'm not going to -- So  
20 I think what I believe you asked, the question is is  
21 the proposed rule that the staff is working on credits  
22 the specific populations that are mainly within the  
23 area.

24 So I am not going to -- I believe that  
25 that was included in the final regulatory basis, a

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1       characterization of populations like that. I  
2       understand what, the point that you are driving at, so  
3       --

4               MEMBER MARCH-LEUBA: Yes, because you are  
5       going to go here with 5000 people right there,  
6       downwind from the plant --

7               (Simultaneous speaking)

8               MEMBER POWERS: Well, it's --

9               MEMBER MARCH-LEUBA: -- who are not going  
10      to be there by the plume arrives.

11              MEMBER POWERS: It is true that any  
12      facility that is actually built here will be required  
13      to make an evacuation time estimate and the nature of  
14      that population will affect and probably benefit an  
15      early, an estimated evacuation time because they are  
16      organized.

17              MEMBER MARCH-LEUBA: Yes.

18              MEMBER POWERS: Now we have an example of  
19      that in the case of Vogtle where they are located  
20      right next to another Government reservation and they  
21      in fact make use of that Government regulations  
22      emergency capabilities as part of their emergency  
23      plan.

24              So I think the answer is affirmative to  
25      your question that there is credit available to you,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1       you just have to take it.

2               MEMBER MARCH-LEUBA:   Okay.

3               CHAIRMAN KIRCHNER:   May I go back to the  
4       schedule aspect.   So the actual rulemaking process  
5       would come to conclusion in circa 2020, did I hear  
6       that correctly?

7               MS. SUTTON:   Yes.

8               MR. COLACCINO:   I believe that's the  
9       current schedule.

10              (Simultaneous speaking)

11              MR. COLACCINO:   -- public schedule, but  
12       we'll get that.   We'll show the ACRS staff where they  
13       can pull that off and get that information to you.

14              CHAIRMAN KIRCHNER:   Okay.   And I don't  
15       know, Mr. Stetkar pointed out to me that I am not sure  
16       to what extent we would be in the loop on that.   Dana,  
17       would we be part of that rulemaking review?

18              MEMBER STETKAR:   Certainly, yes.

19              (Off microphone comments)

20              (Simultaneous speaking)

21              MEMBER STETKAR:   I mean certainly so that  
22       we should, somebody should be plugged into that  
23       schedule for the draft rulemaking going up to the  
24       Commission.

25              MR. COLACCINO:   I agree, and ACRS will be

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 involved in that.

2 MEMBER STETKAR: Okay.

3 CHAIRMAN KIRCHNER: Now if I am applicant  
4 and I really want to go ahead in an expeditious manner  
5 how would you do your safety review including that of  
6 the EPZ requirements in the ESP if they are doing a  
7 dose-based EPZ and that has not been approved yet?

8 MR. COLACCINO: So -- Do you want --

9 (Simultaneous speaking)

10 MR. COLACCINO: So I believe that in the  
11 Commission's policy in their staff requirements  
12 memorandum I think they in 2015 --

13 MS. SUTTON: Yes, zero, zero, I think it's  
14 0057, gave the staff direction to proceed where the  
15 applicant can come in with an exemption request from  
16 the current rule and the staff will evaluate that  
17 exemption request --

18 CHAIRMAN KIRCHNER: Can you give us that  
19 for the record and provide Quynh with that  
20 information?

21 MR. COLACCINO: We will.

22 MS. SUTTON: We will.

23 CHAIRMAN KIRCHNER: Thank you.

24 MS. SUTTON: Okay, I will do that.

25 MR. NGUYEN: Also follow up on the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 rulemaking activities related --

2 MS. SUTTON: Did I finish answering your  
3 question, sir?

4 CHAIRMAN KIRCHNER: Yes.

5 MS. SUTTON: Okay, good.

6 (Off microphone comments)

7 CHAIRMAN KIRCHNER: Please proceed.

8 MR. FETTER: Okay, next slide, please.  
9 The regulations governing an early site permit  
10 application are listed in this slide. 10 CFR 51  
11 relates to the environmental review. ESP applicants  
12 have the option to use Review Standard 002 or RS-002  
13 in preparing the application.

14 As for staff, NUREG-0800 or the Standard  
15 Review Plan, SRP, this is the primary guidance that is  
16 used during the review.

17 MEMBER POWERS: I would just interject, I  
18 found Review Standard RS-002 to be incredibly helpful  
19 when we did our first early site permits and I  
20 recommended highly to the members to read, it was just  
21 particularly helpful to me at least when I did, when  
22 we reviewed the first of the early site permit, the  
23 first four of the early site permits.

24 So if I am going to pick a document out of  
25 this list to look at I would say RS-002 is the one I

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 would pick.

2 MR. FETTER: Okay.

3 MR. COLACCINO: And I would agree with  
4 that and I will make sure that the staff member who  
5 wrote that lets you know that, gets that compliment.

6 MEMBER POWERS: It was just very, very  
7 helpful and helped to understand not only specifics  
8 but what the general philosophy was.

9 MR. FETTER: Yes, and we have the Atoms  
10 Accession Number for that right here and where we can  
11 provide it to our designated representative  
12 afterwards.

13 MR. NGUYEN: I believe that the Committee  
14 has these documents.

15 MS. SUTTON: Okay, great.

16 MR. FETTER: All right. And then  
17 following up, even though the NUREG-0800 is the  
18 primary guidance that is used during the review staff  
19 ensures that there is no gap in the guidance in RS-002  
20 and the SRP.

21 Next slide, please. The NRC reviews the  
22 ESP applications for safety, security, health, and  
23 environmental factors to ensure that there is  
24 reasonable assurance that a nuclear facility at the  
25 site could be constructed in operation and compliance

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 with the provisions of the Atomic Energy Act and the  
2 Commission's regulations.

3 The NRC reviews an ESP in two major areas,  
4 the safety review, which includes site safety,  
5 emergency planning, and security, and the  
6 environmental review.

7 The NRC issues a safety evaluation report,  
8 or SER, in accordance with the regulations in 10 CFR  
9 Part 52 documenting its evaluation of the application  
10 from a safety perspective.

11 The NRC uses this information to determine  
12 whether or not the site is suitable for constructing  
13 and operating a nuclear power plant. The staff  
14 conducts the safety review to determine if the  
15 application meets the requirements laid out in the NRC  
16 regulations which are part of the Code of Federal  
17 Regulations, and in the Atomic Energy Act.

18 Emergency Preparedness Review is conducted  
19 in accordance with 10 CFR 52.17 to evaluate any  
20 physical characteristics of the proposed site that  
21 could pose a significant impediment to development of  
22 emergency plans and provide a description of the  
23 contacts and arrangements made with federal, state,  
24 and local agencies with emergency planning  
25 responsibilities.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

(202) 234-4433

(202) 234-4433

1           The applicant may propose and the NRC  
2           would review any emergency plans provided in the ESP  
3           application. These emergency plans must be either  
4           partial emergency plans which address some but not all  
5           major features of the emergency plans, such as size  
6           and configuration of emergency planning zones proposed  
7           for the site or complete an integrated emergency,  
8           onsite and offsite emergency plans for the site.

9           For licenses issued under 10 CFR Part 52,  
10          Part 52 points to emergency planning requirements  
11          found in 10 CFR 50.47 and Appendix 10 CFR Part 50. So  
12          the state of emergency plan requirements for Part 50  
13          licensees also apply to Part 52 licensees.

14          By reviewing the ESP security plan the NRC  
15          ensures that the ESP applicant provided sufficient  
16          technical analysis to demonstrate that the site  
17          characteristics and potential hazards do not present  
18          impediments that would preclude the development of  
19          adequate security plans and measures.

20          Additionally, the staff conducts  
21          environmental reviews under the National Environmental  
22          Policy Act, or NEPA, to evaluate the impacts of  
23          construction and operation at the site.

24          The staff's findings in these reviews are  
25          documented in the SER and the staff's environmental

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 findings are documented in the Environmental Impact  
2 Statement, or EIS.

3 Next slide, please. This flow chart  
4 outlines the steps in the ESP review. The rectangular  
5 shaped boxes indicate an NRC action, the starbursts  
6 are areas where members of the public can get  
7 involved.

8 As shown there are several opportunities  
9 for the public to share comments and ask questions  
10 about the NRC review of the application. During the  
11 safety review members of the public can attend  
12 meetings where the advisory committee on reactor  
13 safeguards examines the staff's assessment.

14 The Atomic Safety and Licensing Board,  
15 ASLB, or also Licensing Board, examines the request to  
16 participate in a contested hearing. There is also a  
17 mandatory hearing that is held after the staff  
18 publishes reports on its final safety and  
19 environmental reviews.

20 Ovals indicate throughout the process when  
21 our findings are documented in the SER and the EIS  
22 statements.

23 CHAIRMAN KIRCHNER: Allen, while you have  
24 that up --

25 MR. FETTER: Yes?

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 CHAIRMAN KIRCHNER: Which of those boxes  
2 now can you check? Do you have a draft EIS at this  
3 point?

4 MR. FETTER: No. The draft EIS is  
5 scheduled for publication in June of this year, if --

6 MS. SUTTON: March 2018.

7 MR. FETTER: 2018, sorry.

8 MR. COLACCINO: We keep thinking it's next  
9 year.

10 MR. FETTER: Yes, we're getting ahead of  
11 ourselves here, so -- but we do have our environmental  
12 review staff in the audience who can correct any  
13 misstatements.

14 CHAIRMAN KIRCHNER: So you have your  
15 environmental review and report at this point?

16 MR. FETTER: Yes, we do. So the draft EIS  
17 is in preparation and that will be published in June  
18 of 2018.

19 CHAIRMAN KIRCHNER: Okay, thank you.

20 MR. FETTER: And the hexagon shaped boxes  
21 indicate the submittal of the application and the  
22 Commission's decision. And I will now turn over the  
23 remainder of the presentation to Mallecia Sutton, then  
24 I will be available to answer questions.

25 MS. SUTTON: Hi, again, I am Mallecia.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 The safety review is a comprehensive and in-depth  
2 review of the applicant's analysis and evaluation as  
3 presented in its early site permit application and it  
4 begins after the application is docketed.

5 During a safety review the staff evaluates  
6 several technical areas. A partial list of the areas  
7 covered during the safety review is what you see on  
8 this slide.

9 Included in this list is applicant's  
10 emergency preparedness program while Federal Emergency  
11 Management Agency, also know as FEMA, evaluates the  
12 adequacy of the offsite emergency preparedness program  
13 which is implemented by the state and local  
14 governments.

15 The NRC evaluates the adequacy of the  
16 applicant's onsite emergency preparedness and the NRC  
17 reviews FEMA's findings in making the overall  
18 determination of the accuracy of the emergency  
19 preparedness plans.

20 All of our reviews follow a systematic  
21 approach. For the safety review the staff documents  
22 its conclusion about whether or not there is  
23 reasonable assurance that a site is acceptable for a  
24 nuclear power plant based on the regulations in 10 CFR  
25 Part 52.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

(202) 234-4433

(202) 234-4433

1           And quality assurance programs, as  
2 mentioned earlier in conducting a safety review the  
3 staff uses guidance provided in NUREG-0800, the  
4 Standard Review Plan, or SRP.

5           It is possible to approve an ESP site  
6 without selected reactor technology. ESP plant  
7 parameters, also known as PPE, values can be bound in  
8 a variety of reactor technologies rather than one  
9 specific technology.

10           The PPE values are bounding criteria used  
11 by the staff to determine the suitability of an ESP  
12 site for construction and operation of a nuclear  
13 plant.

14           The SER evaluates the site  
15 characteristics. At the COL stage when a specific  
16 technology is identified the ESP PPE values are  
17 compared to those of the selected technology.

18           If design parameters of the selected  
19 technology exceed bounding ESP PPE values additional  
20 reviews are conducted to ensure that the site remains  
21 suitable from a safety and environmental standpoint  
22 for construction and operation of the selected nuclear  
23 plant technology.

24           In addition, the site parameters for the  
25 referenced certified design must be bounded by the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 site characteristics in the ESP.

2 Slide 11. In the development of the PPE  
3 an applicant --

4 CHAIRMAN KIRCHNER: May I interrupt you --  
5 (Simultaneous speaking)

6 MS. SUTTON: You sure can.

7 CHAIRMAN KIRCHNER: Sorry for the  
8 interruption. Going back to the previous viewgraph,  
9 the last bullet, you state that additional reviews are  
10 conducted if the selected technology exceeds the  
11 bounding plant parameter estimates, or envelope.

12 Does the public also then have an  
13 opportunity to intervene, and thinking specifically of  
14 what we have seen throughout the industry the desire  
15 to uprate the plants that have, that according to the  
16 applicant they have bounded their estimates  
17 conservatively, we don't know that, but we will assume  
18 that, but if indeed they hadn't and they come back to  
19 you with say another hundred megawatts thermal or X  
20 megawatts electric, what additional reviews would you  
21 do and are they then subject to public intervention?

22 MS. SUTTON: So, yes. The answer to your  
23 question is yes. So if there is a change that is  
24 different from the parameter that has been issued for  
25 the ESP and the CR application comes in then the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 interveners do have the opportunity to -- probably  
2 have opportunity to request to be, petition and ask  
3 for that change in the application, because if it's  
4 not bounded anymore, even at the staff end, you have  
5 to evaluate that new information to confirm if it fits  
6 within that box of the PPE.

7 MR. COLACCINO: So and I would -- That's a  
8 great answer, thanks. And just to understand, in a  
9 COL we are in a new, we're in a different action,  
10 that's a different federal action.

11 It is an additional review of the  
12 application. Your use of the word intervenor, there  
13 is another public process and there is a --

14 (Simultaneous speaking)

15 MR. COLACCINO: -- associated with that.  
16 So it's just clear, you know, we're out of ESP, the  
17 permit is issued, the combined license application  
18 comes in. That application is evaluated on its  
19 merits.

20 CHAIRMAN KIRCHNER: Thank you.

21 MR. FETTER: So just to follow up, so even  
22 if they are within the PPE they can still proffer  
23 contentions.

24 MR. COLACCINO: Good clarification. Thank  
25 you.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MS. SUTTON: You're welcome. I'm on Slide  
2 11. In the development of the PPE an applicant  
3 typically draws data from a number of plant  
4 technologies under consideration to construct a  
5 bounded envelope.

6 It is important to note that when issuing  
7 the permit NRC approves the PPE rather than a specific  
8 technologies that the PPE was drawn from. As such,  
9 any plant technology that can be demonstrated to be  
10 bounded by the PPE is suitable for use in a combined  
11 license application.

12 In TVA's case they use the following  
13 reactor design to develop the PPE, as I mentioned they  
14 used the BWXT, the used NuScale, the Holtec, and the  
15 Westinghouse SMR.

16 TVA's PPE is based on construction and  
17 operation of two or more SMRSs at the Clinch River  
18 Site with a nuclear generating capacity of 2400  
19 megawatts thermal or 800 megawatts electric.

20 CHAIRMAN KIRCHNER: So since this is a  
21 bounding estimate how do you deal with multi-unit  
22 plants and the source term that you used for  
23 establishing that dose base to EPZ?

24 MS. SUTTON: So the staff is still  
25 currently evaluating that particular question that you

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 just asked, so we don't have findings on that  
2 particular answer, but when we do get to that ending  
3 point of the review we'll be happy to come back and  
4 share that information with you.

5 CHAIRMAN KIRCHNER: It seems to me that  
6 would be critical going forward if you allow for a  
7 common cause failure, i.e. seismic events, then each  
8 of the units if it exceeded its seismic design basis  
9 would be expected have a design basis accident and  
10 release.

11 MS. SUTTON: So there's two or more, but  
12 there is a limit because they also said no more than  
13 2400 megawatts thermal, so whatever technology that is  
14 chosen it can't exceed the 2400 megawatts or the 800  
15 megawatts electric so whatever box that the staff  
16 determines that the PPE should be would not exceed  
17 those limits.

18 CHAIRMAN KIRCHNER: So you will use  
19 notionally the 2200 megawatts thermal and an LWR  
20 technology to determine your source term?

21 MS. SUTTON: Within -- Remember, this is --  
22 - The ESP is technology neutral, so we --

23 CHAIRMAN KIRCHNER: Right.

24 MS. SUTTON: Yes, so we're not, like I  
25 said based on the parameters that is provided in the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 application is what the staff is currently using to  
2 evaluate what the box might be and we have not  
3 concluded the box, so if that --

4 CHAIRMAN KIRCHNER: Well --

5 MS. SUTTON: Yes.

6 CHAIRMAN KIRCHNER: -- you --

7 MEMBER CORRADINI: Can I ask -- Walt, can  
8 I ask your question a little --

9 CHAIRMAN KIRCHNER: Yes, please, Mike.

10 MEMBER CORRADINI: So are you looking at  
11 design basis events based on the thermal power you  
12 just noted or are you looking at it -- I'm still not  
13 clear of your answer to Walt.

14 I assume that with any design basis  
15 accident there would be a thermal power associated  
16 with it and then an associated source term. Is that  
17 how you are doing the EPZ comparison analysis?

18 MR. COLACCINO: So this is Joe Colaccino,  
19 I understand the question. I don't think we have the  
20 staff here prepared to answer that question right now,  
21 but what the early site permit process is a technology  
22 neutral process.

23 Now the staff is asking questions about,  
24 has asked RAIs associated with, you know, one of  
25 those, you know, getting a little bit deeper, because

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 of what is being requested in the application.

2 So understand the interest in that type  
3 of, in that discussion, and that is something that  
4 we'll be prepared to come and talk about in much more  
5 detail when we are in the, we're back with ACRS once  
6 the staff has completed its work on the evaluation of  
7 their application.

8 MEMBER CORRADINI: Okay, but -- All right,  
9 but let me use an example, since Vogtle was an ESP  
10 site was it not a single unit that was used even  
11 though there are two units being built?

12 I think we'll use that as an example to  
13 answer Walt's question.

14 MR. COLACCINO: Yes, that is correct,  
15 Vogtle was used, single -- Even though it was an  
16 application for two units the analyses that were done  
17 were for a single unit.

18 MEMBER CORRADINI: Thank you.

19 MR. COLACCINO: Thank you.

20 MR. FETTER: So we will take this question  
21 and make sure we're ready to answer it when the time  
22 comes.

23 CHAIRMAN KIRCHNER: Not to repeat myself,  
24 but it seems to me if you really want to play the  
25 technology neutral game then you are bound by the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 applicant, you are bound to analyze the applicant's  
2 upper threshold for a thermal power and, therefore,  
3 come up with a source term and then that probably  
4 drives you to say, well, it's an LWR technology and  
5 assume some analytical approach on that order I think  
6 would be needed to say it's technology neutral,  
7 correct?

8 MS. SUTTON: So we actually have an audit  
9 -- I mean the questions you are asking are questions  
10 that the staff are evaluating --

11 MALE PARTICIPANT: Right.

12 MS. SUTTON: -- and we actually have an  
13 audit today after this ACRS to go over and analyze  
14 those specific, some of those questions that you  
15 asked.

16 So that's why you see I am kind of  
17 hesitant to give you any further information because  
18 we're still on a review. As soon as we get clarity on  
19 where the staff is headed with the review, because the  
20 application came in in January, we're just in Phase B.

21 We would be more than happy to present the  
22 staff's findings at that time and provide you  
23 hopefully with more clarity on where the staff stands  
24 and our position.

25 CHAIRMAN KIRCHNER: It seems to me you have

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 a policy issue in effect in front of you, whether it's  
2 four of one or eight of another what you are going to  
3 assume about the source term for that envelope,  
4 because if you're going to say it's technology neutral  
5 then you are almost driven to use the thermal power  
6 rating and some assumption on technology for deriving  
7 a source term because you don't know how many units they  
8 are going to have so you can't assume a priori, yes,  
9 we know they are modular, or it could, but, again,  
10 then that's not technology neutral.

11 MEMBER POWERS: A lot of your concerns are  
12 probably -- You have to recognize that there is a  
13 criterion and that a lot of these things are threshold  
14 sorts of things.

15 So you have a 25 rem at the site boundary  
16 criterion, it's not continuous. Once you cross that  
17 25 rem at the site boundary you are no longer in  
18 compliance, so it's not a continuous function.

19 And why these small plants can violate  
20 that even though they have very much lower power than  
21 2000 megawatts, or 2400, or something like that, it  
22 only takes about 25,000 curies of iodine to violate  
23 that site boundary for an existing plant.

24 So you can escape a lot of the details of  
25 what the plant is just because it produces iodine.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1                   MEMBER RAY:   Walt, can I also make a  
2                   comment, actually make two comments?   One, we have  
3                   added units at sites often in the past and what  
4                   assumption one makes about the hypothesis that you  
5                   gave relative to an earthquake, for example, you  
6                   exceed the design basis earthquakes to all the units  
7                   at the site are they required to be assumed to fail.

8                   That's one thing we need to be conscience  
9                   of where we are in the policy space and I think that  
10                  is an issue that has been long under discussion and we  
11                  should keep that in mind but not assume the solution  
12                  is obvious.

13                  MR. COLACCINO:   So the staff would like to  
14                  proceed.   We understand what the question is and --

15                  (Off microphone comment)

16                  MR. COLACCINO:   Oh.   And I was going to  
17                  say unless there is more questions.

18                  MS. SUTTON:   We have two things.

19                  CHAIRMAN KIRCHNER:   Harold, do you have  
20                  more to add?

21                  MEMBER RAY:   No.   No, I just wanted to say  
22                  we need to be mindful of the fact that we have added  
23                  units as sites, Vogtle is an example, but only just an  
24                  example out of many, and what one assumes about all  
25                  the units that may affected by a common occurrence is

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 something that is a significant policy issue that we  
2 need to recognize and deliberate in that way, not  
3 assume, for example, that the ESP would envelope  
4 everything that would ever be done at the site.

5 MR. STOUT: If I might, I would encourage  
6 you to look at SSAR Section 13.3. It contains the  
7 methodology that addresses design basis and beyond  
8 design basis.

9 CHAIRMAN KIRCHNER: Okay, please proceed.

10 MR. COLACCINO: Okay.

11 MS. SUTTON: Okay, thank you. ACRS  
12 reviews each ESP application and the Safety Evaluation  
13 Report. ACRS reports to the Commission on the safety  
14 portions of the ESP application. I am on Slide 13.

15 CHAIRMAN KIRCHNER: Just going forward we  
16 should use what is actually required and what is  
17 required in the language is "which concerns safety,"  
18 okay.

19 MS. SUTTON: Okay.

20 CHAIRMAN KIRCHNER: Just for clarity.

21 MS. SUTTON: Okay. Okay, thank you.  
22 There are two types of hearings. There is the  
23 uncontested hearing, also known as the mandatory  
24 hearing, which is going to be done by Atomic Safety  
25 Licensing Board, and there is the contested, and that

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 is when contentions are admitted.

2 As you were told two contentions was  
3 admitted on this proceeding on October 10, 2017,  
4 related to environmental issues.

5 I am on Slide 14. Before the Commission  
6 can issue an ESP with terms and conditions as it deems  
7 appropriate for 10 CFR 52.24 the following needs to  
8 occur, hearings on initial decisions must be made by a  
9 licensing board, ACRS reports provide to the  
10 Commission, and the Commission needs to conclude that  
11 Atomic Energy Act and regulations have been met. The  
12 ESP terms are valid for ten to 20 years.

13 I am on slide 15. The NRC has issued the  
14 following five ESPs, Clinton, Grand Gulf, North Anna,  
15 Vogtle, and PSEG. Both Anna and Vogtle reference an  
16 ESP in their combined license.

17 The NRC is currently reviewing the Clinch  
18 River Nuclear Site ESP application. This slide shows  
19 the Clinch River Nuclear Site ESP application accepted  
20 dates and a four-phase safety review schedule.

21 We are currently in Phase B of the review,  
22 Development of Advanced SE Sections with No Open  
23 Items, and some sections are expected to be ready for  
24 ACRS Subcommittee review by late May 2018.

25 Phase C, ACRS Review and Meetings on

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 Advanced SEs is scheduled to run from June 2018  
2 through March 26, 2019.

3 And this concludes the staff presentation.

4 Do we have any additional questions?

5 MR. COLACCINO: I would just like to add  
6 something a little bit, Mallecia, if we could go back  
7 to the previous slide.

8 MS. SUTTON: Okay.

9 MR. COLACCINO: Just to make sure that  
10 there was no confusion.

11 MS. SUTTON: Okay.

12 MR. COLACCINO: So this is a four phase  
13 schedule and I noted on TVA's slide that it looked  
14 like that there was a milestone in there for a safety  
15 evaluation report with open items and I think I recall  
16 some discussion about when that would be delivered to  
17 ACRS.

18 So we have no intent to deliver a safety  
19 evaluation report with open items to the ACRS. What  
20 you will be getting is a no open item safety  
21 evaluation report.

22 So it will be all of -- You will not  
23 receive a safety evaluation report until all those  
24 items are resolved in the staff's mind and then  
25 brought to the ACRS.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 And so what we are looking for is we have  
2 already interfaced with ACRS staff about the timing of  
3 when those would be coming up and the timing of those  
4 reviews.

5 We are hoping that some of those will be  
6 done a little bit earlier than when the public  
7 milestone gives that span starting in June of 2018,  
8 but we'll interfacing with you all for scheduling for  
9 that for those reviews. Thank you.

10 MEMBER POWERS: I will say that I thought  
11 we were relatively successful on the previous early  
12 site permits, not when it was resolved but when it was  
13 clear, the path to the resolution of any open item.

14 It didn't -- I mean in old cases that I  
15 can remember we were able to proceed pretty easily  
16 because all parts agreed, yes, this is the thing that  
17 needs to be resolved and here is how we're going to do  
18 it, and we just needed to fill in some things pretty  
19 well.

20 CHAIRMAN KIRCHNER: Okay. Thank you very  
21 much. While you are there let us go around amongst  
22 the members for any questions or comments. I'll start  
23 with you Ron.

24 MEMBER BALLINGER: No comments.

25 CHAIRMAN KIRCHNER: Pete?

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 MEMBER RICCARDELLA: No comments, thank  
2 you.

3 CHAIRMAN KIRCHNER: Okay.

4 MEMBER SKILLMAN: Thank you, no further  
5 comment.

6 MEMBER POWERS: Yes, again, I'd just say  
7 that review of RSS-002 is good preparation for going  
8 into this thing. It -- What I can say unquestionably  
9 is it helped me a lot when we did the first one.

10 CHAIRMAN KIRCHNER: Matt?

11 MEMBER SUNSERI: I have nothing additional  
12 to add. Thank you.

13 CHAIRMAN KIRCHNER: So our Chairman just  
14 returned, so I'll just repeat what I thought I heard  
15 on schedule matters, and that is we would be looking  
16 in the May 2018 timeframe to start looking at sections  
17 of the SER with no open items.

18 MR. COLACCINO: Correct.

19 MS. SUTTON: Correct.

20 CHAIRMAN KIRCHNER: That's the staff's  
21 plan at this point.

22 MEMBER BLEY: We're not going to see the  
23 one with open items? That's --

24 (Simultaneous speaking)

25 MS. SUTTON: That was not part of our

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 schedule, so --

2 MR. FETTER: Yes, this is a four phase  
3 schedule.

4 MS. SUTTON: Yes.

5 MEMBER BLEY: There we go. We'll see how  
6 it works.

7 CHAIRMAN KIRCHNER: Okay. John?

8 MEMBER STETKAR: No further comments.

9 MEMBER MARCH-LEUBA: Nothing to add.

10 CHAIRMAN KIRCHNER: Charlie?

11 MEMBER BROWN: Nothing more. Thank you.

12 CHAIRMAN KIRCHNER: All right.

13 (Off microphone comments)

14 CHAIRMAN KIRCHNER: Mike and Harold, have  
15 you any comments or questions?

16 MEMBER RAY: Well, I'll go first. I just  
17 want to say that the ESP process I have been a big,  
18 big fan of it for many years and as I mentioned in my  
19 comment following Dana it has the tremendous benefit  
20 of resolving some, not all, but some major issues  
21 before major investment takes place by the ultimate  
22 COLA or operating license holder.

23 So it's a very, very I think important  
24 process and I am glad we have a chance for the current  
25 generation on the Committee to go through it and get

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 familiar with it because it was the only way I could  
2 see in my prior life if we could ever move forward and  
3 get a project built again.

4 So I just think we should look at it as  
5 having that kind of a potential role in the future.  
6 The use with a certified design that isn't yet  
7 selected and so on is inevitably I think what we have  
8 to recognize, in other words the envelope principle,  
9 because it's only then after the ESP is obtained that  
10 the potential licensee can say, all right, I am ready  
11 to put some money behind this and I'll pick up the  
12 reactor design and invest and add as I would need to  
13 do in order to move forward.

14 So it's an important process and I just  
15 want to make that point.

16 CHAIRMAN KIRCHNER: Thank you, Harold.  
17 Mike?

18 MEMBER CORRADINI: I don't have any other  
19 comments. I just wanted to thank TVA and the staff.  
20 We're going to see them again, so I think a lot of the  
21 detailed comments we'll have to see when we see the  
22 details of the results.

23 CHAIRMAN KIRCHNER: Good. Thank you,  
24 Mike. Let me turn to the audience and members of the  
25 public who are present. If anyone would like to make

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 a statement or a comment please come and identify  
2 yourself at the microphone here at the corner of the  
3 table.

4 Seeing no one coming forward, can we check  
5 the --

6 MALE PARTICIPANT: I'll just check with  
7 the --

8 MR. BROWN: The bridge is open.

9 CHAIRMAN KIRCHNER: Okay, the bridge is  
10 open. Okay, thank you. Is there any member of the  
11 public who would like to make a comment?

12 MR. SAFER: Yes. Hello, can you hear me?

13 CHAIRMAN KIRCHNER: Yes. Please identify  
14 yourself.

15 MR. SAFER: Okay, thank you. My name is  
16 Don Safer. I am on the Board of the Tennessee  
17 Environmental Council in Nashville and we are a 48-  
18 year-old environmental advocacy organization in  
19 Tennessee, operate statewide, so for your information.

20 And then on the contention, the second  
21 contention that was talked about during the TVA  
22 portion of the meeting, it was unfairly and  
23 inadequately characterized.

24 Let me give you some more information on  
25 that please. From the document that we filed, the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1       Petition to Intervene, Contention 3 is what it was,  
2       asserts that the environmental report is biased and  
3       unfair because it advocates the technical advantages  
4       of SMRs as an energy alternative even though TVA  
5       formally elected not to address energy alternatives or  
6       the need for power in the environmental report for the  
7       ESP.

8               And a little bit more, and I am not going  
9       to go too deeply, but allow me just to go into the  
10      statement of the contention, the ESP application  
11      violates the National Environmental Policy Act and the  
12      NRC implementing regulations because it contains  
13      impermissible language comparing the proposed SMR to  
14      other energy alternatives and discussing the economic  
15      and technical advantages of the facility.

16             The language is impermissible because TVA  
17      has explicitly invoked 10 CFR 51.50(b)(2) which  
18      excuses it from discussing the economic, technical,  
19      and other benefits of the proposed facility, such as  
20      need for power.

21             By formally choosing to exclude  
22      consideration of alternatives from its environmental  
23      report TVA has effectively precluded petitioners from  
24      submitting contentions on those subjects.

25             So that's just to give you the actual

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 contention itself and give you a little bit more  
2 information.

3 CHAIRMAN KIRCHNER: Thank you. Is there  
4 anyone else, a member of the public who wishes to make  
5 a statement?

6 (No audible response)

7 CHAIRMAN KIRCHNER: Hearing none we can  
8 close the bridge line. Thank you. Any final comments  
9 or questions?

10 MR. COLACCINO: Chairman --

11 CHAIRMAN KIRCHNER: Yes?

12 MR. COLACCINO: -- just summarizing our  
13 action items for the staff, I picked up two, that we  
14 will follow up with the ACRS staff on more explicit  
15 information on the EPSMR rulemaking schedules, in  
16 particular, and we also just noted the discussion  
17 about single unit versus multi units and we'll make  
18 sure that the staff is aware of that coming into  
19 either the more, as we present our safety evaluation  
20 report.

21 CHAIRMAN KIRCHNER: Thank you.

22 MEMBER BROWN: Walt, could I --

23 CHAIRMAN KIRCHNER: Yes, Charles?

24 MEMBER BROWN: I've forgotten how this  
25 process interacts with the ALSB. There are obviously

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 contentions, and he just clarified what they thought  
2 on theirs, how does your end product SER interface  
3 with the actions of the ALSB?

4 MR. COLACCINO: So --

5 MEMBER BROWN: Do you have to come  
6 afterwards or do you wait for them or --

7 MR. COLACCINO: I appreciate the question.  
8 We are working on two separate processes right now,  
9 so the staff's review proceeds as it does. The  
10 process that is going through contention is being run  
11 and that is completely separate and we'll --

12 (Simultaneous speaking)

13 MEMBER BROWN: Okay, two separate -- two  
14 separate, solid things.

15 MR. COLACCINO: Yes.

16 MEMBER BROWN: Okay. Thank you.

17 CHAIRMAN KIRCHNER: Okay. Well, thank you  
18 very much. Thank you to the TVA presenters and staff  
19 and with that we are adjourned.

20 (Whereupon, the above-entitled matter went  
21 off the record at 10:39 a.m.)

22

23

24

25



# TVA Clinch River SMR Project Early Site Permit

November 15, 2017

---

Advisory Committee on Reactor Safeguards  
Subcommittee Meeting



# **Early Site Permit – Overview**

**Dan Stout**

**Senior Manager, Small Modular Reactors**

# Early Site Permit Application (ESPA)

An Early Site Permit assesses site suitability for potential construction and operation of a nuclear power plant.

The TVA ESPA contains more than 8,000 pages and is supported by over 80,000 pages in referenced documents.

## **Application includes:**

- Site Safety Analysis Report to address impacts of the environment on the plant
- Environmental Report
- Emergency Plans (Part 5A and Part 5B)
- Exemptions (Part 6)

## **ESPA based on a “plant parameter envelope” (PPE)**

- Based on input from the four U.S. light-water SMR designs developed by BWX Technologies, Holtec, NuScale Power, Westinghouse
- Assumes two or more SMR units of a single design
- Up to 800MWt for a single unit with a combined nuclear generating capacity not exceeding 2420 MWt (800 MWe)

# Application Organization

## **Part 1 – Administrative Information**

## **Part 2 – Site Safety Analysis Report**

- Chapter 1 – Introduction and General Description
- Chapter 2 – Site Characteristics
- Chapter 3 – Aircraft Hazards
- Chapter 11 – Radioactive Waste Management
- Chapter 13 – Emergency Planning
- Chapter 15 – Transient and Accident Analysis
- Chapter 17 – Quality Assurance

## **Part 3 – Environmental Report**

## **Part 4 – Limited Work Authorization – Not Used**

## **Part 5 – Emergency Plan**

## **Part 6 – Exemptions and Departures**

## **Part 7 – Withheld Information**

## **Part 8 – Enclosures**

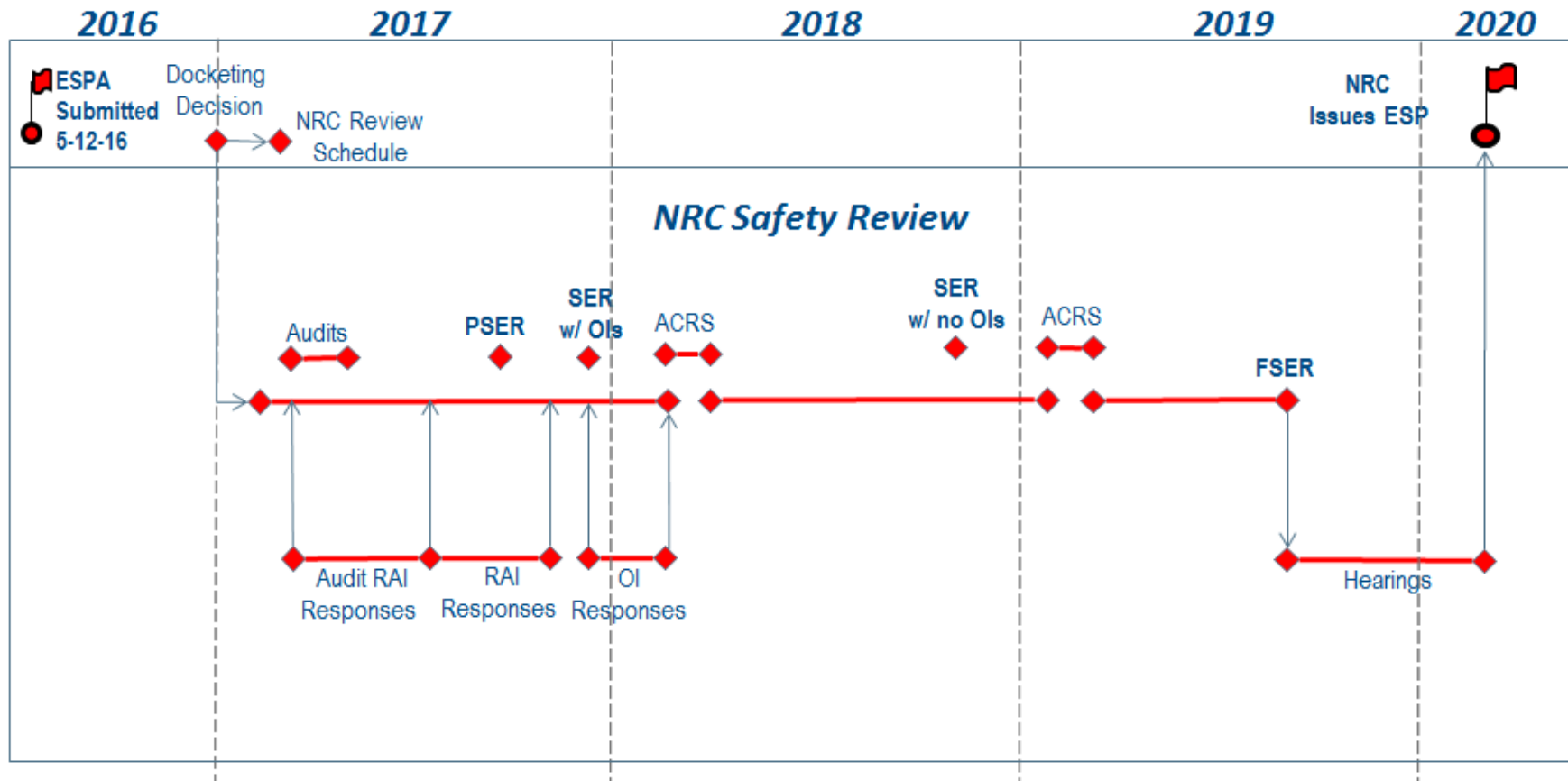
# ESPA Contractor Support by Part

ESPA Part	Originator
1- Administrative Information	TVA
2- Site Safety Analysis Report (SSAR)	Bechtel (with exceptions below)
Demography	Enercon
Meteorology	TVA & Enercon
Flooding	BWSC
Seismic	Bechtel, URS, & Rizzo
Ch13 - Conduct of Operations	TVA
Ch17 - Quality Assurance	TVA
3- Environmental Report (ER)	AECOM
5- Emergency Plan	Enercon
6- Exemptions	TVA & Enercon
7- Withheld	TVA
8- Enclosures	Bechtel

# Early Site Permit Application – Chronological Development

- TVA begins exploring potential SMR Project 2009
- Site Characterization 2010 - 2015
- ESPA Submitted to NRC May 2016
- NRC accepts ESPA for review December 2016
- NRC performs audits & issues RAls March – October 2017
- Contentions filed, ASLB formed June 2017
- Two Contentions Admitted by ASLB October 2017

# ESPA Project Update – Licensing Process



# Application Submittal

## NRC Site Visits

- |                                     |                |
|-------------------------------------|----------------|
| ■ Pre-Environmental Report Visit    | March 2013     |
| ■ PPE Development                   | September 2014 |
| ■ Pre-application Site Visit        | October 2014   |
| ■ Alternative Sites Visit           | June 2015      |
| ■ ESPA Readiness Review             | August 2015    |
| ■ Meteorology and Source Term Audit | April 2017     |
| ■ Hydrology and Groundwater Audit   | April 2017     |
| ■ Seismic/Geotechnical Audit        | May 2017       |
| ■ Environmental Audit               | May 2017       |

# Site Location

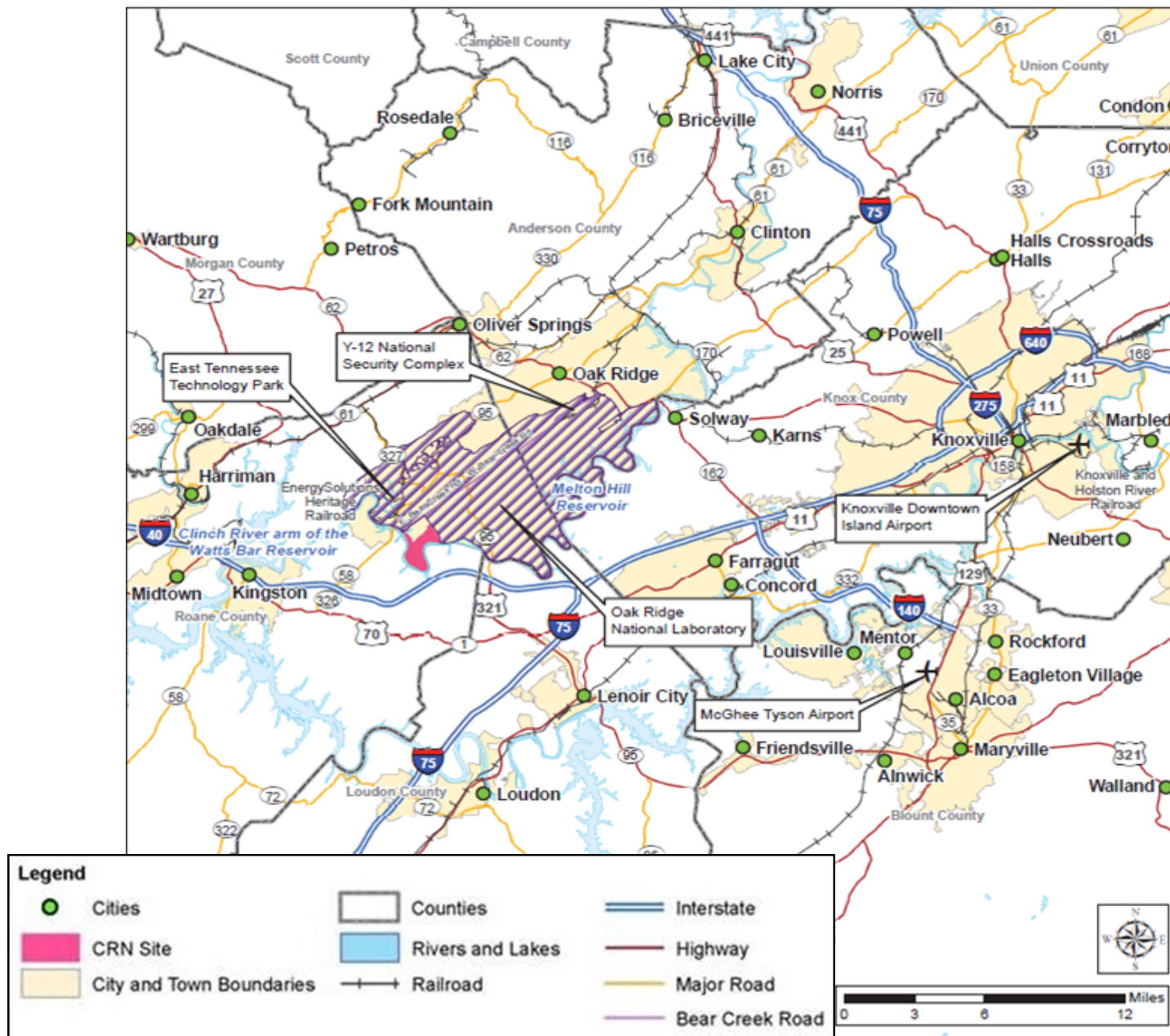
**The CRN property encompasses 1200 acres of land adjacent to the Clinch River arm of the Watts Bar Reservoir, within the City of Oak Ridge, Roane County, Tennessee.**

- Borders DOE Oak Ridge Reservation
- 6.8 miles east of Kingston, TN
- 9.2 miles east-southeast of Harriman, TN
- 8.8 miles southeast of Lenoir City, TN
- 25.6 miles west-northwest of Knoxville, TN

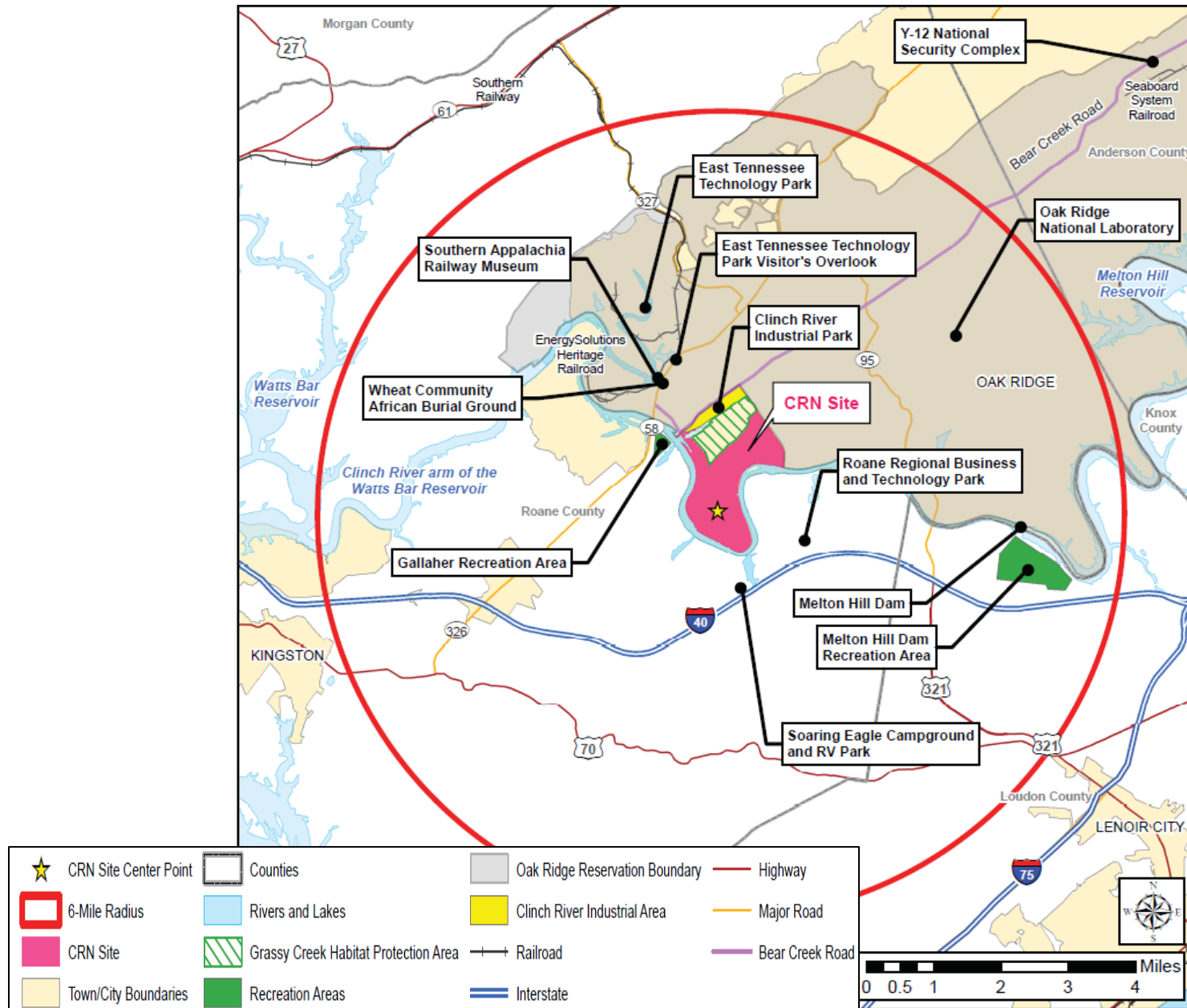
**The land is owned by the United States of America and managed by TVA as the agent of the federal government.**



# TVA ESP Site and Regional Vicinity

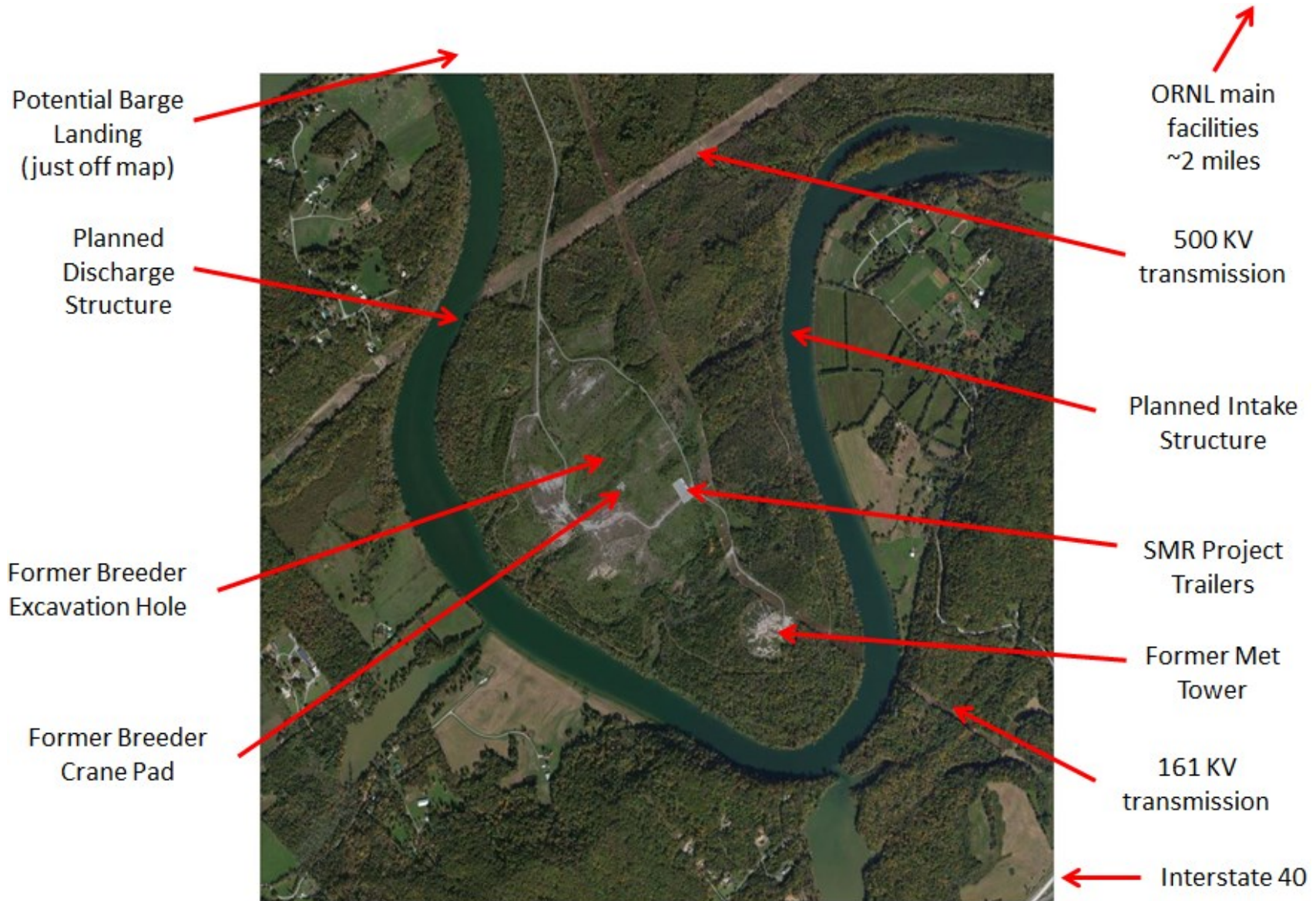


# TVA ESP Site and Local Vicinity





# TVA ESP Site – Points of Interest



# ESP Application Development

## Regulatory guidance to prepare the application

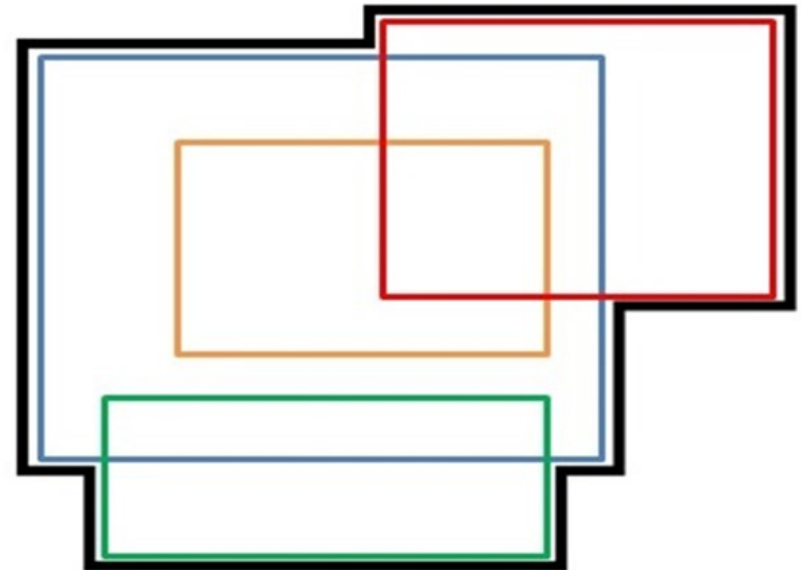
- 10 CFR Part 52, Subpart A
- RG 1.206 - Combined License Applications for Nuclear Power Plants (LWR Edition)
- NUREG – 0800 - Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition
- RS-002 – Processing Applications for Early Site Permits
- Appropriate Guidance Documents

# What is a Plant Parameter Envelope (PPE)?

**Composite of reactor and engineered parameters that bound the safety and environmental impact of plant construction and operation**

## **Considers 4 SMR Vendors**

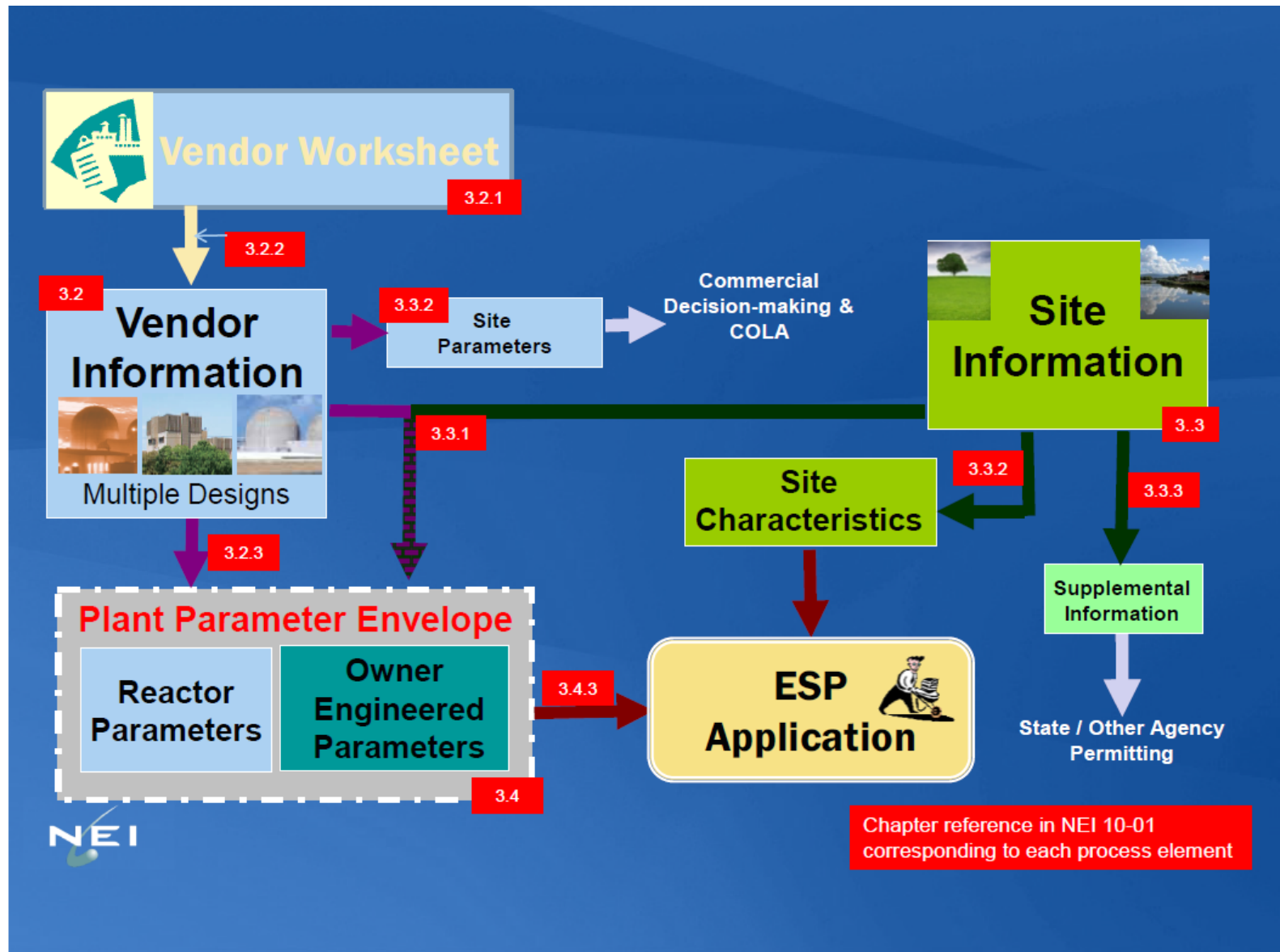
- BWXT mPower
- NuScale
- Holtec SMR-160
- Westinghouse



## **Developed based on NEI 10-01 Guidance**

- Margin added to specific parameters as appropriate
- Creates “Franken-plant” or a “Black Box Plant”

# Plant Parameter Development Process



# PPE Use Considerations

## **Includes Appropriate Conservatism**

- Prevents rework when vendor analysis is updated
- Safety conclusion becomes more apparent
- Document and, when possible, quantify conservatisms

**Allows use of multiple reactor designs, providing flexibility for future business decisions.**

## **An integral element of 10 CFR Part 52**

- Works well with a future COLA



# Conclusions

**TVA is exploring more generation options**

**SMRs have desirable attributes:**

- Safety
- Cost
- Operational and Deployment Flexibility

**An ESP would establish suitability of the Clinch River Site for potential future construction and operation of an SMR facility**

- Valid for up to 20 years
- Reduces future COLA licensing risk by achieving finality on most siting and environmental matters
- Addresses some regulatory policy issues such as appropriately-sized Emergency Planning Zones (EPZs)







# **Presentation to the ACRS Full Committee Early Site Permit Process Overview**

**November 15, 2017**

---

Joseph Colaccino, Branch Chief, NRO/DNRL/LB3

Allen Fetter, Project Manager, NRO/DNRL/LB3

Mallecia Sutton, Project Manager, NRO/DNRL/LB3

Office of New Reactors

# Purposes of Today's Meeting

---

- Describe what an Early Site Permit (ESP) is and how it fits into our licensing process
- Describe regulatory basis and ESP safety review process
- Discuss the Plant Parameter Envelope (PPE) concept
- Discuss ACRS Review, Hearings and ESP issuance
- Present Clinch River Nuclear Site ESPA review schedule
- Answer questions

# Early Site Permit (ESP)

---

- An ESP is an approval of the safety and environmental suitability of a proposed site to support future construction and operation of a nuclear plant
- An ESP does not allow for construction and operation of a nuclear plant
- Before a nuclear plant can be constructed and operated at a site with an ESP, a combined license application referencing a specific reactor technology for the site must be reviewed and approved by NRC

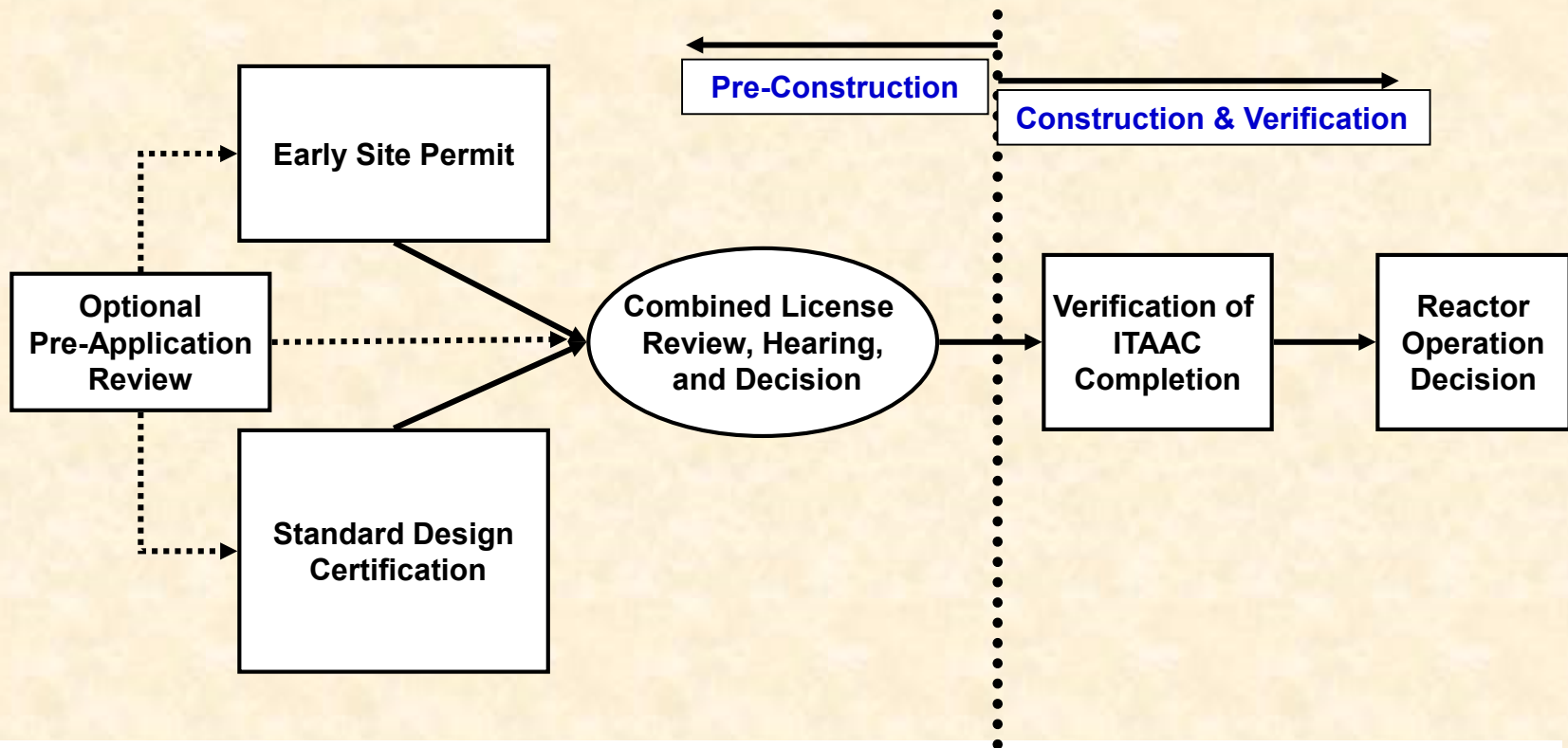
# Applicant Interest in Early Site Permits

---

- An applicant chooses an ESP to identify and resolve safety and environmental siting issues early, and to reduce regulatory and financial uncertainties when planning for the future
- An ESP is valid for up to 20 years, which gives applicants schedule flexibility for seeking approval to build a plant (COLA submittal)
- Because an ESP does not need to reference a specific reactor design, an applicant can be in a better position to negotiate offers from competing reactor technology vendors prior to submitting a COLA



# Part 52 - Fitting the Pieces Together



- Site preparation and preconstruction (non-safety-related construction) can take place before licensing decisions finalized
- Licensing decisions finalized before safety-related (nuclear) construction can begin
- Inspections with ITAAC to verify construction

# Regulations and Guidance

---

- Regulations:
  - 10 CFR 52, Subpart A
  - 10 CFR 50 (Emergency Planning & other areas)
  - 10 CFR 51 (Environmental Report)
  - 10 CFR 100 (Reactor Site Criteria)
- Guidance:
  - Review Standard (RS) 002
  - NUREG-0800 (Standard Review Plan)

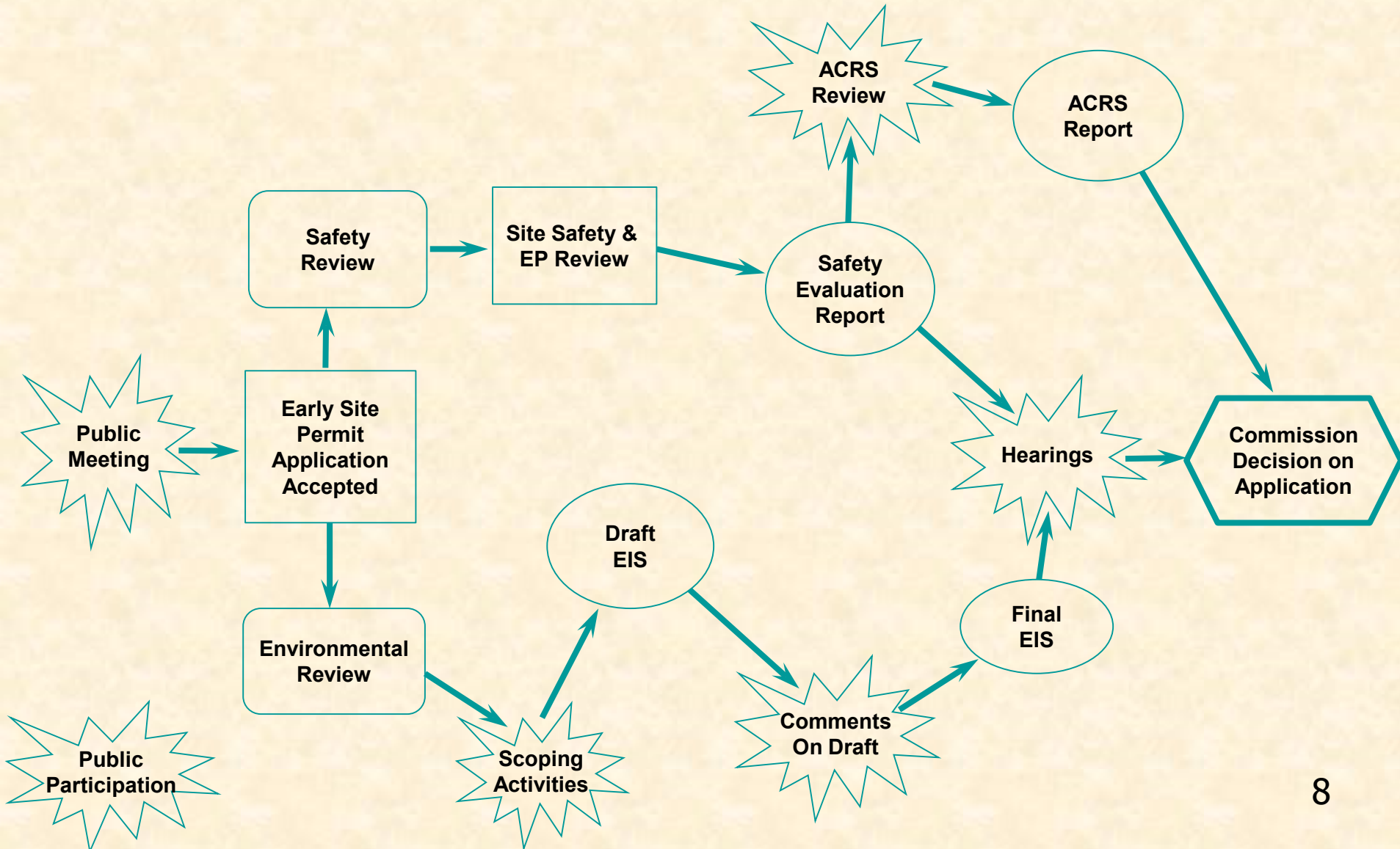
# Required Reviews for an ESP Application

---

- Atomic Energy Act, as amended, authorizes the NRC to protect public health and safety, and to provide for the common defense and security
- The safety review team creates a Safety Evaluation Report (SER) addressing
  - Site Safety
  - Emergency Planning
  - Security
- The environmental review team prepares an Environmental Impact Statement (EIS)



# Early Site Permit Review Process



# ESP Safety Review

---

- Site characteristics and areas reviewed include:
  - Seismology
  - Geology
  - Hydrology
  - Meteorology
  - Geography
  - Demography (population distribution)
  - Site Hazards Evaluation
  - Radiological Effluent Releases
  - Radiological Dose Consequences
  - Emergency Preparedness (with FEMA)
  - Security Plan Feasibility

# ESP Plant Parameter Envelope (PPE)

---

## **Approving an ESP Site without a Selected Reactor Technology**

- ESP Plant Parameter Envelope (PPE) values can bound a variety of reactor technologies rather than one specific technology (an amalgam of values representing a surrogate nuclear plant)
- The PPE values are bounding criteria used by staff to determine the suitability of an ESP site for construction and operation of a nuclear plant
- At the COL stage, when a specific technology is identified, the ESP PPE values are compared to those of the selected technology. If design parameters of the selected technology exceed bounding ESP PPE values, additional reviews are conducted to ensure that the site remains suitable from a safety and environmental standpoint for construction and operation of the selected nuclear plant technology

# ESP Plant Parameter Envelope (PPE)

Plant Parameter Envelope (PPE) – continued

TVA used the following reactor designs to develop the Plant Parameter Envelope (PPE):

- BWXT mPower SMR, 530 MWt (180 MWe)
- NuScale SMR, 160 MWt (50 MWe)
- Holtec SMR-160, 525 MWt, (160 MWe)
- Westinghouse SMR, 800 MWt (225 MWe)

TVA's PPE is based on construction and operation of two or more SMRs at the CRN Site with a nuclear generating capacity of 2420 MWt (800 MWe)

# ACRS Review

---

## ACRS Review

- ACRS reviews each ESP application and staff's Safety Evaluation Report (SER)
- ACRS reports to Commission on safety portions of ESP application

# Hearings

---

## Hearings

- Procedural Requirements in 10 CFR Part 2
- Hearing takes one of two forms:
  - Uncontested (but still mandatory) by ASLB
  - Contested when contentions are admitted (on October 10, 2017, the ASLB admitted two contentions)



# ESP Issuance

---

**Commission issues ESP with terms and conditions, as it deems appropriate**

## **ESP Terms**

- Valid for up to 20 years
- Renewal application – between 1 and 3 years before expiration of permit
  - Must contain information necessary to bring previous application up-to-date
  - Good for up to an additional 20 years

# ESPs Issued and Under Review

---

- The NRC has issued five ESPs:
  - Clinton (IL) - March, 2007
  - Grand Gulf (MS) - April, 2007
  - North Anna (VA) - November, 2007
  - Vogtle (GA) - August, 2009
  - PSEG (NJ) - May, 2016
- The NRC is currently reviewing the Clinch River Nuclear Site ESP application



# Clinch River Nuclear Site ESP Application Review Schedule

- Application accepted for docketing and detailed technical review on December 30, 2016. FRN on acceptance decision published January 12, 2017
- Phase A (Preliminary Safety Evaluation Report (SER) sections prepared and initial RAls issued): Completed August 4, 2017 (on schedule)
- Phase B (Development of Advanced SE sections with No Open Items): August 5, 2017 to October 20, 2018. Some sections are expected to be ready for ACRS subcommittee review by late-May 2018
- Phase C (ACRS Review and Meetings on Advanced SE): June 2018 to March 26, 2019 (ACRS Report)
- Phase D (Final SER Issuance): August 17, 2019

# Early Site Permit

---

Questions?