UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of SOUTH CAROLINA ELECTRIC & GAS CO. and SOUTH CAROLINA PUBLIC SERVICE AUTHORITY (ALSO REFERRED TO AS SANTEE COOPER) Virgil C. Summer Nuclear Station, Units 2 and 3	Docket Nos. 52-027-COL and 52-028-COL

ORDER
(Setting Deadline for Proposed Transcript Corrections)

The Commission held an evidentiary hearing on October 12-13, 2011, at its Rockville, Maryland headquarters, to receive testimony and exhibits in the uncontested portion of the captioned proceeding. The hearing transcript is appended to this Order. Pursuant to my authority under 10 C.F.R. § 2.346(a) and (j), the parties may file any proposed transcript corrections no later than October 24, 2011. The parties may coordinate their responses and file a joint set of corrections. The filings should comply with the Commission's E-Filing rules (at 10 C.F.R. § 2.304(g)).

IT IS SO ORDERED.

For the Commission

[NRC SEAL]

/RA/

Annette L. Vietti-Cook
Secretary of the Commission

Dated at Rockville, Maryland,
this 17th day of October, 2011

United States of America

Nuclear Regulatory Commission

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IN THE MATTER OF DOCKET NO: 52-027-COL and

SOUTH CAROLINA ELECTRIC AND GAS 52-028

COMPANY AND SOUTH CAROLINA PUBLIC

SERVICE AUTHORITY (ALSO REFERRED

TO AS SANTEE COOPER)VIRGIL C. SUMMER

NUCLEAR STATION, UNITS 2 AND 3

Wednesday,

October 12, 2011

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Rockville, Maryland

The hearing commenced in Rockville, Maryland, at 9:00 a.m.

BEFORE:

Gregory B. Jaczko, Chairman

Kristine L. Svinicki, Commissioner

George Apostolakis, Commissioner

William D. Magwood, IV, Commissioner

William C. Ostendorff, Commissioner

APPEARANCES:

On Behalf of the United States Nuclear Regulatory Commission:

Jody C. Martin

Counsel for NRC Staff

U.S. Nuclear Regulatory Commission

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On Behalf of Southern Nuclear Operating Company:

Kathryn M. Sutton, Esq.

MORGAN, LEWIS & BOCKIUS LLP

1111 Pennsylvania Avenue, NW

Washington, DC 20004

EXHIBITS:	MARK	ADMT	WITH	RJCT
Party: Southern Nuclear Operating Company				
Exhibit No.: SNCE1	110	110		
Exhibit No.: SNCE2	110	110		
Exhibit No.: SNCE3	110	110		
Exhibit No.: SNCE4	110	110		
Exhibit No.: SNCE5	110	110		
Exhibit No.: SNCE6	110	110		
Exhibit No.: SNCE7	110	110		
Exhibit No.: SNCE8	110	110		
Exhibit No.: SNCE9	110	110		
Exhibit No.: SNCE10	110	110		

EXHIBITS:	MARK	ADMT	WITH	RJCT
Exhibit No.: SNCE11	110	110		
Exhibit No.: SNCE12	110	110		
Exhibit No.: SNCE13	110	110		
Exhibit No.: SNCE14	110	110		
Exhibit No.: SNCE15	110	110		
Exhibit No.: SNCE16	110	110		
Exhibit No.: SNCE17	110	110		
Exhibit No.: SNCE18	110	110		
Exhibit No.: SNCE19	110	110		
Exhibit No.: SNCE20	110	110		
Exhibit No.: SNCE21	110	110		
Exhibit No.: SNCE22	110	110		

EXHIBITS:	MARK	ADMT	WITH	RJCT
Exhibit No.: SNCE23	110	110		
Exhibit No.: SNCE24	110	110		
Exhibit No.: SNCE25	110	110		
Exhibit No.: SNCE26	110	110		
Party: Nuclear Regulatory Commission				
Exhibit No.: NRC1	111	111		
Sub parts A through BD.				
Exhibit No.: NRC2	111	111		
Sub part A through BH.				
Exhibit No.: NRC3	111	111		
Exhibit No.: NRC4	111	111		
Exhibit No.: NRC5	111	111		

EXHIBITS:	MARK	ADMT	WITH	RJCT
Exhibit No.: NRC6 Sub parts A and B.	111	111		
Exhibit No.:NRC7	111	111		
Exhibit No.:NRC8	111	111		
Exhibit No.:NRC9	111	111		
Exhibit No.:NRC10	111	111		
Exhibit No.:NRC11	111	111		
Exhibit No.:NRC12	111	111		
Exhibit No.:NRC13	111	111		
Exhibit No.:NRC14	111	111		
Exhibit No.:NRC15	111	111		
Exhibit No.:NRC16	111	111		

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

9:00 a.m.

CHAIRMAN JACZKO: Good morning, I now call this hearing to order. We are here to conduct a mandatory hearing as required by Section 189A of the Atomic Energy Act on South Carolina Electric and Gas Companies combined license application to build and operate two new reactors at the Virgil C. Summer site near Jenkinsville, South Carolina.

In reviewing new reactor application the NRC has a responsibility to carefully analyze and thoroughly scrutinize the important safety, security, and environmental issues involved in constructing and operating a nuclear power plant. For the past three years the NRC staff, drawing on the very talents and expertise of this agency, has worked diligently to complete the necessary safety and environmental reviews. In conducting this mandatory hearing the Commission's roll is to serve as a check on that work. Our job is to determine whether those reviews have been adequate to support the necessary regulatory findings. Those findings fall into two categories: safety and environmental. They include whether the staff's environmental analysis meets the requirements of the National Environmental Policy Act, whether the applicant has the necessary technical and financial resources, and ultimately whether the facility will be constructed and operated safely and securely. A detailed list of those findings was published as part of the notice for today's hearing.

Today's hearing on the Vogtle application just two weeks ago,

although the structure of today's hearing will be very similar to that one, its subtenant focus will differ somewhat. Since we discussed many of the generic design issues for the AP1000 at the previous hearing we will focus to a greater extent on site specific issues.

Also, the Commission will examine the full breadth of the final environment impact statement in today's hearing because an early site permit was not completed for this application, which would have addressed certain environmental issues and resolve them. The mandatory hearing is one of the final steps in our licensing process. The Summer application, in fact, is only the second to reach this step in the Part 52 new reactor licensing process; so it's not as historic as the first one was, but maybe it's historic as the second one.

The Commission is committed to moving forward with this hearing and reaching a decision on this application in a thoughtful, timely manner that befits the important safety, security, and environmental issues under review. I want to thank my colleagues for their efforts in preparing for this important hearing, as well as the many NRC staff who have worked on this application.

Would any of my colleagues like to make any opening remarks. Okay, then we have some house keeping things we need to do before we start so I'm going to try and go through this fairly expeditiously.

Before we begin with the presentations I will swear in the witness's and formally admit the written testimony and other exhibits into the record. Following that we will turn to the presentations, starting with the applicant's overview panel, and then moving to the

staff overview panel. We expect the hearing to continue through tomorrow. After we have heard from all of the panels we will conclude with closing statements from both parties and final questions, and concluding statements from each of the Commissioners.

Could I have the two counsels come to the table? So, first we'll go through witnesses, both the staff and the applicant have provided their witness list in advance. The witnesses should please stand as their names are called and remain standing until we finish with the process. Counsel for the applicant will read his witness list first. Counsel, clearly identify - I'm sorry, her list -- that's what happens when you just read this.

KATHRYN SUTTON: I understand.

CHAIRMAN JACZKO: I apologize for that. Please clearly identify for the record any witnesses who are absent. Counsel?

KATHRYN SUTTON: Good morning Mr. Chairman and commissioner's, my name is Kathryn Sutton, I'm a partner in the law firm of Morgan, Lewis, and Bockius. I'm here today to represent South Carolina Electric and Gas Company, the applicant in this proceeding, along with the other members of the legal team who are also representing this company.

As instructed on how the names of the applicant's witnesses into the record in alphabetical order and I reiterate that they should stand and remain standing until sworn in by the Chairman. Stephen A. Byrne, Dave H. Carroll, Ronald B. Clary, Julie M. Giles, James C. LaBorde, Gerald A. Raymond, Jr., Lisa A. Matis, Amy M. Monroe, Alfred M.

Paglia, Jr., April R. Rice, Timothy W. Schmidt, Mark E. Stella, Stephen E. Summer, Allan D. Torez, Robert B. Whorton, and Robert E. Williamson, III, and Mr. Chairman that completes the list of applicant's witnesses.

CHAIRMAN JACZKO: Thank you. Counsel for the staff please read your list, clearly identifying for the record any witnesses who are absent.

JODY MARTIN: Good morning Chairman and Commissioner's my name is Jody Martin, I'm counsel for NRC staff and NRC Office General Counsel. We have a long list today, please stand when I call your name, Michael Johnson, Frank Akstulewicz, Joseph Sebrosky, Donald Habib, Michelle Hayes, John Segala, Kevin Quinlan, John Budzynski, Shie-Jeng Peng, Raul Hernandez, Larry Wheeler, David Brown, Aaron Szabo, John McKirgan, Kenneth See, Gerry Stirewalt, Sarah Tabatabai, Malcolm Patterson, Bret Tegeler, Mohamed Shams, Daniel Barnhurst, Weijun Wang, Rebecca Karas, Christopher Cook, Daniel Barss, Kevin Williams, Edward Roach, Tania Martinez-Navedo, Robert Schaaf, Yi-Hsiung Hsii, Eileen McKenna, James Beardsley, Mark Kowal, Theodore (Bob) Tjader, Om Chopra, Joseph Donoghue, Jerry Wilson, Earl Libby, Juan Peralta, Eric Oesterle, Lynn Mrowca, Marc Caruso, Eric Powell, Jennifer Dixon-Herrity, Thomas Scarbrough, Terry Jackson, Scott Flanders, Ryan Whited, Patricia Vokoun, Andrew Kugler. The next witness is not here, Barry Zalcman won't be here until tomorrow.

CHAIRMAN JACZKO: Let me just make a note then if he does speak that we'll need to swear him in tomorrow.

JODY MARTIN: Okay. We have Nancy Kuntzleman, Jack Cushing, Daniel Mussatti, Donald Palmrose, Michelle Hart, Nancy Kohn, and David

Anderson, CHAIRMAN JACZKO: Okay. Well thank you. Now, what I'll need from all of you is to raise your right hands and then I'll need a verbal response from each of you in turn and in order so that we can see everybody who's behind, well start at the left and work our way back, and then start here at the left and then work our way back and then I'll ask you to please be seated after your provide your individual response to the following: Do you swear or affirm that the testimony you will provide in this proceeding is the truth, the whole truth and nothing but the truth?

STEPHEN A. BYRNE: Yes.

DAVE H. CARROLL: Yes.

RONALD B. CLARY: Yes.

JULIE M. GILES: Yes.

JAMES C. LABORDE: Yes.

GERALD A. RAYMOND, Jr.: Yes.

LISA A. MATIS: Yes.

AMY M. MONROE: Yes.

ALFRED M. PAGLIA JR.: Yes.

APRIL R. RICE: Yes.

TIMOTHY W. SCHMIDT: Yes.

MARK E. STELLA: Yes.

STEPHEN E. SUMMER: Yes.

ALLAN D. TOREZ: Yes.

ROBERT B. WHORTON: Yes.

ROBERT E. WILLIAMSONM III: Yes.

MICHAEL JOHNSON: Yes.

FRANK AKSTULEWICZ: Yes.

JOSEPH SEBROSKY: Yes.

DONALD HABIB: Yes.

MICHELLE HAYES: Yes.

JOHN SEGALA: Yes.

KEVIN QUINLAN: Yes.

JOHN BUDZYNSKI: Yes.

SHIE-JENG PENG: Yes.

RAUL HERNANDEZ: Yes.

LARRY WHEELER: Yes.

DAVID BROWN: Yes.

AARON SZABO: Yes.

JOHN MCKIRGAN: Yes.

KENNETH SEE: Yes.

GERRY STIREWALT: Yes.

SARAH TABATABAI: Yes.

MALCOLM PATTERSON: Yes.

BRET TEGELER: Yes.

MOHAMED SHAMS: Yes.

DANIEL BARNHURST: Yes.

WEIJUN WANG: Yes.

REBECCA KARAS: Yes.

CHRISTOPHER COOK: Yes.

DANIEL BARSS: Yes.

KEVIN WILLIAMS: Yes.

EDWARD ROACH: Yes.

TANIA MARTINEZ-NAVEDO: Yes.

ROBERT SCHAAF: Yes.

YI-HSIUNG HSII: Yes.

EILEEN MCKENNA: Yes.

JAMES BEARDSLEY: Yes.

MARK KOWAL: Yes.

THEODORE (BOB) TJADER: Yes.

OM CHOPRA: Yes.

JOSEPH DONOGHUE: Yes.

JERRY WILSON: Yes.

EARL LIBBY: Yes.

JUAN PERALTA: Yes.

ERIC OESTERLE: Yes.

LYNN MROWCA: Yes.

MARC CARUSO: Yes.

ERIC POWELL: Yes.

JENNIFER DIXON-HERRITY: Yes.

THOMAS SCARBROUGH: Yes.

TERRY JACKSON: Yes.

SCOTT FLANDERS: Yes.

RYAN WHITED: Yes.

PATRICIA VOKOUN: Yes.

ANDREW KUGLER: Yes.

BARRY ZALCMAN: Yes.

NANCY KUNTZLEMAN: Yes.

JACK CUSHING: Yes.

DANIEL MUSSATTI: Yes.

DONALD PALMROSE: Yes.

MICHELLE HART: Yes.

NANCY KOHN: Yes.

DAVID ANDERSON: Yes.

CHAIRMAN JACZKO: Okay, thank you. We have four I do's and the rest were all yes's.

[laughter]

CHAIRMAN JACZKO: So, what that means, I guess it's faster, one word rather than two. Okay well, thank you. The witnesses present as identified by counsel have been sworn in and there was only one then Barry Zalcman so we'll make sure to make a note to - if he does speak to make sure to swear him in. And I would remind all of the witnesses that if you do come to the podium to make sure that you state your name and your position. Are there any objections then to admitting the witness list into the record?

JODY MARTIN: No objection.

KATHRYN SUTTON: No objections.

CHAIRMAN JACZKO: Hearing none the witness lists are admitted into the record of this proceeding.

We'll now turn to admission of evidence. Pursuant to our September 28th scheduling order, both the staff and the applicant have

provided to the secretary a table listing all of the exhibits they intend to propose for admission to evidence at the hearing. For those exhibits that are written testimony the sponsoring witnesses have provided written certification that the testimony was prepared by the witness or under the witness's direction, that the witness testimony is true and correct to the best of the witness's information, knowledge and belief, and that the witness adopts the identified testimony as his or her sworn testimony in the proceeding.

Counsel for the applicant, do you have any additions, deletions, or changes to your revised exhibit list served on October 5th or to the testimony included in your revised exhibit list?

KATHRYN SUTTON: No, Mr. Chairman.

CHAIRMAN JACZKO: Hearing none let the record reflect that the applicant's exhibits have been identified and marked as indicated on the applicants revised exhibits list.

(Whereupon, the documents referred to were marked identification.)

CHAIRMAN JACZKO: Counsel for the staff, are there any objections to the admission of the revised exhibit list or any of the exhibits listed in the table?

JODY MARTIN: No objections, Mr. Chairman.

CHAIRMAN JACZKO: Hearing none the exhibits lists and Exhibits SCE1 through SCE26 are admitted into the record.

(Whereupon, the documents referred to were marked as Exhibits SCE1 through SCE26 for identification.)

CHAIRMAN JACZKO: Staff exhibits, counsel for the staff, do

you have any additions, deletions, or changes to your exhibit list served on October 5th or to the testimony included in your exhibit list?

JODY MARTIN: No.

CHAIRMAN JACZKO: Hearing none let the record reflect that the staff exhibits have been identified and marked as indicated on the staff's exhibit list.

(Whereupon, the documents referred to were marked as Exhibits for identification.)

CHAIRMAN JACZKO: Counsel for the applicant, any objections to the admission to these exhibits?

KATHRYN SUTTON: No objection.

CHAIRMAN JACZKO: Hearing none the staff exhibits list and the following exhibits are admitted into the record:

NRC1, sub parts A through BD.

NRC2, sub part A through BH.

NRC3 through 5.

NRC6, sub parts A and B.

NRC7 through NRC 16.

(Whereupon, the documents referred to were marked as Exhibits for identification.)

CHAIRMAN JACZKO: Okay, with that we're ready to proceed to the presentations, thank you.

So, under the first panel, which will be the applicant overview, would all the witnesses please come to their seats and then after you're seated all seated please state your name and title for the

record and then you'll have 30 minutes for your portion of the presentation. I think we're going to do the applicant first, so if you all give us room to seat them.

Okay, so again, if you each state your name and title for the record and then begin your presentations.

STEVEN BYRNE: My name is Steven A. Byrne, I'm the executive vice president for Transmission Generation and I'm the chief operating officer for the utility South Carolina Electric and Gas for SCE&G.

ALFRED PAGLIA: And I'm Al Paglia, I'm manager of nuclear licensing for new nuclear deployment South Carolina Electric and Gas.

AMY MONROE: I'm Amy Monroe, licensing engineer New Nuclear Deployment, South Carolina Electric and Gas Company.

APRIL RICE: I'm April Rice, I'm the licensing supervisor in environmental projects review manager for the Units two and three for SCE&G.

CHAIRMAN JACZKO: Please begin whenever you're ready.

STEVEN BYRNE: If we could have our first slide up please. Or second slide, please.

Good morning Mr. Chairman and Commissioners, on behalf of SCE&G and its co-applicant state owned utility Santee Cooper, I'd like to thank the Commission for conducting this mandatory hearing for two new nuclear units utilizing AP1000 design at the VC Summer Nuclear Station. This is indeed an important milestone in the licensing of these two new units, reaching this milestone as the first subsequent combined license application, or COLA, is the culmination of tremendous

effort, not only by SCE&G but also the NRC staff, our New Start counterparts Santee Cooper, and the consortium that consists of Westinghouse and Shaw Stone Webster.

By way of background the new nuclear units of VC Summer site will be located in Jenkinsville, South Carolina, approximately 26 miles northwest of Columbia. The new units will be located adjacent to VC Summer Unit Number 1 of Westinghouse pressurized water reactor that has been in commercial operation since 1984. We chose nuclear over any other energy alternatives for four main reasons, first a need for base load power, the new units will help move state regulatory reserve marginal requirements.

Second cost, nuclear is competitive with other base load options over -- when evaluated over its 40 year design life.

Third is fuel diversity, adding Units 2 and 3 will increase the share of nuclear in our fuel portfolio from approximately 11 percent to approximately 30 percent, meaning that our generation nets will be roughly evenly split between coal, natural gas, and nuclear.

And fourth is its low greenhouse gas emissions. SCE&G initiated its new nuclear development program in 2005 when I was the chief nuclear officer, following a competitive bid process we selected the AP1000 as our design for a variety of reasons, chief among them being our familiarity with the pressurized reactor technology, it's passive safety features, and the opportunity to collaborate with other utilities in the southeast who also chose the same AP1000 design.

Furthermore, our integrative resource plan, or IRP, filed

annually with the South Carolina Public Service Commission, or PSC, fully supports the need for base load power that will be produced by Units 2 and 3. In 2008 South Carolina PCS held public hearings on nuclear power and approved construction of the new units in February of 2009 by a unanimous seven to nothing vote. Factor in the new nuclear units into our integrated resource plan allows to retire older, less efficient coal units.

As I just mentioned, the development of our combined license application has been a resource intensive activity. More than a quarter million personnel hours have gone into the preparation, submittal, and support of the NRC's staff review of the VC Summer combined license application, including those of SCE&G and its principal contractors.

The NRC staff's review has been a thorough, robust, and comprehensive, we responded to over 700 requests for additional information from the staff encompassing both safety and environmental topics. In addition, we've supported NCR staff audits, inspection activities, and public meetings. SCE&G is confident in the staff's safety and environmental findings; we stand ready to answer the Commission's questions about the combined licensing application and our role in the review by the staff.

Mr. Al Paglia will now continue with our overview presentation, he will describe the VC Summer site and discuss the status of pre-construction activities. And as you will see we are prepared for the issuance of the combined licenses, approximately 1,000 personnel are currently working at the site, and of those about 60 percent of the

staff are from South Carolina, living up to our obligation for local jobs for local people. The combined license will enable SCG&E to construct and operate VC Summer Units 2 and 3 by 2016 and 2019 respectively. Thank you.

ALFRED PAGLIA: In order to give you a more visual image of the site I'd like to provide a geographical description and some photographs. The VC Summer site is located in the central Piedmont section of South Carolina, approximately 140 miles from the Atlantic Coast, near the small town of Jenkinsville. The site itself is 400 feet above sea level. The state capital and the nearest population area is 26 miles to the southeast. Next slide please.

This photo shows the location of two of the existing SCE&G existing facilities located at the site and this view is looking to the southeast. Unit 1 is located on the edge of Monticello Reservoir, this is an approximately 6,800 acre lake and currently provides the circulating water for Unit 1, and it's the upper reservoir for the Fairfield pump storage facility. 300 acres of this reservoir is specifically impounded for public recreational use. The pump storage facility draws down Monticello Reservoir about four feet daily and the generation mode, and then pumps water back up from the Par reservoir to Monticello into refill mode.

Monticello Reservoir will also be the source of water, makeup water, for the cooling towers of Units 2 and 3. And Units 2 and 3 are located just to the south of Unit 1, they will provide - next slide please.

The next few photos intended to show you the geographical progression of the development of the site, this photo was taken in September of 2006 and is looking north and shows the rural, sparsely populated nature of the area. The rolling hills indicative of the topography of the area can be seen. Units two and three are situated at a higher elevation relative to the surrounding areas to the east, to the south, and the west. Drainage from the plant site to the left is to the Par Reservoir and the Broad River, drainage to the right is to the Mayo Creek drainage system which ultimately drains to the Broad River south of the plant.

The Par Reservoir, which is off to the left of the photo, is at an elevation of about 260 feet above sea level. So given the topography of the area and the differences in the elevation the site is not subject to flooding from the Monticello Reservoir. Next slide please.

This photo was taken in November 2008 and it shows the tree harvesting that was really nearing completion at that time. Next slide please.

This photograph was taken in November of 2009 and shows the site grading that was under way in the area that we refer to as the table top, the units will be located essentially on the table top, essentially in the center of that photograph. Next slide please.

In this photo, taken about one year ago, you can see the extensive amount of development work and preconstruction work that has been completed. The large bridge there in the lower right hand corner

of the photograph was constructed in order to cross Mayo Creek and span of that bridge covers the -- encompasses the buffer zone on either side of the creek to eliminate any impact in associated wetlands. The cleared land in the center of the photograph is the location of the batch plants, there you see the first of the two that's been built. The large white structure in the upper middle is the module assembly building and you can see switch yard in the upper left corner. Next slide please.

In this photo, taken in May of this year, you can get a much better view of the excavation of Unit 2 and the beginning of the excavation of Unit 3. There's 900 feet separation between the center lines of the nuclear islands. The heavy lift derrick crane is being fabricated between the excavations and of course will be used to handle the heavy models. You also see that cooling down foundation work going in in the upper section and the containment vessel fabrication area at the bottom. Next slide please.

So, this photo shows the Unit 2 excavation in July of this year subsequent to the completion of the removal of a rock necessary for the foundation. And the new units to the site are considered to have hard rock foundation interfaces which are ideal for the AP1000 design. The features of the rock have been thoroughly investigated and what we found was what we expected and as categorized in chapter two of the FSAR. The mapping and documented section activities confirmed and concluded that there are no capable tectonic features in this rock. Very similar rock conditions were identified in the excavation of Unit

1. And currently we've excavated to the top of rock at Unit 3 and we're finding similar conditions.

The NRC's conducted two visits to the site to evaluate the rock at Unit 2 to satisfy the license condition which was satisfied, they made one visit to Unit 3, and they'll be back in about six months for the final visit to evaluate the rock once we fully excavated for the foundation work. Next slide please.

Now I'd like to provide a brief description of the contents of our COL application. On March 27, 2008 we submitted the COLA for the VCS Units 2 and 3, concluded the contents as required by Part 52 and the current COLA incorporates our reference the AP1000 amendment Rev. 19.

Following the design centered working group approach we are the first AP1000 subsequent COLA, or SCOLA to be reviewed by the Commission. The guidance found in Regulatory Guide 1.206, NUREG 0800, NUREG 1555 realized the development of the COLA. Also in the interest of standardization several NRC recognized industry templates were also utilized.

So we found over the course of development and review of the COLA the design centered working group approach, the standardized approach to review and development was very efficient and it provided for cost beneficial utilization of industry resources. Now, I'll turn over to Amy Monroe who's going to provide a more detailed overview of the safety contents of the COLA.

AMY MONROE: Good morning Mr. Chairman, commissioners. The current license application for the two proposed VC Summer Units

references the AP1000 design and as such incorporates Revision 19 of the AP1000 amendment.

Utilizing this design centered working group approach, the VC Summer Units 2 and 3 COLAs considered subsequent COLA, or SCOLA, and so our application is organized into parts consistent with the Reference COLA, or the RCOLA. These parts have been listed and provided in our written testimony.

Of the 17 total parts of our application, 10 of these parts contain information that is standard in nature or created utilizing an AP1000 template approach, while half of these 10 parts have essentially identical information to that that was in the RCOLA.

As a number of New Start, SCE&G participated in the review of the RCOLA documents and the material along with other members in the group. The participation in the design centered working group approach offered the benefit of combining the technical resources of all participating members in the document and issue reviews, while effectively increasing the experience level of each individual utility to the experience level of the collective group. This allowed all the design centered working group members to benefit from the technical expertise of the specialized resources each company brought to the table. We believe this document review process helps to ensure the standard RCOLA material was of the highest possible quality.

Subsequent to the standard material being adopted by the RCOLA, the SCE&G review process required an additional review of the standard material prior to adopting into our licensing basis. This review

confirmed that the standard material had not changed from the previous review and that any unique site specific issues had not had an impact on the accessibility of incorporation of standard material into the VC Summer licensing basis.

The design centered working group approach has evolved as of the last five years. We believe that for the industry it has been significantly more efficient in the development of the standard material, while the internal review of the developed material requires similar individual company resource commitments, the overall quality of the product is improved and becomes a significant benefit. In our case, we believe we've also obtained considerable benefit from following the DCD and the RCOLA reviews morning so closely in time, while the concurrent review schedules has been challenging we feel it's provided for significant consistency in the review process. Next slide please. Next slide again please.

The application contains the information required in 10CFR Part 52. In general 10CFR Parts 50.73, 75, and 77 requirements are addressed in Part One of the application in Chapter 1 of the FSAR. Part 52.79 requirements address primarily in the FSAR, technical specifications, the emergency plan, and physical security plan.

The requirements contained in Part 52.8 are located in Part 10 of the COLA which identifies the ITAAC to be incorporated into the license. And COLA, Part 3 the environmental report.

The general information and financial requirements found in Part 50.33 are located primarily in our Part One, and the emergency plan

information in Part Five addresses the requirements of 50.33(g) and contains the state and local governmental emergency response plans.

We are in compliance with the requirements of appendix D to Part 52 with two exemptions that we'll discuss shortly. In both cases these exemptions were determined to be technically justified and acceptable. Guidance contained in Regulatory Guide 1.206 and NUREG 0800 was utilized the structure of the application and the FSAR specifically. Information in Reg. Guide 1.206 was used to provide the basis for both content and format of the application.

Subsequent to the NRC's staff review of the application the final safety evaluation report was issued in August 2011. Next slide please.

In the interest of standardization, minimal departures from the standard materials are found in the application. Two departures were actually introduced as standard departures in the RCOLA. One was administrative in nature and addressed FSAR numbering and organization, and the other dealt with a design clarification of the voltage regulating transformer.

As and SCOLA we also adopted these departures. Three site specific departures were incorporated: an administrative and organizational departure very similar to the standard one was included for Chapter Two. A departure to relocate the emergency response facilities, specifically the technical support center and the operational support facilities was also requested to allow the implementation of more comprehensive site wide emergency response

organization. Relocation of the technical support center TSC provides the ability to respond and activate the TSC in a timely fashion, independent of the unit that may be affected by the emergency. It also permits the use of the TSC in a security net that may curtail the entry of emergency response organization personnel into the protected area of the affected unit.

Lastly, a departure was necessary to ensure applicable plant structure, systems and components were appropriately addressed in the FSAR when it was determined that the DCD specified site parameter of maximum safety wet bulb [spelled phonetically], non-coincident air temperature was slightly below the value for the site. This departure will be discussed in greater detail in the panel later today. Next slide please.

As with the departures, the VC Summer COLA also reflected standard exemptions proposed by the RCOLA. One exemption was to deviate from the DCD numbering an organization for a more consistent formatting with the COLAs. The other standard exemption was to allow for specific exemption from the Part 70 materials control and accountability program description to make the applicable requirements for a Part 52 licensee, equivalent to those of a Part 50 licensee.

The single site specific exemption was requested due to the calculated wet bulb temperature that was slightly greater than the DCD site parameter requirement by a value of only 1.2 degrees Fahrenheit, a value of 87.3 Fahrenheit for us versus 86.1 degrees Fahrenheit of the DCD. In support of this exemption request, an analysis was performed to

evaluate the impact of slightly elevated temperature and the results confirmed that no safety related structures, systems or components were adversely impacted. This concludes my overview of the safety components of the VC Summer Units 2 and 3 COLA. And now April Rice will discuss the environmental aspects. Next slide please, April?

APRIL RICE: Thank you. Good morning Mr. Chairman, commissioners. The environmental report was prepared using the guidance of NUREG 1555, the environmental standard review plan. Two revisions to the ER were submitted to address NRC requests for additional information and changes made as the project progressed. SCE&G did not pursue an early site permit so this is a standalone environmental report. An experienced team from SCANA [spelled phonetically] environmental services, new nuclear deployment licensing and engineering, Vectal and Tetra Tech prepared the report over a two year period. Table 1.3-1 of the ER demonstrates how the requirements of 10CFR Part 51 are met. Since the new plants are located on an existing site, we were able to take advantage of studies done during license renewal in 2002. In addition, we have ongoing monitoring for Unit 1 that we can utilize, such as radiological environmental monitoring for air, water, sediment, fish, vegetables and ground water, as well as thermal and chemical effluent monitoring. The FEIS for the project was published in April 2011 and it recommends what the COLs issues. Next slide please.

The ER is divided into chapters that address the following topics: Chapter One contains the purpose and need for the proposed action, Chapter Two describes the proposed site and environment, Chapter

Three the characteristics of the AP1000 design and its interface with the environment, Chapter Four the impacts of construction, Chapter Five the environmental impacts of operation, Chapter Six addresses environmental measurements and monitoring programs. Next slide.

Chapter Seven evaluates the environmental impacts of postulated accidents, Chapter Eight the need for power, Chapter Nine alternatives, and Chapter Ten evaluates the consequences, in other words the cost benefits of the project and Appendix A includes initial correspondence with regulatory agencies. Next slide.

The ER considers impacts to a wide range of resource areas. SCE&G conducted field studies and performed analyses and evaluations to assess these areas. For instance, SCE&G performed extensive cultural resource surveys of the Unit 2 and 3 site and adjoining SCE&G property, as shown in ER figure 2.5-5. The State Historic Preservation Office was consulted and concurred with our findings.

Also, detailed terrestrial and aquatic studies were conducted on the site and surrounding water bodies. These studies are describe in ER 2.4. The studies concluded that no federal, threatened or endangered species existed on the site. However, there is the state listed bald eagle nest on the site and those nesting locations are protected by the company. Additional details will be covered in environmental panel one. Next slide please.

SCE&G has been actively engaged in local, state and federal agencies during the development of the ER and as part of permit application for preconstruction activities. The bolded items indicate

the permits or approvals that have been obtained to date. Other permits and license amendments are under agency review, with most expected by the end of 2011 or early 2012. The comprehensive list of permits is contained in ER Chapter One. Next slide.

The ER concludes that for most resource areas the impacts are temporary, can be mitigated and are small. There are two exceptions: during construction, local Jenkinsville traffic impacts could be moderate to large during morning and evening shift change. To account for this SCE&G has already widened the intersection for the construction access road and provided new turning lanes. We staggered work shift times and we are working with the county and South Carolina DOT to install a traffic light by the end of the year. Traffic patterns continue to be monitored by the company and SCDOT and actions taken as needed.

Also during the construction of new transmission lines, the impact to land use is moderate due to conversion of forested areas to open scrub or grass lands. There is only six and a half miles of new transmission corridors that are required and approximately 40 miles will parallel existing corridors. The remainder is in existing transmission line corridors.

The benefits of the project include improved fuel diversity and emissions avoidance. Also, from a socio-economic standpoint, the project will provide several thousand construction jobs and at least 800 permanent jobs when the plant starts operation. These new workers will provide increased spending and the workers in the company will pay taxes

to federal, state and local governments. This concludes our presentation. Thank you.

CHAIRMAN JACZKO: Well thank you. We'll now proceed to questions, I believe. For this we have six minutes each. One of the issues that I have concern with this as we go forward is in the proper implementation of ITAAC if we do issue a license and this is a generic question I had asked this of Southern as well and I wanted to get your thoughts on it. I know, to some extent this is, I think, water under the bridge, we have put many ITAAC in place that in my mind are overly vague and they present challenges when we actually get into the process of implementing ITAAC. While the challenges I foresee is a lot of back and forth and discussion to try and resolve what those mean. A prehearing question I asked the staff if they would-- how they would approach these issues with ITAAC and the answer that they got back would ultimately be up to the staff interpret what an ITAAC meant and I asked Southern if they agreed with that assessment and their answer was yes. I'm going to ask you the same question, do you agree with that assessment, that if there uncertainty about the ITAAC that it is the staff that ultimately decides what the proper interpretation of the ITAAC is?

ALFRED PAGLIA: We do agree.

CHAIRMAN JACZKO: Thank you. If -- now can turn to another issue. Mr. Paglia, this is maybe just one I was a little bit confused about something you said. In regard, I think it was to the Unit 2 excavation there was rock exposed as part of the excavation, you said

the staff was conducting inspections, I think, in accordance with the license conditions. Can you explain what you meant by that?

ALFRED PAGLIA: Yes. The staff has made two visits to look at the rock at Unit 2. Actually they were audits and they were obviously able to examine the rock before we blasted to fully excavate and determine the condition and that was conducted. If that had not been conducted, earlier, it would be a conditioning license as we have a condition for the same review for the same review for the Unit 3 excavation.

CHAIRMAN JACZKO: Okay, that's why I was confused, we haven't issued a license yet so I wasn't sure you meant by licensed conditions. So it was that -- there would have been a license condition specifying something to the extent of the rock so -- and maybe I'll then ask the staff this question as -- I guess you can tell me whether that license condition is still in there or not.

JOSEPH SEBROSKY: This is Joe Sebrosky, I'm the lead safety project manager for the Summer C. application and I have been sworn. If you look at Chapter Two of the SER you'll see that the staff's basis for removing a license condition for Unit 2 is described in there and it's based on those two audits that Mr. Paglia referenced. One when they were at the top of rock before they did the blasting and then the second is one after they did the blasting we went down again and on that basis we removed the license condition. Dr. Gary Stywalt, we will be talking about that in more detail in safety panel two.

CHAIRMAN JACZKO: Okay, good. Thank you. You are historic

in this regard, you are the first reference COLA which is a new process that we use to establish a way to review all these designs in an efficient and effective way. During the licensing process -- I know there's been a process for these design working groups where proposed changes, proposed modifications to the design or to the standard content of the application will run through the group of all the applicants that are interested in potentially constructing this type of design. How do you intend to work to maintain that consistency through the actual construction phase if you are granted a license?

ALFRED PAGLIA: Beyond the COL, we intend to maintain standardization to the maximum extent possible and optimize the use of that one issue, one review process that works so well, in the development of COLA. But we recognized that over time, we believe that small differences due to operating experience and design preferences, will begin to develop between plants but again, over the long run we will tend to -- we will always try to maximize that standardization.

CHAIRMAN JACZKO: So will the kind of the groups stick together, I guess going forward, I'm more interested in how you intend to this, not so much that you intend to do it, but how? For instance, is Duke -- will they be part of the post-COL group as well even though they may not be a point at which they had a final decision on the license application.

ALFRED PAGLIA: I think you're aware the nuclear industry is fairly cooperative anyway and utilities from southeast I would argue are probably more collaborative with each other than even other areas in the

country. We have formed a limited liability corporation called APOG [spelled phonetically], AP1000 owners group. The utilities who haveed selected the AP1000 design are all members of that APOG group. They have a variety of meetings, they have an executive committee, they have subcommittees. In fact, I think there may be a committee meeting this week. So we intend to maintain our standardization to the extent that we can through that process. In addition, we intend to, during the construction phase, look at operating experience from each other's sites, as well as from overseas sites so we intend to stay together, if you will, through that process.

CHAIRMAN JACZKO: Thank you. Commissioner Svinicki.

COMMISSIONER SVINICKI: Thank you for your overview presentations. I'll, of course, reserve my more detailed questions for the safety and environmental panels, but as an overview, or as general questions I would ask the following. On your slide eleven, you list or highlight three NRC guidance documents that were used in preparing the license application, could someone please give a general evaluation of the quality and specificity of NRC guidance that you utilized and anything that you would suggest cold be -- any issues with clarity that you encountered or just give your general assessment of the utility of the NRC guidance. Was it clear to you, was it something that was subject to interpretation, did it pose any challenges in its scrutability?

AMY MONROE: Yes, I go and start with that. As far as Reg. Guide 1.206 goes, we were active in the initial workings -- developing

that document, there were multiple industry, public meetings of which we were a part of and worked with the staff to help start us off on the right foot and improve clarity from the beginning. I believe we've learned some lessons over the course of time and as we try to write and implement the applications, but in general I think the guidance has been reasonably well-written and the interpretations that we did need to make, in communications with the staff were able to produce the desired benefit -- the desired outcome.

COMMISSIONER SVINICKI: In those instances where you did have to work to interpret or understand would you characterize those as more specific to your own application or were they general issues of just the level of understandability of the guidance itself, or were the clarifications specific to your application of the guidance?

AMY MONROE: I think in general they were more general in nature, many of the issues got worked out at an industry level, in cooperation with NEI and the design centered working groups and the ones that were a little more specific to the design.

STEPHEN BYRNE: I will add that for the last four years I've been the chair of the New Plant working group. We have not always seen eye to eye with staff. Where issues have come up, particularly where clarification would be needed, things like changes during construction, security fitness for duty, access during construction, those kinds of things. I think we've worked with the staff, largely through NEI in a public process in order to reach consensus on a way forward and I think process has been very successful for us so far.

COMMISSIONER SVINICKI: Okay, and that's an important distinction, maybe this is akin to the Chairman's comment about ITAAC, I'm not so much asking a question, necessarily, about universal agreement, it's more scutability and understandability that we understand what's meant and I think you've responded to that in your answer. On your slide 20, there's many key interfaces, of again this mandatory hearing is of course about the regulatory findings the NRC must make, but you highlighted the applicant's need for many other permitting and other interactions you had at the state level. Were there any cases of impinging jurisdiction or perhaps even overlapping jurisdiction or requirements that needed to be de-conflicted between various agencies, of course my specific interest is in NRC, but I'm also interested generally if there was anything that -- and actually I don't like the word de-conflicted but I'll use it because it's the only term I can think of. How did you resolve any of those issues if they arose?

APRIL RICE: I would say that there weren't any major conflicts or disconnects between the requirements of the agencies, in fact in the analyses that we did for the environmental report have served us well in the permits for the core permits, for instance, the FERC license amendment, the NPDS permit, we've been able to use, for instance, the core mix analysis to look at the discharge into the Par reservoir, that same analysis has served us well with all the agencies. So while some may need a little more detail in one area or another I don't think there's any conflict.

COMMISSIONER SVINICKI: So I understand your response to be

that there weren't any issues that fundamentally were not -- you could not reconcile between the requirements of one agency and another. And I would ask the follow-up, do you foresee or are you aware of any major issues with other permits that you've yet to receive?

APRIL RICE: We are not. We are working through the routine comment resolution, but we do not have any concerns at this time.

COMMISSIONER SVINICKI: And perhaps just asking a bit different form regarding your role as the first subsequent COLA, is there anything that you would offer as a general lesson learned for other subsequent applicants in the future or an area that you would highlight for the commission's attention immediately or in the near term?

MALE SPEAKER: I think one that comes to mind is the working with the Army Corps of Engineers as the coordinating agency. We did find out later in the process that their requirements for deciding on the transmission lines and their responsibilities to protect the wetlands [spelled phonetically] did bring into play some additional submittals that we had to put together. So I think working earlier with the Corps in this particular example would have made the process a little more efficient.

COMMISSIONER SVINICKI: Okay, thank you. Thank you, Mr. Chairman.

CHAIRMAN JACZKO: Commissioner Apostolakis?

COMMISSIONER APOSTOLAKIS: Thank you. On slides 8 and 9 -- or 9 -- you have a module assembly building. Would you please tell me

what will be assembled there?

STEPHEN BYRNE: In the module assembly building are going to be the large modules, the first of which should be a module called CA-20 [spelled phonetically]. That is basically a large part of the auxiliary building which also encompasses the spent fuel pool. CA-01 should also be built at the same time inside that module assembly building. CA-01 will encompass the areas that will surround the steam generators, the pressurizer and the reactor vessel. That building actually was a lesson learned from China where they built their modules outdoors. They built them horizontally. Their advice to us was if you can do it indoors, you would lose less time to weather, and then the uprighting process puts a lot of stress and strain on those modules, these bolts, bolts and connections and wells that you just made. So if you can start in the vertical position, roll them out of the building and then pick them with the large crane, you'd be much further ahead. So that's why we built the module assembly building.

COMMISSIONER APOSTOLAKIS: Thank you. And on slide 12, you say that five of these parts contain program information that is essentially identical to the reference COLA. What does "essentially identical" mean?

Amy Monroe:

"Essentially identical" means basically the only changes we made from the reference COLA were those that make it site-specific in order basically just to change the name from Vogtle to V.C. Summer. The technical content of the programs description remained identical. And

all we did was make it such that it referenced our specific units.

COMMISSIONER APOSTOLAKIS: Thank you. Back to you, Mr. Chairman.

CHAIRMAN JACZKO: Commissioner Magwood?

COMMISSIONER MAGWOOD: Good morning. Well, first of all, I still consider this to be historic.

[laughter]

The -- you know, it often goes unnoticed by most people, but the State of South Carolina has actually over the years been sort of a center point of nuclear technology and expertise for many years, not just with the commercial nuclear capabilities, but certainly with Savannah River site, which of course I'm familiar with from my DOE background, the University of South Carolina with its graduate program, South Carolina State with its undergraduate program, [unintelligible] site. There's a lot of -- there's Westinghouse, fuel fabrications, a lot of expertise there, so it's somewhat natural that you would be here today as one of the very first applicants for the Commission to review to build a new client. And -- now that you've gone through this first part of the process, I wonder if you have any generic observations about how this licensing process has been. I know some of you because I've visited your site some time ago, you still have a lot of people who were around the last time you went through this. I just wondered if you had any general observations at this point about how well this process works and maybe compare it to what we did before.

STEPHEN BYRNE: Well, let me lead off and let the rest of the

panel fill in afterwards, but whether you're going through a Part 50 license process or a Part 52 license process, it helps to have some of the folks who were around for the previous round of construction. We have been blessed with about a dozen folks who are in our new nuclear deployment group that came from Unit 1 that had operating experience and construction experience at Unit 1, including our vice president for new nuclear deployment. That, for us, has been just a tremendous advantage. Another huge plus, and this may sound funny, but the economy has actually worked in our favor. One of the things we were concerned about up front was the availability of the workforce, the operating workforce and construction workforce. When it looked like there might be 10 or 12 plants being built all at the same time, many of which would be in the Southeast, that looked to be problematic. With the downturn in the economy, only two of constructing, we now have ample workforce. Also very fortunate that some of the institutions that you mentioned, along with some of the community colleges in our state have viewed this as a crisis of opportunity, helping us significantly with the training of that workforce. So we were able to get engineers, as you point out, from places like South Carolina State, for instance, Francis Marion, University of South Carolina. And we're also able to get technicians from places like Midlands Technical College and the other technical colleges in the state technical college system. So if I were to advise somebody going forward, I would say that you need to cultivate those relationships with your in-state institutions early. We actually have an operator training program now through the local technical college,

anticipating that the Navy will not be able to supply operators for the foreseeable future, potentially another 60 years of this plant. We think those kinds of relationships are very important.

ALFRED PAGLIA: And I'd also commented as I mentioned in the presentation that the design-centered working group approach we think is very efficient, you know, working collaboratively with New Start worked very well for us. And obviously the one issue-one review process is very efficient all involved, so we had a positive experience -- challenging but positive.

COMMISSIONER MAGWOOD: I appreciate that. You know, I'm sure that back in March when you woke up to the news about Fukushima and I'm sure those of you who were moving forward to working on this project probably thought, "Oh no. Now what?" And, you know, the Commission's obviously spent a lot of time on Fukushima-related issues over the last several months. And just yesterday, we had a lengthy briefing from the staff and hearing from some outside parties about some of the proposed actions that we might take. And I think without getting too far from the processes, I think it seems to be quite clear that the Commission's likely to do something in the areas such as station blackout and areas like that. And I'm sure you've been watching this very closely.

And I want just to get your observations about this. When you think about the changes that might be on the offing, what in your view is the appropriate way for us to engage your project since you're sort of midstream in the middle of all of this. And have you thought through that? And what part of what might change might have the largest

impact on your project?

STEPHEN BYRNE: Well, you know, my response to Fukushima is something very similar to "Oh no." The impacts to both our operating fleet, our new nuclear fleet, even though that's a fleet of, we hope, two for the foreseeable future, could be significant -- you know, our urging would be that we make common sense changes and not do what we did with TMI which was put out a lot of changes, many of which we rescinded in the subsequent years, and then make the changes consistent with their importance to safety. Obviously we can't do everything all at one time. The level of distraction for both our construction and our operating fleet would be significant, and that might be an unintended consequence of trying to make the plant safer or perceived to be safer. We did enter the Fukushima issue into our corrective action program for our new nuclear units. Our evaluation did not show any immediate modifications that would be needed in the plant. That is consistent with what Westinghouse has found. So the AP1000 units are perhaps not uniquely, but one of the few units that rely on half the safety features and were designed for coping with station blackout for an extended period of time. So in the short term, we don't see any need to make design changes to the plant. Now, changes to how you handle things like spent nuclear fuel, emergency planning, now we would see those evolving over time and we would make those changes consistent with the change that we'd make to our operating units, so we're all at one site, all encompassed in one emergency plan so we would look to see that we make those changes at the same time. Obviously once we get a license for it,

we would come under the same rules and regulations that our operating plant would have to comply with.

COMMISSIONER MAGWOOD: Thank you very much.

CHAIRMAN JACZKO: Commissioner Ostendorff?

COMMISSIONER OSTENDORFF: Thank you. I have a few questions and then I'll ask -- you can sort out who wants to respond to these. I want to kind of continue on with Commissioner Magwood's discussion about the Part 52 process. It certainly started out with Bellefonte as being the initial plant, then shifted over to Vogtle, and the reference by the AP1000 design certification process. From where you sit as the applicants, did that process with yours being a subsequent COL, did that kind of match what you thought your expectations were going into it as far as any efficiencies, any challenges, any surprises?

STEPHEN BYRNE: Yeah, from a metric scale, I'll say it did match our level of expectation. And when we made the decision to pursue new nuclear and we joined New Start, we were probably the sixth or seventh utility to join New Start. There were a number of other folks that had made the decision to build AP1000 before we did. The fact that we are here as the second client and with the original reference plant dropped off is not something that we would have foreseen up front. But being a subsequent call was always something that we had in mind. So, from that respect, we think the process has worked well.

Fortunately, we worked very well with the folks from Southern. And when it became obvious that Bellefonte was not going to be the reference COLA any longer, we did have some discussions with the folks at Southern

and because of the -- where they were in the process, where we were in the process, the fact that they already had the ESP, it seemed to make more sense for them to be the reference COLA and for us to be the subsequent COLA. So from my perspective, the processes worked about the way that we thought it would work. And we always had anticipated being a subsequent COLA.

COMMISSIONER OSTENDORFF: Okay, let me follow on that line just with a follow-up question. One of you mentioned your design-centered working group and you talked about your New Start group. In the area of differing professional opinions, I'm sure you had some issues that came up, that there were different judgments about what should happen from the engineering side or an environmental side. Were there any -- can you describe for us overall your processes to how any differing professional opinions were resolved within the design-centered working group?

STEPHEN BYRNE: Well, if it -- from our perspective at the APOG level -- this is the AP1000 owner's group -- we have an executive committee which has a structure, so differences in the subcommittees would be raised to that executive committee and we would get them resolved at that level. We have had some differences, and there are some places where Southern and SCANA are willing to go forward with something whereas some of the other APOG members might not be. In that case, you know, we would have to make a decision first, obviously because we're going to get licenses, and the other utilities were not looking to construct as early as we were going to construct. But there

is a process for raising issues, vetting those issues, and then having the executive committee make a decision on those issues.

COMMISSIONER OSTENDORFF: Okay. Thank you. Let me shift. I believe my -- April, I think this question's probably yours. Your slide 20, Commissioner Svinicki had talked about the key agency interfaces, and you already have some permits, some are, you know, to be resolved at some point in the near future. Can you talk a little bit about how -- for those permits that are not yet approved, how does your organization plan to inform NRC staff about any new information or any significant information that might arise in the environmental area and you already have some permits?

APRIL RICE: I have had discussions with our environmental project manager. We would plan to submit any additional changes or new information to the NRC by formal correspondence, probably preceded by some discussions about that information. To date, there has not been an instance where we've had to do that. Because the Corps and the NRC cooperated together on the FEIS, any information differences that the Corps needed were included and provided to the NRC.

COMMISSIONER OSTENDORFF: Were -- have you come across any significant differences in approaches between any of your state agencies and any of the federal agencies that you're working with?

APRIL RICE: No, not really. We tried to use analytical methods in the ER that would be supported for the state permits. We did have early discussions with the Department of Health and Environmental Control, the Department of Natural Resources, to make sure that the

analyses we were using would meet their requirements too. In one instance I mentioned with the CORMIX model, the state did ask us to use a later version, and we provided those results to the NRC staff for their review. And that was prior to the FEIS.

COMMISSIONER OSTENDORFF: Okay, thank you. Thank you, Mr. Chairman.

CHAIRMAN JACZKO: Well, thank you very much for you answers and your presentation. And I'll have the staff come and give their presentation.

As we begin, if you could, again, please state your name and your title for the record.

MICHAEL JOHNSON: Good morning, Chairman and commissioners. I'm Michael Johnson, director of the Office of New Reactors.

FRANK AKSTULEWICZ: Frank Akstulewicz, deputy director of Division of New Reactor Licensing, Office of New Reactors.

SCOTT FLANDERS: Scott Flanders, director of the Division of Site Environmental Reviews in the Office of New Reactors.

MICHAEL JOHNSON: Good morning. It's my pleasure to address the Commission in this public hearing today. Before I turn the discussion over to Frankie Akstulewicz and to Scott Flanders to provide an overview, I'd like to take the opportunity to provide a few brief introductory remarks. The Summer COL review is the second combined license review complete by the staff where the staff has conducted both a safety review and an environmental review and has proceeded to the mandatory hearing phase of the licensing process. This is a major

milestone and a significant accomplishment by the staff. The staff completed its review of the Summer combine license application in August of 2011. That review began the first half of 2008 when the applicant submitted its initial version of the application. Since then, the staff has expended approximately $25,000 on the safety review, $15,000 on the environmental review, which involved well over 100 staff, engineers, scientists and technical specialists. The applicant responded to over 900 staff questions is our count, including 260 questions associated with the environmental review, 650 questions associated with the safety review. In addition, the staff considered more than 700 environmental scoping comments and over 250 comments on the draft environmental impact statement. Contractors working under staff direction provided additional effort, totaling approximately 17,000 hours in support of the environmental and safety reviews. The Summer application incorporates by reference the AP1000 design certification. While completing its review of the Summer application, the staff performed in parallel its review of an amendment to the AP1000 design. The staff expended approximately 52,000 hours in completing the AP1000 design certification review.

The Office of New Reactors led the effort and provided most of the staff expertise in the review. However, other NRC offices provided significant expertise. The Office of Nuclear Security and Incident Response conducted evaluations related to security and emergency preparedness. The Office of Nuclear Reactor Regulation provided support in the resolution of some safety issues and in the

financial review area. The Office of Nuclear Materials Safety and Safeguards, the Office of Federal and State Materials and Environmental Management Programs in Region 1 provided support of Part 30, 40, and 70 license reviews. And Region 2 supported various environmental meetings and safety audits in the community around the Summer site and on the Summer site itself. The Department of Homeland Security, the Federal Emergency Management Agency, the U.S. Army Corps of Engineers also contributed to NRC evaluations.

Before starting the overview presentation, I'd like to discuss the impacts of the Fukushima Daiichi Nuclear Power Plant event on this review. In the staff's statement, in support of the Summer COL hearing, documented in SECY 110115, the staff noted that the commission has options associated with how to address the Fukushima lessons learned in the decision to proceed with new reactor licensing. The staff noted that the Fukushima task force contained three specific recommendations for near-term COL applications: to confirm station blackout and spent fuel pool capabilities associated with the AP1000 design; to enhance on-site emergency response capability through the integration of emergency operating procedures, severe accident management guidelines, and extensive damage mitigation guidelines; and to enhance emergency planning to address prolonged station blackout in multi-unit accidents. The staff's statement in support of the Summer COL hearing noted that the commission could choose to adopt some or all of these recommendations and to implement them in COLs through license conditions. Alternatively, the commission could issue COLs and later

modify, add, delete any terms or conditions of the COL to reflect the commission's requirements in accordance with the applicable regulatory provisions. Since issuance of the staff's statements supported the Summer COL hearing, the staff issued SECY 110137 dated October 3, 2011 on prioritization of the recommended actions to be taken in response to the Fukushima lessons learned. The Commission had a meeting on this issue that referenced the paper yesterday. The Fukushima prioritization commission paper discusses new reactor designs and near-term combined license reviews and references the staff's statement in support of the Summer COL hearing. I believe the options provided to the Commission in the staff's statement are still valid, and the Commission could seek to impose new requirements before the license is issued or impose new requirement associated with lessons learned from the Fukushima event after issuance of the COLs in accordance with the appropriate regulatory process. Next slide, slide 2 please.

This slide provides an overview of the presentations that Frank and Scott will be making. Frank will provide an overview of the staff's safety review, including the findings that the staff believes can be made. Scott will then provide an overview of the staff's environmental review and the findings associated with this review. Scott will also provide a discussion of the staff's presentation over the next two days.

In closing, I'd like to note that the staff has found that the final safety evaluation report and the final environmental impact statement and the staff's statement of support at the hearing provide an

adequate basis for the meeting -- for meeting the necessary regulatory findings. I'll now turn the presentation over to Frank.

FRANK AKSTULEWICZ: Thank you, Michael. Good morning, Mr. Chairman and Commissioners. I am the deputy director of the Division of New Reactor Licensing in the Office of New Reactors. On March 27, 2008, South Carolina Electric and Gas, acting on behalf of itself and as an agent for the South Carolina Public Service Authority submitted its application for a combined license application for Summer Units 2 and 3. The Summer application was the fourth combined license application submitted that referenced the AP1000 design. After an acceptance review by the staff, the application was docketed on July 31, 2008.

The Summer combined license application incorporates by reference the AP1000 design certification and the AP1000 design certification amendment, revision 19. Based on the finality that NRC regulations afford to a certified design referenced in a combined license application, the scope of this application review is more focused than a review of a combined license application that did not reference a certified design. What that means is that it was unnecessary to review the items that were resolved within the scope of the certified design. Rather, the combined license review focused on aspects of the application, such as site characteristics, emergency planning information, combined license information items, design information that replaced conceptual design information from the design certification, and the programmatic elements that are the responsibility of the combined license applicant. During its evaluation of the Summer

application, the staff confirmed that the complete set of information required to be addressed in the application was submitted. Following this confirmation, the staff review of the COL application was limited to the COL-specific review items. The staff's review of the AP1000 design certification and its amendment is reflected in NUREG 1793 and its supplements. Next slide please.

In addition to incorporating by reference, the AP1000 design certification, the Summer combined license application also consists of sections that are standard for all COL applicants in the AP1000 design center and sections that are site-specific, and thus only apply to the Summer Units 2 and 3. The applicant has identified the standard content material in its final safety analysis report by the use of left margin annotations. For example, a left margin annotation that began with STD-COL reflects FSAR information that addresses a design certification combine license reference information that is common to all applicants. Similarly, a left margin annotation of STD-SUP relates to FSAR information that supplements information in the design cert and is common to other COL applicants. Use of the design-centered review approach for the standard content evaluation is summarized in the staff's safety evaluation in section 1.2.3. The design-centered review approach is described in regulatory issue summary 2006-006 and was endorsed by the Commission's staff requirements memorandum associated with SECY-06-0187, dated November 16, 2006. The design-centered review approach was used in the staff's review of several portions of the application including the final safety analysis report, the quality

assurance plan, the cyber security plan, and mitigative strategies document for the loss of large areas of the plant due to fires or explosions.

In its safety evaluation, the staff references these left margin annotations in its evaluations. When standard content evaluations are found to be applicable to Summer, the staff identifies these evaluations using double-indented, italicized text. Because the AP1000 reference combined license application changed from Bellefonte to Vogtle, this double-italicized text includes both Vogtle and Bellefonte safety evaluation material. The Vogtle material reflects the closure of the standard content open items which was performed after the transition to Vogtle as the reference combined application.

The Summer COL application also consists of site-specific information. The majority of the site-specific information can be found in Chapter 2 of this applicant's final safety analysis report and in its emergency plan. The staff's evaluation of this material can be found in Safety Evaluation Report, Chapters 2 and Section 13.3 respectively. Next slide please.

The slides on pages 5 and 6 provide a high-level overview of the 18 parts of the Summer Units 2 and 3 combined license application. The table on these two pages describes where the staff's evaluation of each part of the combined license application appears within its final safety evaluation report or its final environmental impact statement. For example, the staff's review of the applicant's emergency plan, which is listed as Part 5 by the application, can be found in Final Safety

Evaluation Report, Section 13.3. Next slide, please.

Parts 11 and 12 of the combined -- I'm sorry. Parts 11 and 12 of the Summer combined license application contain site-specific information related to the geotechnical review, and the staff's evaluation of this information can be found in Section 2.5 of the Final Safety Evaluation Report. Parts 13 through 18 of the combined license application were evaluated using the design-centered review approach, and their reviews are documented in the evaluation sections provided in the right-hand column of this table. Next slide, please.

In addition to the review performed by the staff, the Summer combined license application was referred to the Advisory Committee on Reactor Safeguards in accordance with 10CFR 52.87. The applicant and the staff supported two AP1000 ACRS subcommittee meetings in July of 2010 and January of 2011. In addition, the applicant and the staff supported an ACRS full committee meeting on February 10, 2011. The ACRS provided its reported related to the Summer application on February 17, 2011. The ACRS report concluded that there is reasonable assurance that the V.C. Summer Units 2 and 3 can be built and operated without undue risk to the health and safety of the public. The ACRS also stated that the V.C. Summer application for Units 2 and 3 should be improved following its final revision. The ACRS report also included recommendations associated with its review of the Vogtle application, that they determined were also applicable to the Summer application. These included a discussion of a containment interior debris limitations, in-service inspection and testing program requirements for

squib valves, measurement uncertainty and the subsequent changes of the design certification and Vogtle FSAR.

The first three recommendations were discussed during the Vogtle mandatory hearing, and the staff does not intend to present any further information relating to them. Regarding the last recommendation, there are no changes -- excuse me -- there were no changes to the Summer COL application other than to close confirmatory items after the full committee meeting ACRS. Therefore, the staff did not have to report back to the ACRS on this particular recommendation.

In addition to these recommendations, the ACRS report also included a recommendation associated with the use of the habited [spelled phonetically] computer code for toxic gas evaluations. The staff intends to discuss more about the use of the habited computer code in the safety evaluation report panel 3 later. The staff's response to the ACRS, February 17th report, can be found in the letter dated March 26th, 2011. The staff issued the final safety evaluation report for the Summer application on August 17th, 2011. Next slide, please.

In order to issue a combined license, the Commission must be able to conclude that each of the findings on this slide are met. In his testimony to support this hearing found in SECY-11-0115, the staff summarized the bases that would support the commission's determination that the staff's review had been adequate to support the findings set forth in 10 CFR 52.97 and 10 CFR 51.107. The SECY paper provides an overview of the findings that's subject to final certification by rulemaking of the amended AP1000 design, can be made to support the

issuance of the Summer Unit's 2 and 3 combined licenses.

Slide eight summarizes these findings. I will review each finding in the staff space is supporting that the finding can be made. First, the applicable standards and requirements of the act and the Commission's regulations have been met. The staff reviewed the application and evaluated it against the applicable requirements in 10 CFR Parts 20, 26, 30, 31, 32, 40, 50, 51, 52, 55, 70, 73, 74, 100, and 140. Based on the staff's review, documented in its final safety evaluation report and final impact statement, the conclusions of the ACRS, the staff concludes that for purposes of issuing combined licenses for the VC Summer Unit's 2 and 3, the applicable standards and requirements of the Atomic Energy Act of 1954, as amended, and the Commission's regulations have been met.

Second, any required notification of other agencies or bodies have been duly made. As documented in the SECY paper, the staff believes that all required notifications, including those to the Public Service Commission of South Carolina, as well as the required federal register notices, have been made.

Third, there is reasonable assurance that the facility will be constructed and operated in conformity with the licenses, the provisions of the act and the Commission's regulations. As documented again in SECY-11-0115, the staff believes that the staff review, as documented in its final safety evaluation, in combination with ITAAC and license conditions contained in the combined licenses, provide the necessary assurance that the plants will be constructed and operated as

required.

Fourth, the applicant is financially and technically qualified to engage in the activities authorized. The technical and financial qualifications of the applicant are summarized in the SECY paper and documented in the staff's final safety evaluation. Some additional details will be discussed later during this mandatory hearing in safety evaluation report panel one.

Fifth, the issuance of the licenses will not be animicable to the common defense and security or to the public health and safety. Based on the staff's review of the application, as documented in its final safety evaluation, the staff concludes that issuance of combined licenses for the VC Summer Units will not be animicable to the common defense and security or to the public health and safety.

I'll now turn the balance of the overview presentation over to Scott.

SCOTT FLANDERS: Thank you, Frank. Good morning, Mr. Chairman, commissioners. As Mike indicated earlier, I am the director of the Division of Site Environmental Reviews, and I will be discussing the environmental review.

So, staff prepared an environmental impact statement, or EIS, for their Summer Units 2 and 3 combined license application in accordance with the National Environmental Policy Act of 1969, and the requirements of 10 CFR Part 51. The staff prepared the EIS based on its independent assessment of the information provided by the applicant and information developed independently by the staff, including the

information gathered through consultations with other agencies.

The U.S. Army Corps of Engineers Charleston District fully participated with the staff in preparing the Summer EIS as a cooperating agency. Under the terms of an updated memorandum of understanding between NRC and the core for the review of nuclear power plant applications. This MLU was signed in September 2008.

As a member of the Environmental Review Team, the Corps staff participated in site visits, consultations with other agencies, and the development of the draft EIS and final EIS. I would like to note that Dr. Richard Dardenne [phonetic] from the Corps' Charleston District is with us today, and we thank him for his assistance throughout this process.

The MMC began the environmental review process for their Summer combined license application by publishing a notice of intent to prepare an EIS and conduct scoping in the federal register on January 5th, 2009. Two scoping meetings were held to obtain public input on the scope of the environmental review. The first meeting was held in Winnsboro, South Carolina, on January 27th, 2009. The second meeting was held in Blair, South Carolina, on January 28th, 2009. The staff also held an additional public outreach meeting in Blair, South Carolina, on March 28th, 2009. Staff reviewed the comments received during the scoping process, and responses were developed for each substantive comment. These responses were documented in a scoping summary report, and, also, provide an Appendix D of the final EIS. The staff contacted federal, state, and local agencies and tribes during the

scoping period to solicit comments, and it considered these comments in preparing the draft EIS. The staff also consulted with the U.S. Fish and Wildlife Service, National Marine Fisheries, Federally Recognized Indian Tribes, the South Carolina State Historic Preservation Officer, and other agencies, as required by the Endangered Species Act, National Historic Preservation Act, and other statutes. Next slide, please.

A 75 day comment period for the draft EIS began April 26th, 2010, the date of publication of the U.S. Environmental Protection Agency notice of availability. The staff held two public meetings on May 27th, 2010, near Jenkinsville, South Carolina, to describe the results of the staff's environmental review, provide members of the public with information to assist them in formulating comments on the draft EIS, and to respond to questions and accept comments. The staff developed responses to comments received on the draft EIS and provided these responses in Appendix E of the final EIS.

On April 22nd, 2011, the staff published the final EIS, NUREG 1939. As stated in the final EIS, the staff recommendation related to the environmental aspects for the proposed action is that the COL's should be issued. The staff basis recommendation on the Summer COL application environmental report consultation with federal, state, tribal, and local agencies, the staff's own independent review, staff's considerations of comments related to the environmental review that were received when the public scoping process, and the staff's consideration of comments on the draft EIS, as well as the staff's assessment summarizing the EIS, including the potential mitigation measures

identified in the environmental report and in the EIS. Can I have the next slide, please?

This slide lists the environmental findings pursuant to 10 CFR 51.107a, that the commission must make to support the issuance of the COL's. The staff believes that the scope of the environmental review, the methods used to conduct the review, and the conclusions reached in the EIS are sufficient to support a positive determination regarding these findings. For the first finding, and according to NEPA Section 1022.a, the staff's environmental review used a systematic interdisciplinary approach to integrate information from many fields, including the natural and social sciences, as well as environmental [unintelligible]. The staff's review comports with NRC requirements in Appendix A to 10 CFR Part 51, format for presentation of material and environmental impact statements. The staff concludes that the environmental findings in the EIS constitute the hard work required by NEPA and have regional support in logic and fact. The established process for developing EIS will be discussed further in a separate panel as a part of this mandatory hearing.

In accordance with NEPA Section 1022.c, the EIS addresses the environmental impacts of the proposed action and the unavoidable adverse effects. Alternatives to the proposed action, the relationships between local, short-term uses of the environment, and the maintenance and enhancement of long-term productivity and irreversible and irretrievable commitments of resources that would be involved in the proposed action should it be implemented.

As supported by correspondence presented in Appendix F to the EIS, the staff concludes that it fulfilled the requirement of NEPA Section 1022.c by consulting with and obtaining comments from other federal agencies with jurisdiction by law or special expertise. As noted earlier, the U.S. Army Corps of Engineers fully participated in preparing the EIS as a cooperating agency. The staff did not identify any other federal agencies as cooperating agencies in preparing the EIS.

In accordance with NEPA Section 1022.e, the staff concludes that the EIS demonstrates the staff adequately considered alternatives to the proposed action. The alternatives considered in the EIS include the no-action alternative, site alternatives, energy alternatives, system design alternatives, and mitigational alternatives for severe accidents.

For the second and third findings in Chapter 10, for the second and third findings, Chapter 10 of the EIS provides a staff cost/benefit assessment, which considers, among other things, the need for power as well as reasonable alternatives to the proposed action. Based on that analysis, the staff concluded that construction and operation with the proposed Summer Units 2 and 3 would have accrued benefits that would be expected to outweigh the economic, environmental, and social costs. As a result, the staff recommends that the COLs be issued.

For the fourth finding, the staff believes that the Commission will be able to find after this hearing that the weekly review performed by the staff has been adequate. As will be discussed

in more detail in later presentations, the staff performed a thorough and complete environmental review, sufficient to meet the requirements of NEPA and adequate to inform the Commission's action on the COL request. Can I have the next slide, please?

Over the next two days, the staff will be presenting information on the issues listed on this table. The staff's presentations will include the unique and novel issues identified in SECY 11-0115. In addition, staff will present the information that was identified in the agenda for this mandatory hearing, which includes highlights of the staff's evaluations from the final safety evaluation report and the final EIS.

During the safety review panels, the staff does not intend to discuss information that is incorporated by reference or that is standard content to the Vogtle application. The staff presented this information during the Vogtle mandatory hearing. The staff is, however, prepared to answer questions in these areas.

Today, we will be presenting information for SER panels one, two, and three. SER panel one includes staff's presentation on the unique and novel issues associated with the Summer wet bulb temperature exemption evaluation and highlights from Chapters One and Sections 2.1 and 2.2 of the staff's final safety evaluation report.

The SER panel two includes highlights of the staff's evaluation found in Chapter Two of the final safety evaluation report related to hydrology, geology, seismology, and geotechnical engineering. The staff will also present highlights from Chapters Three and Nineteen

of the final safety evaluation report, related to ground motion response spectra, the seismic margins analysis, and external net frequencies

The SER panel three discussions includes highlights from the staff safety evaluation found in Section 13.3 of the final safety evaluation report related to emergency planning. This discussion will include the unique and novel issues identified in SECY 11-0115, related to the size of the emergency planning zone. This panel discussion will also include a discussion of the ACRS recommendation associated with the use of the HABIT [spelled phonetically] computer code and the ACRS observation related to the monitoring for radioactive leakage from the waste-water discharge line. Can I have the next slide, please?

Tomorrow, the staff will present an overview of the final environmental impact statement EIS panel one will provide a summary of the process for developing EIS, the assessment of environmental impacts, all analysis of alternatives, included as recommendations in the FEIS.

In the second EIS panel, the staff will present the two unique and novel issues described in SECY 11-0115 associated with environmental justice and interactions for the U.S. Army Corps of Engineers.

This ends our presentation on the overview of the Summer COL application. On behalf of the staff, we look forward to the coming presentations. I hope, based on your review of the final safety evaluation report and the final EIS and the staff's presentations that you will come to the same conclusions that I have, which is that the staff's reviews were performed in a high-quality manner, are well

documented, and support the findings that the commission needs to make in order to issue the combined license for Summer Units 2 and 3. Thank you.

CHAIRMAN JACZKO: That concludes the status presentation. Thank you. I want to turn to the issue of the Fukushima response In the staff paper and, Mike, I think in your presentation you talked about that there are basically two options in as how to proceed, and we could impose some kind of requirement now or we could wait and follow more the way we do with the operating reactors. If the Commission were to choose to go forward with the option of some type of action now, be it a license condition, ITAAC, or something, I think the task force recommended an ITAAC or ITAAC to be a number of ITAAC to be applied. I think the staff has talked about a license condition. Would you be able to provide those modifications by, let's say, December if the Commission requested that as part of the mandatory hearing?

MICHAEL JOHNSON: Chairman, we haven't begun to think about what that license, what a license condition, for example, could look like that would capture recommendations, that the Commission would choose to go forward with. We're working internally and also with AGC to structure those and to a license condition. There are a range of options that the Commission could choose in terms of what that license condition, for example, those license conditions could look like. And, in fact, we have a post Vogtle hearing question that touches on that issue that we hope to drive to -- and use to drive to a line with respect to what we can offer to the Commission with respect to that.

Once the decision has been made about what the changes need to be we think that actually creating a license condition could be a relatively straight-forward activity, and so we're anticipating weeks to do that. So, I think that comports with your December-ish time frame

CHAIRMAN JACZKO: Okay. And I did put in the post Vogtle hearing question, so that's, I'm very interested in that. The -- and it will be applicable, I think, somehow. I mean, if we need to duplicate that, I don't know if we need to, because if we need to duplicate that question here to get it formally on the record or have it submitted to both records so we have it in both hearings. So, if you could do that.

The -- one area in which I'm a little bit confused, and I have to admit, the -- in response to a prehearing question on Summer, the staff did indicate a preference. In your testimony, you appeared to indicate no preference as to which of the options. Do you know which is the right answer?

FRANK AKSTULEWICZ: Yeah. I think what we, in response to the question, what we said is that it would be easier to do the license condition before issuing the license. That was the only delta discussion that we had with respect to the options. But, we did not, I believe, state a particular preference to move forward one way or the other.

MICHAEL JOHNSON: Sorry. I don't mean to continually maintain that [phonetic]. I don't believe we have a preference. I think, with respect to, I think the nature of the question was is it easier, as Frank indicated, are there, is it easier from a requirements

perspective doing a pre or post, and so we've answered that question. But, again, we can respond to however the Commission directs us.

CHAIRMAN JACZKO: Well, I, and, somehow, I think we need to clarify what is in and perhaps I'm misreading what states here, but this was response to question 1A. It says the staff recommends proceeding with issuance of the license and using the appropriate regulatory tools to impose new requirements in the event new requirements are established. So, I guess what I'm hearing is that, and unless I have the wrong document, what I'm hearing is that, unless maybe I'm misinterpreting what that says, but that reads to me as proceed now and deal with it after the fact.

MICHAEL JOHNSON: Yeah. Yeah. We'll clarify the answer, chairman. My answer is we don't have a preference. The staff can react to whatever direction we get from the Commission moving forward.

CHAIRMAN JACZKO: Okay. Thank you. Appreciate that. Scott, if I could turn to you for a minute, and this is at a -- by the way, did we do nine minutes for each of these, or is this still six? Okay. The environmental report or the EIS. We use the terms small, medium, and large. And I have a very specific question, and this is on an overview level, and I'll probably get into some specifics tomorrow about this, but in general, when we talk about small, medium, and large impacts, do we mean that the risk is small? And this is how I would think about things that can happen. If low risk, you have low probability or you have low consequence. Is there a generic way that we categorize those things, or does it depend on the specific issue we're looking at?

SCOTT FLANDERS: It's going to depend on the specific resource and impact that we're looking at. So, in some cases, while we're looking at impacts associated with a particular environmental resource or a particular species, we're talking about the environmental impacts or the consequences to the species as a result of the actions that are being taken. In some parts of our --

CHAIRMAN JACZKO: Without regard to –

SCOTT FLANDERS: Without regard to likely –

CHAIRMAN JACZKO: Likelihood.

SCOTT FLANDERS: Right. Because –

CHAIRMAN JACZKO: okay.

SCOTT FLANDERS: --for example, if we're doing construction activities, there's going to be certain construction activities and our actions are going to take, so we know that's going to happen, so we assess what the impacts would be associated with that. When we analyze some of our radiological consequences in, for example, severe accidents, we look at those in terms of a risk. We look at those in terms of the likelihood of the event occurring and the consequences that would result from that. So those, in terms of a risk, and in the environmental risk, in those situations, we characterize whether or not those are small, medium, or large risks. So, to the extent that there is action for which we believe that –

CHAIRMAN JACZKO: By that, I mean, just, I want to just to get to clarify it, so. It's possible that in some areas there may be high consequences, but, because of the low probability, we categorize

that as a small environmental impact. Is that –

SCOTT FLANDERS: In those cases, where we're talking about the environmental risk associated with the activity, yes, that's correct.

CHAIRMAN JACZKO: Okay. Thank you. Commissioner Svinicki?

COMMISSIONER SVINICKI: Well, thank you all for your presentations. And, again, Mike, as I had done in the Vogtle mandatory hearing, I want to congratulate you and all those who supported you and your staff in getting today to this milestone of being present at this mandatory hearing. It's a very impressive and substantial body of work that the staff has undertaken to reach the milestone today. So, I appreciate also that you acknowledge the many other offices other than the Office of New Reactors that are absolutely essential to arriving at the point in staff's review where we find ourselves today.

I also had in front of me the staff's response to the prehearing question, number one, and I want to be certain that I understand. I had actually referred to this. Perhaps I had the same confusion about your opening statement, which adopted more of a neutral stance. But, to be sure I understand, this statement of the staff recommends proceeding with the issuance of the license and using the appropriate regulatory tools to impose new requirements in the event new requirements are established. I understand you now to be indicating that the staff retreats from or will be amending or modifying its recommendation as articulated in this response?

MICHAEL JOHNSON: I think I would say, and, again, we'll look

at the question, the response in terms of the questions that you and the Chairman have raised. I think we were trying to indicate in that question, in the answers to that question that we recommend proceeding with issuance of the license is the emphasis I would put on that sentence. We believe that the process is in place that would enable us to put requirements in place before issuance of the license. There are also processes in place that enable us to put requirements in place after the issuance of the license. And, so, again, I think that the real tone of that question was, or, I response, the staff's response, and our real intent was to say we believe we can move forward with respect to a choice of which, again, my perspective, our perspective is the Commission can choose, we can implement either of those going forward. And we'll clarify the response.

COMMISSIONER SVINICKI: Okay. And I appreciate that. And I'm not a witness giving testimony today, but my interpretation of that response, not to project that onto the staff, was that it reflected the, somewhat intuitively, appealing notion of if the NRC adopts changes in its regulatory response to Fukushima, the agency will be engaged for, frankly, probably some years in enshrining those changes into our regulations. It will be necessary for the agency, of course, to impose those on operating reactors, and I -- into interpreted this statement perhaps to arise from the appealing notion of the, it will be a dynamic landscape perhaps for some time so that having the regulatory tools to impose these and require them is something that the agency will be engaged in for some extended period that will extend, frankly, by my

prognosis, well beyond December. So, but, I look forward -- I also look forward to the staff's response to the post-hearing question and Vogtle, which sounds like you're busy crafting proposals along those lines. And I will, of course, view those objectively and with an open mind when we see a response on that.

Different topic all together, the applicant had indicated that it found value in the fact that their subsequent COLA followed so closely in time the Vogtle activities or the reference COLA. For the staff, from your perspective, were there advantages and also perhaps challenges in the fact that these reviews were so closely coupled in time? And, if so, what were some of the pluses and minuses?

FRANK AKSTULEWICZ: Yes, there were challenges with the fact that the reviews were so coupled and so close in time. Specifically, it was making sure that the documentation was staying current with the progress of the reviews. The fact that the design certification was changing and the applications had to wait for the design certification revisions to be finalized before they could then change their applications to reflect to change in material, which the staff then had to wait to get that information to reflect its revisions into its safety evaluation, created a crush, if you will, of urgency with respect to the receipt of the documents and reviews to get everything organized. It did require a lot of reviews for consistency between the applications to make sure that what was being said in one application was being carried over to another, and then it was also being captured in the staff safety evaluations as the record of the licensing basis agreements. So, it was

a lot of coordination challenges with respect to the three applications.

COMMISSIONER SVINICKI: So, that close coupling required a careful orchestration on the staff's part?

FRANK AKSTULEWICZ: Very much so, yes.

COMMISSIONER SVINICKI: Were there any positives that you would articulate?

FRANK AKSTULEWICZ: I think the benefit, if there is one, was the fact that there was so little variance that SCANA chose to take with respect to its application and the other design center applicants that it simplified that process. If there was substantial number of departures that were unique to the specific application for SCANA, it would have created more of a challenge from that respect. But, the benefit here was that there was so little variance that we could move very quickly from the Vogtle application into the sum, into the SCANA one and then into its completion.

MICHAEL JOHNSON: And just a very quick additional answer to Frank's answer, I think we had tremendous -- gained tremendous benefit from having a reference COL and a subsequent COL closely linked, closely trying to follow issuance of, or completion of a design certification for the AP1000. And then, I think that forced them to be real players in the designs in the working group that made that dialogue, if you will, more effective in terms of us being able to deal with issues, have those issues raised, and dealt with expeditiously. So, I think that was a tremendous benefit, one that I hadn't anticipated going in.

COMMISSIONER SVINICKI: Given that close coupling was the use

or reliance upon contractors for some review assistance, was that in an additional complication? I mean, our, NRC's reliance on contractor support?

FRANK AKSTULEWICZ: I'm not aware of any specific problems or challenges with respect to the use of contractors on these particular reviews. Scott, maybe environmental?

SCOTT FLANDERS: From an environmental standpoint, the coupling of the Vogtle application and Summer application was less of an impact since we're dealing site-specific. And, from a contracting standpoint, there are no real challenges or issues on our end.

COMMISSIONER SVINICKI: Okay. Thank you. Thank you.

CHAIRMAN JACZKO: Commissioner Apostolakis.

COMMISSIONER APOSTOLAKIS: Thank you. Well, I'll come also to question 1A. I must say I join my colleagues here that I understood something different from what you're saying now. But, I have -- maybe you can clarify something for me. The two options, one says impose a license condition now, and the other says don't do that, but, later, if there are new requirements follow the process of the regulatory process to impose the new requirements

MICHAEL JOHNSON: Well --

COMMISSIONER APOSTOLAKIS: What is the difference? I mean, if there is a new requirement, regardless of whether you have a license condition or not, you have to comply with this, right? What would be the real difference?

MICHAEL JOHNSON: In essence, the difference is -- well,

first of all, let me be clear. There are, there's already an AP1000 certified design F-15 [phonetic] that has finality associated with it, and the portions of that are being referenced here. So, there are already finality provisions or back-fitting provisions, if you will, for new requirements coming in.

But, having said that, if you take action now, if the Commission takes action now before the issuance of the license, before the issuance of the license, there -- you don't have to deal with new areas that are getting finality as a result of the issuance of the license. And, so, that's really the essence of the answer when we say it's -- the fewer administrative requirements, if you will, if you do it now than if you do it after the issuance of the license, but that's analogous to what happens for the operating fleet using, with respect to 50-109 back-fitting

COMMISSIONER APOSTOLAKIS: but, in terms of practical consequence, there is no difference, it seems to me. Is there?

MICHAEL JOHNSON: At the end of the day, the requirement --

COMMISSIONER APOSTOLAKIS: I mean, let's say that –

MICHAEL JOHNSON: A requirement is a requirement

COMMISSIONER APOSTOLAKIS: What kind of a license condition could we, could you impose now? For example, that if necessary, this application will have to apply to Recommendation 3.2 of the Fukushima Recommendations?

MICHAEL JOHNSON: That, an option would be to try to craft a very specific license condition associated with a recommendations that

I, you know, integration of SAMG's and EOP, for example.

COMMISSIONER APOSTOLAKIS: Okay.

MICHAEL JOHNSON: You could create a license condition that would try to be specific, anticipating where we would end up today.

COMMISSIONER APOSTOLAKIS: But, if you don't do that, and the Commission decides later that this is something that needs to be done, you'll have to do it anyway, right?

MICHAEL JOHNSON: If the Commission doesn't do it now, and the Commission decides to do it later, then there is, again, the Commission's decision about whether or not to, according to the finality provisions, you've got to apply those tests before those requirements, before you would make those requirements on new reactor licensees, or, again, there are, you know, we've talked. A number of those recommendations are adequate protection recommendations, which, we'd set that aside. But, that's the decision; that's what you avoid in terms of deciding now.

COMMISSIONER APOSTOLAKIS: In terms of what the license or the applicant is going to do eventually, it seems to me there is no difference, unless I'm missing something. You are talking about administrative things that it may be easier to do it now than later, but, I mean, if we want to implement 4.5, everybody will do it.

MICHAEL JOHNSON: If the Commission decides –

COMMISSIONER APOSTOLAKIS: Of course, of course.

MICHAEL JOHNSON: If the commission decides –

COMMISSIONER APOSTOLAKIS: Yeah. Does the applicant have a

comment on this? I mean, is there a difference from your perspective?

STEPHEN BYRNE: Mr. Commissioner, from our perspective, we don't see the need for a license condition now. We think that the requirements on existing operating fleet, once we get a license, will be conveyed upon the licensee once we become a licensee.

COMMISSIONER APOSTOLAKIS: Okay.

STEPHEN BYRNE: SO, we don't see a difference.

COMMISSIONER APOSTOLAKIS: Now, if we impose conditions now, would that entail any delays perhaps in the progress of building the facility?

MICHAEL JOHNSON: Well, I think that goes with the Chairman's questions, how quickly until we get those licensing conditions in front of the Commission so that they are in place at the time, to support issuance of the license on the schedule that we have in mind. And, I think, actually, depending on how specific we are with respect to those license conditions is really the driver with respect to how quickly we could go.

Let me stop there. Again, we do have a post-hearing question that we are going to look at in terms of, and I will answer with respect to what could be done in terms of our license condition? We'll answer that question, and, in fact, if the commissioners would so choose, we can expand that answer to provide a little bit more specificity about ranges of options.

COMMISSIONER APOSTOLAKIS: I understand that, but if you could also -- it's still not clear to me what the big deal is. So if

you could explain it to me, I would appreciate it. Thank you very much. Back to you Mr. Chairman.

CHAIRMAN JACZKO: Commissioner Magwood.

COMMISSIONER MAGWOOD: Thank you. Morning. And let me add my congratulations [unintelligible] I know all the tremendous work that went into doing these two in parallel and I think I always congratulate previous commissions for having the foresight to resource the staff's efficiently to be able to respond to in this manner and I think you've done an excellent job on reacting to the challenge. Let me start my being the horse a little further -- it's still kicking a little bit. I just wanted -- let me just say that you know, the question that was asked was, which of the two options would the staff recommend, be applied to VC Summer Units 2 and 3 combined licenses. And the response the staff gave is the staff recommends proceeding with the issuance of license and using the appropriate regulatory tools [unintelligible] requirements in the event new requirements were established.

And I guess what I would say is that I don't think you can clarify that any further. You can change the answer, but I don't think you can clarify it. Let me just say that. But let me -- you made an offer to do a -- expand the post-hearing explanation a bit. I think it would be really useful to sort of follow up on where Commissioner Apostolokis was going. I'd like to see a good comparison and contrast where you might go with the license condition, where you would go if you wanted -- more in the future and what the impacts on the schedule would be and that sort of thing, what kind of resources. It would be really helpful just

to sort of have that fleshed out for us. I'd like to have that in the post hearing.

I have a question about preoperational testing. It's something I have a little bit of history in it, because you know, a long time ago back in the '90s -- I'm not even sure if you were doing this stuff back in the '90s. The NRC had a significant number of questions -- I think this is back in the AP600 days about the operation passes safety systems and that led to a DOE project -- although it wasn't DOE at the time -- to set up a test rig at Oregon State University to actually test the thermohydraulic behavior or pass the safety systems, and so it's no surprise to me that we have these requirements for first plant testing and first degree or first plant testing to look at -- see these things in full scale operation, and that makes complete sense to me. However, one question I you have is, what's the need for the first three plant test? Can you explain the difference between having to look at this once and having to look at these things three times?

MALE SPEAKER: I'm going to ask Juan Peralta to come to the -

COMMISSIONER MAGWOOD: Thanks.

JUAN PERALTA: Good morning. Juan Peralta, chief Quality and Vendor Branch of New Reactors. I'm a sworn in witness. You're correct, the decision was made back in the [unintelligible] days -- a long time ago. There was a lot of back and forth negotiations on the complexity of the phenomenon, what it would take to really define the phenomenological behavior thermohydraulics. There was extensive tests conducted, in fact, this whole chapter, Chapter 21, on 8600 [spelled

phonetically] devoted to that. The staff's reviews and the diverse extensive test facilities were involved in that [unintelligible] from the applicant's perspective and the NRC's side. In the end, it was a judgment call by the staff. In some cases it's not impressive input. We do [unintelligible] first plan of the test [unintelligible] for example on the [unintelligible] in Part 50. For the first three plants it was based on staff's judgment, on certainty -- level of uncertainty [unintelligible] and our level of knowledge at the time on thermohydraulics behavior and different test facilities.

And again, the objective is really to provide the confidence that we need. I mean if we see [unintelligible] license conditions in place right now, in the proposed licenses. So, if we see a behavior that, it's completely unexpected, then we'll have to think and review and make a decisions then. But the idea was I think, in essence -- and the first plant only was a -- we were much more confident. They expected results would be achieved and the behavior would be confirmed. [unintelligible] less confidence than those based on the different test results and the tests that we have seen in various test facilities. So I mean in essence it was a judgment call.

COMMISSIONER MAGWOOD: Okay, that was a longer answer than -- it was a judgment call, but the answer is that you judge and call that works for me. But let me ask you this question, though, it seems to me that as these plants operate over the course of time, we're going to learn a little bit more as you go, just as we're learning today with plants that are 30 years old. Is there going to be an effort at the

agency to monitor the behavior of these systems over the course of the years of operation to understand how passing safety systems behave or that is just going to be part of NRs normal business? How are you going to approach that?

JUAN PERALTA: From my perspective, that's going to be the normal NRC oversight. There's no plan that I'm aware of where we're going to be monitoring [unintelligible] any different way that what we are at the current rate.

MICHAEL JOHNSON: I think Juan is exactly right. They would join the oversight process, they would join our routine operating experience process, our routine generic communications process, all of that would provide an ability for us to learn lessons and make changes if needed going forward.

COMMISSIONER MAGWOOD: Juan, were you around back in the '90s and they were doing this?

[simultaneously speaking]

JUAN PERALTA: [inaudible] everyone else.

COMMISSIONER MAGWOOD: Okay, so you're older than you look then?

JUAN PERALTA: Yes.

COMMISSIONER MAGWOOD: Thank you very much.

JUAN PERALTA: You're welcome.

CHAIRMAN JACZKO: Commissioner Ostendorff.

COMMISSIONER OSTENDORFF: Thank you. I'd like to add my thanks to you and your team in NRO and across the entire NRC staff for

their hard work and professionalism; I know this is a team effort, cuts across the entire agency, and I appreciate that hard work. And from time to time when we appeared before the congressional committees, were asked yes or no questions, and we always have some trepidation about being asked yes or no question, but I'm going back now to the hearing, prehearing question, and I've got to ask a question; I'll ask it as a yes or no. But will provide you the opportunity to explain it if you need to.

So, let's put aside the administrative issues. Let's put aside timing, scheduling of license condition versus post-license issuance requirements that might result from Fukushima. So, let's put aside schedule administration costs, et cetera. Let's talk strictly about the technical requirements that would be imposed upon the licensee. Are those technical requirements any different between pre-issuance licensed condition technical requirement, on the one hand; on the other hand, post-license issuance technical requirements being imposed?

SCOTT FLANDERS: No different.

COMMISSIONER OSTENDORFF: Thank you. Let me shift to tag on some of my colleagues' here the questions on the Part 52 process, and I know others have addressed this but I just want to bore down on one piece of it, with respect to the design certification we got from COL, SCOL. Did the SCOL process result in the efficiencies that you thought it would, as far as NRC staff work?

FRANK AKSTULEWICZ: I believe so. I think we've, not so much

with the Summer application, but we're seeing the real benefits in the subsequence after that. And again, it's just because of the timing of these applications being sewed together. The ability to translate the lessons learned from one to the other was difficult. And so the progression of this into Levy [spelled phonetically], and we're seeing Levy move through the licensing process much swifter than the Summer application even, because there are a more concentrated focus on the site-specific interface questions. The design issues associated with the nuclear island and other are set aside, and move through that process very quickly instead of repeating the reviews of those over and over.

MICHAEL JOHNSON: We certainly appreciate all the questions regarding the process and how well it's worked. We actually owe the Commission a look at the process, and we'll do it after we complete the Summer Vogtle, those actions. We'll sit back and look at all the aspects of the process, including the VSCOL process work, like we thought it would -- was -- all of those and we'll provide the Commission with the recommended changes to the process.

COMMISSIONER OSTENDORFF: Thank you. Let me -- Scott, I'm going to ask you a question, just a minute, on the environmental. But I want to acknowledge and appreciate the appearance today our Army Corps of Engineers, partners as a cooperative agency I think the Commission's currently grateful for your efforts and for the work that you have conducted with our NRC staff. Scott I'd asked a question of the applicant, in the earlier session I asked you the same kind of question.

I know that NRC staff has worked with a number of federal agencies, there's no cookie cutter approach as to how one agency business that translates into how another agency does business, and there will always be some differences in approaches both in the federal agencies as well as in the state agencies so long as it comes to environmental issues. Are there any fundamental differences that you and your team have experienced in the environmental review portion between how we, NRC, approaches environmental issues and how other federal or state agencies approach those issues that caused a problem?

SCOTT FLANDERS: No. The approach in terms of how we address environmental issues and other federal agencies address environmental are fundamental the same. I think the differences really extend from each agencies regulatory or oversight responsibilities. And in their -- that results in focusing in certain areas versus other areas, which is some of the issues that we saw with the Corps, but fundamentally in terms of reviewing impacts and carrying through and executing EPA and the scope of issues that need to be considered in consultation with other regulations, they are fundamentally the same in our approach. And I'd like to add that the work that we do at the Corps, in the Corps and the Corps as a cooperative agency, was tremendous and very efficient and very effective throughout the process.

COMMISSIONER OSTENDORFF: Thank you.

CHAIRMAN JACZKO: Thank you, Mr. Chairman. We'll now take a quick five minute break. Thanks.

(Whereupon, a short recess was taken)

CHAIRMAN JACZKO: So we'll now reconvene for the remaining panels. The applicant is expected -- this will be safety panel number one, the applicant is expected to discuss the contents of the COL application, while the staff's expected to set the review process and regulatory conclusions. These panels should include a discussion of site specific ITAAC and all the licensed conditions associated with the subject matter of the panel. Our first safety panel, a safety specific panel, will focus on the first few chapters of the final safety evaluation report and relevant sections reapplication. Would all witnesses at the table please state your name and title for the record? We'll start first with the applicant.

AMY MONROE: Amy Monroe, Senior Licensing Engineer, South Carolina Electric and Gas Company.

STEPHEN SUMMER: I'm Stephen Summer, Supervisor of Environmental Services and SCANA Services.

JOSEPH SEBROSKY: Joe Sebrosky, Leading Safety Project Manager for the Summer COL Review.

MICHELLE HAYES: Michelle Hayes, Reactor Systems Engineer, Office of New Reactors.

JOHN SEGALA: John Segala, Chief of the Balance of Plant Branch, Office of New Reactors.

CHAIRMAN JACZKO: Thank you. We'll start now. If we can ask the staff to kind of [inaudible]. We'll let the applicant go for 15 minutes.

AMY MONROE: First slide, please? You can actually move to

the second slide, please. This panel discussion will be addressing the information contained at FSAR Chapter One, the Introduction and Interfaces, and portions of Chapter Two. Within the Chapter Two discussion, we'll provide more detail on the exemption and departure required from the DCD site parameter for the maximum safety wet bulb, non-coincident air temperature. Next slide, please.

Chapter One contains both standard and site specific material. As with the rest of the application, the guidance found in Regulatory Guide 1.206 was utilized to inform both format and content of the chapter. The portions of the chapter containing more site specific information are as follows. The chapter gives specific information to detail where and how combined license information items are addressed within the application. While many of the COL information items are standard in nature, as you would expect with the standards design, several are site specific because of the need to address them in a manner that relates specifically to the VC Summer site location. The chapter specifies and lists departures that are included in the FSAR and identifies them as standard or site specific.

It also notes which specific portions of the FSAR are impacted. Chapter One also details compliance with the regulatory guide. I would identify this as being the site specific portion of the application, most of its standard in nature, again we believe that because the design is standard. However, the site specific portions are primarily used as stated in the physical differences that exist from one site to another, or simply because the FSAR, specifically Chapter Two,

section number varying slightly, so you point to different sections.

An example of the site specific Regulatory Guide compliance item, would be Regulatory Guide 1.138, dealing with the laboratory analysis of rocks and soil for engineering analysis and design. Being a hard rock site, the analysis will be different than, say, that of a soil site. Therefore the compliance with this regulatory guide would be site specific in nature, both because of the physical site characteristics and because of the specific methods there in Chapter Two, sections referenced within our application. I have only detailed a few of the sections of Chapter one, Chapter One contains all the information required by regulatory guide 1.206. Next slide, please.

Chapter Two contains only site specific material. It describes the details of the physical site characteristics, and provides the basis for the accessibility of locating, or siting an AP1000 unit. Specifically, 10 CFR Part 52 requires that the applicant provide appropriate information to demonstrate that the specific site characteristics fall within site parameters identified in the DCD. The nomenclature is that if a site characteristic is a specific feature of the physical site, or a site parameter, there's a specified feature requirement contained in the DCD. Next slide, please.

As requested, we'll now address in a brief overview the more notable content in the first sections of Chapter Two. The last two sections will be described in panel two later on today. Next slide, please.

The site parameters identified in Tier 1, Table 5.0-1 and

Tier 2, Table 2-1 of the DCD. Our FSAR has a corresponding Table, which is 2.0-201, and it provides a comparison of the site parameters with the VC Summer site characteristics. The parameters required to be addressed are listed on the slide. As you can see, it covers land, water, and atmosphere conditions. Next slide, please.

With only one exception, the site chosen for the new VC Summer unit fall within the AP1000 site parameters. The one exception is the calculated value of maximum safety wet bulb, non-coincident air temperature. Please note that the AP1000 site parameters include both a coincident wet bulb temperature, and a wet bulb temperature that coincides with specific dry-bulb temperature at a specific time, and a non-coincident wet bulb temperature, which occurs independently of any specified dry-bulb temperature. The only parameter that requires any exemption is the non-coincident value. Next slide, please.

The DCD definition of maximum safety wet bulb, non-coincident air temperature is the highest wet bulb temperature measured at a site, excluding peaks of less than two hours duration. Within that application, the value that was ultimately utilized corresponds to a 100 year return period derived through the linear regression analysis, using individual daily maximum wet bulb temperatures recorded over 30 years at Columbia South Carolina National Weather Service Station. The Columbia National Weather Service Station is the closest fresh water station and is considered to be representative of conditions that are expected to be observed at the VC Summer site. This derived value is based on actual daily maximum wet bulb temperatures. Therefore, this value takes into

account temperature spikes or peaks. This method is considered conservative relative to the DCD parameter requirements, and therefore provides an increased conservatism in the defining the siting characteristics. Note the final value is calculated to be 87.3 degree Fahrenheit, versus the DCD parameter of 86.1 degrees Fahrenheit. Therefore only a 1.2 degree Fahrenheit difference. Next slide, please.

However, because the VC Summer value was not added by the DCD parameter, a departure was required to be introduced in the FSAR. Also because the parameter is contained in Tier 1 information Table 5.0-1, an exemption from 10 CFR Part 52 Appendix D, Section IV A2D is also required. The evaluation reporting the departure and the exemption are contained in COLA Part 7, sections Alpha and sections Bravo, respectively. Next slide, please.

Subsequent to determining the new maximum safety non-coincident, wet bulb air temperature, we had Westinghouse perform a qualitative and qualitative evaluation to determine the impacts of the new values for VC Summer on the acceptability for utilization of the AP1000 design. This wet bulb input potentially has both direct and indirect impacts. Possible direct impacts include system performance variations that have wet bulb temperature inputs, such as service water systems, temperature due to cooling tower performance, and passive containment cooling system pressure following a design basis accident.

Possible indirect input includes system performance changes due to the potential for increases in cooling water temperature in the service water system, and component cooling water system. Another

example would be the Nuclear Island non-radioactive ventilation system performance, which is sensitive to both temperature and humidity. This slide lists the DCD aspects that required specific analyses and evaluations to support departure and exemption. The NRC staff reviewed these evaluations and in addition, a public meeting was held to discuss the technical aspects of the justification in greater detail. Next slide, please.

The results of the evaluation performance concluded that the maximum safety wet bulb, non-coincident air temperature value calculated for the VC Summer Units 2 and 3 would not have an adverse impact on a non-safety or safety-related system, structural components, their functional capabilities or analyses methods as presented in the DCD.

Prior to the incorporation of DCD Rev. 19 into our licensing basis, an additional review was conducted to ensure that the conclusions of the departure and exemption evaluations remain valid for Rev. 19. Now Mr. Summer will provide a discussion FSAR section 2.1 and 2.2. Next slide, please. Steve?

STEPHEN SUMMER: Thank you. Geography and Demography. The Summer Station units on the two three slide is located in Central South Carolina, in the Piedmont Section of the State. Approximately 140 miles from the Atlantic Coast, and approximately 90 miles for the base of the Blue Ridge Mountains. It's in a rural area surrounded largely by forest and land. According to 2000 Census data, the largest town located within a 10 mile radius of this site is Chayton [spelled phonetically], located in northern Lexington County with a population of 628. The

nearest interstate highway is I-26 is located approximately eight miles from the site. It connects Columbia, South Carolina with Spartanburg, South Carolina. This area is characterized by the gentle, rolling hills, and roughly broad stream valleys. The site is south of the Monticello Reservoir, and it's bounded on the west by the Broad River. The combined exclusionary boundary which is not visible in this slide, covers approximately 2,600 acres. The combined exclusionary boundary consists of the existing Unit 1 exclusionary expanded to encompass the new units. This area encompasses parts of the Monticello Reservoir, and the Fairfield Pump Storage facility. SCE&G owns all land that's in the combined EAD [spelled phonetically],which also serves as a site boundary. Next slide, please.

The site is located in a sparsely populated region. As can be seen from this population chart, the population contained within a 10 mile radius, the site is only slightly greater than one percent of the total population contained in the 50 mile radius of the plant site. The largest population concentration is found between 20 and 30 miles, and is largely attributable to the city of Columbia, which is located in central Richland County, and serves as a state capital. Next slide, please.

The only major industrial facilities within five miles of the sites are the facilities owned and operated by SCE&G. The Summer Station Unit One Fairfield Pump Storage Facility, par hydro -- par combustion turbines. All of these facilities are approximately one mile or greater from end distance away from the Units 2, 3 site. The natural

gas pipeline, which supplies natural gas to the par combustion turbines, terminates at that facilities approximately one half miles to the south.

Norfolk Southern Railway generally runs along the edge of the Broad River. The closest this rail approaches the Units 2 and 3 site it's approximately 4,200 feet, or three-quarters of a mile.

Site specific chemical toxicity, asphyxiation, flammability, and explosion hazards were evaluated for these three areas using the guidelines in the applicable regulatory guides. For instance 1.78 for toxicity, and 1.91 for explosion hazards. They were found to be acceptable either due to low probability of occurrence or due to insignificant or accepted low impact.

Site location and the distance from the hazard sources from the local topography were additional favorable factors in the evaluations. While no commercial navigation takes place in the waterways in the vicinity of the site, the Broad River, Par Reservoir and Monticello reservoir, they are used for recreational purposes.

Because of the lack of commercial transport, the potential safety effect of this site is considered insignificant. The closest military facility, the Fort Jackson training facility, is located approximately 24 miles from the site, and because of the large separation distance, no further analysis is required. Several small airports are located within a 25 mile radius of the plant site. However, due to a combination of their size and activity, the distance from the site, none of these facilities are considered a safety hazard to the site. Aircrafts and airway hazards were evaluated in accordance

with the requirements contained in section 3.5.116 and NUREG 0800. In all cases, the results of the evaluations showed that the risk to be insignificantly low, and meet the acceptance criteria of NUREG 0800. Because of the lack of any additional industrial facilities, other than the SCE&G facilities, within a 5 mile radius, no additional industrial hazard analyses are required. This concludes our presentation.

CHAIRMAN JACZKO: Thank you, I'll hear from the staff.

JOSEPH SEBROSKY: Good morning. My name is Joe Sebrosky and I am a Senior Project Manager with the Office of New Reactors. I've been working as the Lead Safety Project Manager on the VC Summer Units 2 and 3 combined license for COL application since February of 2010. Prior to being the Lead Safety PM for the Summer COL application, I was the lead safety PM for the Bellefonte Unit 3 and 4 COL application from the date of receipt of that application, in October 2007 until February of 2010.

In this panel discussion, I will provide an overview of Chapter One of the staff's safety evaluation report for Summer Units 2 and 3 COL application. My colleague to my left, Michelle Hayes, our reviewer in NRO's division of safety assistance and risk assessment, and John Segala, NRO Balance of Branch Chief and Balance of Plant section, will then present a discussion of the non-coincident wet bulb temperature question that was part of the staff's evaluation of the Summer COL application.

Finally, I will then present highlights of the Summer COL final safety evaluation report, Sections 2.1. and 2.2., related to

geography and tomography, and nearby industrial transportation in military facilities. I would also like to acknowledge the staff, the NRC staff members that are to the right of me that performed the review in these areas. The staff performed the review and developed the safety evaluations. They are here to help, to answer any detailed questions that you may have related to the staff's review in these areas. Next slide, please.

The final safety evaluation report for Chapter One of the Summer Unit 2 and 3 COL application consists of several parts. Specifically this chapter contains an overview of the 18 parts of the combined license application and how they were reviewed. It also provides a discussion on the departures and exemptions, including those found in Part 7 in the application, and how the design centered of review approach was applied to the Summer review. FSAR section 1.4 documents the staff's evaluation of Chapter One for the Summer COL final safety analysis report. Next slide please.

Section 1.5 of the staff's safety evaluation documents the staff's review of information in the Summer COL that was not reviewed in other FSAR chapters. These evaluations include the staff's review of South Carolina Electric and Gas and South Carolina Public Service Authority, also referred to as Santee Cooper -- financial qualifications is found in 1.5.1 of the FSAR. This review will be discussed later in this presentation. The staff's review of requirements associated with the Nuclear Waste Policy Act of 1982 is found in section 1.5.2 of the FSAR. The staff states that if the Commission deems necessary that it

could require that an applicant for a nuclear power plant operating license have entered into an agreement with DOE for disposal of high level waste that may result from the use of such a license. The staff's review documents that South Carolina Electric and Gas has entered into these contracts for Summer Units two and three. The safety review involves notification of federal and state agencies and the public. These notifications are discussed in section 1.5.3 of staff's FSAR. This section of the FSAR includes a discussion of the staff consulting the Department of Homeland Security in accordance with the Energy Policy Act of 2005 and that the notifications required by 10 CFR50.43A have been made.

The staff's evaluation of exemptions associated with the final safety analysis report summary and associated criteria and special nuclear material, control our [unintelligible] program is found in section 1.5.4 of the FSAR. These are consistent with similar exemptions evaluated in the Vogtle COL applications. Finally, the staff's review to support the issuance of 10CFR part 30, 40 and 70 licenses is found in section 1.5.5 of the FSAR. This evaluation is a standard evaluation for the AP1000 COLs and was discussed during Vogtle three and four COL mandatory hearing. Next slide, please.

FSAR section 1.3 provides the cross reference of the exemptions associated with the application and where they are evaluated in the FSAR. This slide provides an overview of the exemptions associated with the application. The first three exemptions on this slide were highlighted in the previous slide's discussion. The maximum

safety wet pool [unintelligible] and air temperatures exemption will be discussed in more detail later in this presentation. Next slide please.

In the cases where the Summer COL application does not meet an NRC requirement an exemption was evaluated by the staff. There were also cases where a departure from the AP1000 certified design was evaluated by the staff. Part 52 NRC codifies the AP1000 design and it contains requirements for an applicant referencing designs to evaluate the departures from that design. This slide provides a summary of these departures associated with the Summer COL application. Slide uses numberings from the Summer application to identify these departures. TET is the designation for a departure. It is proceeded by either a STD or TCS designation. The STD designation indicates that the departure is standard to AP1000 COL application. A TCS designation indicates that a departure is site specific.

The first three departures on this slide also involve processing and exemption. Standard departure 8.3-1 associated with the class one E voltage regulating transformer current 1A features and site specific departure 18.8-1 associated with emergency response facility locations are evaluated in sections 8.3.2 and 13.3 of the Summer COL FSAR respectively. Next slide please.

Part 2 of the Summer COL application is the final safety analysis report. This table, part of the Summer [unintelligible] COL FSAR chapter one, identifies whether the information contained in this chapter is incorporated by reference or IDR, standard content, site-specific, or supplemental information to standard content material. For

example, section 1.9 in compliance with regulatory criteria, indicates that the information is IDR [unintelligible] standard and site specific supplements. Compliance with certain regulatory guides is a result of referencing design and certification, identified as IDR, while compliance with other regulatory guides is either identified as standard content applicable to all the AP1000 COL applicants identified as standard, or is site specific to the Summer COL, identified as site specific. Regardless of whether the information is IDR, standard or site specific, section 1.4 of the FSAR documents the staff's evaluation of Summer COL FSAR chapter one. Next slide please.

The staff reviewed information provided by South Carolina Electric and Gas in sections 1.4 in chapter 17 of the FSAR about the applicant's technical qualifications. Review included an evaluation of operating experience and a quality assurance, or QA program, of SC and G. SC and G oversaw the construction of EC Summer Unit 1 and currently holds the 10 CFR part 50 license to operate this plant. The staff reviewed the QA program and finds it acceptable in FSAR chapter 17. Based on the staff's evaluation of SC and G's experience of building and operating DC Summer unit one, and its QA program, the staff concludes that South Carolina Electric and Gas is technically qualified to hold licenses for Summer Units 2 and 3 under 10CFR part 52 in accordance with section 52.97 A14. Next slide please.

The staff reviewed information provided by the applicant about financial qualifications found in Part 1 of the application. The review included an evaluation of financial qualifications,

decommissioning funding insurance, foreign ownership, and nuclear insurance and indemnity. Staff evaluated information about the total construction cost for Summer Units 2 and 3. Staff also reviewed owner's cost, financing cost and information pertaining to funding sources for the two Summer Units 2 and 3 owners, South Carolina Electric and Gas and Santee Cooper. Applicable regulations considered by the staff included part 140, sections 50.33, 50.75, 52.97 A14 and section 1A2 and appendix B for part 50. The applicable guidance is found in NUREG 1577, which is the standard review plan on power reactor licensee financial qualifications and decommissioning funding insurance. Based on the staff's evaluation on financial information provided by South Carolina Electric and Gas the NRC staff concludes that the prospective co-owners have provided reasonable assurance that they possess or have access to the financial resources necessary to meet estimated construction costs, operation costs and decommissioning quality. Therefore, the NRC staff concludes that the applicant is financially qualified to construct and operate Summer Units 2 and 3 and engage in activities authorized by the licenses. This ends my presentation on FSAR chapter one. I would now like to discuss FSAR chapter two. Next slide please.

The AP1000 site parameters were established as part of the AP1000 design certification and review of chapter two of the AP1000 DCD. The site parameters include values, guidance identified on this slide, including parameters for items such as air temperature, seismic values, soil, and atmospheric [unintelligible]. Many of these site parameters are captured in DCD Tier-1 material. Therefore, if an applicant cannot

demonstrate compliance with these DCD Tier-1 site parameters it must seek an exemption. FSAR chapter two, site characteristics, is based on the staff's review of Summer FSAR chapter two. Chapter two of the Summer FSAR addresses the geological, seismological, hydrological, and meteorological characteristics of the site and vicinity in conjunction with present and projected population distribution and ion use.

Part of the staff's review of chapter two was to determine whether the staff's review of site characteristics identified by the applicant are appropriate. In addition, the staff reviewed the Summer COL FSAR site characteristics to ensure that the characteristics identified by the applicant are bounded by the site parameters that are identified in the AP1000 design control document. With the exception of the maximum safety wet bulb non-coincident air temperature values the staff found that the characteristics of the site all within the site parameters specified in the design certification. I'll now turn the presentation over to Michelle Hayes, who will discuss the maximum safety wet bulb non-coincident air temperature exemption request.

MICHELLE HAYS: Good morning, my name is Michelle Hays and I'm one of the technical reviewers who evaluated the Summer request for an exemption to and departure from the certified design value for the maximum safety non-coincident wet bulb temperature. I will present the containment and ventilation branch, the balance of plant branch, the siting and accident consequences branch and the reactor system branch were also involved with this review. Before I get into the specifics of the exemption, I will discuss some of the terminology. Next slide

please.

The dry bulb temperature is the actual temperature of the air, as measured by a thermometer. The wet bulb temperature is a derived temperature. It represents the lowest dry bulb temperature that can be obtained by evaporating water into the air at constant pressure. A higher wet bulb temperature means the air is wetter, and can therefore absorb less water vapor than a lower wet bulb temperature. The wet bulb temperature is derived from observations of dry bulb temperature, dew point temperature and atmospheric pressure. It is directly related to the relative humidity of the air.

The coincident wet bulb temperature is the wet bulb temperature that was recorded at the same time as the dry bulb temperature. Because the coincident wet bulb temperature is based on how much the air will cool when evaporating water into it, the coincident wet bulb temperature is always cooler than or equal to the dry bulb temperature. The non-coincident wet bulb temperature is the wet bulb temperature that is recorded regardless of the dry bulb temperature. Next slide.

The maximum safety non-coincident wet bulb temperature is a site parameter in the AP1000 certified design. Appendix D to Part 52 requires the COL applicant to demonstrate that the characteristics for the actual site are bound by the DCD site parameters. Because the maximum safety non-coincident wet bulb temperature for the Summer site is not bound by the AP1000 certified design, the COL applicant requested an exemption from this part of the rule.

The change to the maximum safety non-coincident wet bulb temperature also required a departure from the information in the certified design. This departure was from material on both Tier-1 and Tier-2 of the AP1000 DCD. Tier one is the portion of the design related information in the generic DCD that is approved and certified in the Appendix D to Part 52. The safety site parameters, which are included in Tier-1, are extracted from Tier-2. Tier two is the portion of the design related information in the generic DCD that is approved, but not certified by Appendix D to Part 52.

The regulations for gaining an exemption from Tier-1 information are included in Appendix D to Part 52. Additional regulations regarding exemptions are in Part 52 under finality of design certifications and specific exemptions and also in Part 50 under specific exemptions.

The regulation for granting a departure from Tier-2 information is found in Appendix C to Part 52. This regulation states that a departure from Tier-2, that involves a change to Tier-1, requires prior NRC approval. Because the change to the maximum safety non-coincident wet bulb temperature involves both Tier-1 and Tier-2, the COL applicant requested prior NRC approval for the departure. Next slide.

The staff was required to make four findings on this exemption request. The first, is that the change will not result in a significant decrease in the level of safety otherwise provided by the design. Next, is that the exemption is authorized by law, will not present an undue risk to the public health and safety and is consistent

with common events and security. Next, is that special circumstances are present. The applicant stated that this exemption falls under circumstances of Section 15.12 that the application of the regulation is not necessary to achieve the underlying purpose of the goal.

Finally, the special circumstances outweigh any decrease in safety that may result from a reduction in standardization caused by the exemption. Next slide.

As discussed earlier, Summer is required to demonstrate compliance with the site parameters established in Tier-1 and Tier-2 of the AP1000 DCD. In addition, Section 52.79 requires COL applicants to provide meteorological characteristics of the proposed site based on historical data with sufficient margin to account for the data's accuracy, quantity, and period of reference. In the original application, the Summer site characteristics were derive from 30 years of historical data and these values were done by the DCD site parameters. In response to the staff's request for additional information, the Summer site characteristics were updated to reflect 100 year return period values. Using this approach, the applicant found that the maximum safety non-coincident wet bulb temperature would be 87.3 degrees Fahrenheit, this exceeds the DCD value by 1.2 degrees Fahrenheit and prompted the request for an exemption. The Summer analysis extrapolated the 100 year period values from 30 years of data recorded at the Columbia, South Carolina National Weather Service station, located about 26 miles from the site. The values of the Summer site characteristics for all other safety and normal temperatures remain

bound by the AP1000 DCD values. Next slide.

The staff reviewed the applicant submittal and used the REI process to interact with the applicant. The staff found that the final application, which included the 100 year return period values, was consistent with Section 2.3.1 of the standard review plan. The staff performed an independent analysis using 32 years of data for the same Columbia weather station and from the applicant's analysis was bounding. Based on this review, the staff found the applicant's analysis to be acceptable and conservative. Next slide.

While the 1.2 degrees Fahrenheit increase in maximum safety non-coincident wet bulb temperature is relatively small from an engineering perspective, the staff reviewed the impact on an array of systems. The systems that are sensitive to this change are systems that rely on evaporative cooling or systems used to maintain relative humidity. The staff found that many systems are unaffected because they are designed for the temperatures which did not change, the maximum safety dry bulb temperature or the maximum normal non-coincident wet bulb temperature. Other systems are not affected because conservative assumptions are made regarding physical conditions.

For example, the spent fuel pool time to boil calculations conservatively exclude evaporation, so this analysis was unaffected. The affected systems of interest are the passive containment cooling system, the service water system and the nuclear island non-radioactive ventilation system. Next slide.

The safety related passive containment cooling system relies

on evaporative cooling and air and water conduction to remove heat from inside the containment atmosphere following the postulated accident. The passive containment cooling system air flow path is designed to always provide natural convection cooling along the outside surface of the containment vessel. During the postulated accident, the passive containment cooling system also delivers water over the outside surface of the containment vessel to provide gravity driven convection cooling. These mechanisms, combined with the evaporation of the water, make an effective post-accident containment cooling system. The COL applicants submitted calculations using the same thermal-hydraulic model of the AP1000 that was used for the DCD analysis, except that the relative humidity was increased from 31 percent to 34 percent, to conservatively bound the change in maximum safety non-coincident wet bulb temperature. The results demonstrated no discernible increase for the containment peak pressure value identified in the AP1000 DCD. The staff's review was informed by the RAI process, an audit of the supporting calculations and an independent analysis. For the independent analysis, the staff ran their own thermo-hydraulic model, which was developed during the review of the DCD, with the higher relative humidity and the results confirmed the applicant's conclusion. Based on its review, the staff found the applicant's analysis to be acceptable, conservative and consistent with Section 6.2.1 of the standard review plan. Next slide.

The surface water cooling system, which is non-safety related AP1000 is impacted because it used cooling power that relies on evaporative cooling. With the 1.2 degree Fahrenheit higher safety non-

coincident wet bulb temperature there is slightly less evaporative cooling, so the system and components directly or indirectly cooled by the service water system will have cooling water at a slightly higher temperature. The maximum component cooling water temperature is expected to increase about 0.3 degrees Fahrenheit. The staff found the change acceptable because it remains below the DCD design parameter of less than 100 degrees Fahrenheit.

The component cooling water system supports 12 systems and components. Three of these, the reactor coolant system pumps, the non-safety spent fuel pooling -- pool cooling and the safety residual heat remover are shown here for illustrative purposes. The applicant evaluated each of the systems and determined that the existing design capacity could accommodate the higher temperatures. The staff reviewed the application and the applicant's RAI response. Additionally, the staff performed audits on several of the calculation packages. Next slide.

Another affected system is the nuclear island non-radioactive ventilation system. This system provides normal ventilation to the nuclear island including the control room and safety related battery rooms. Although the system cools areas that contain safety related components during normal operation, it is a non-safety system. The associated safety related habitability system which relies on passive features, is designed to a maximum safety dry bulb temperature so it is unaffected by this exemption.

The nuclear island non-radioactive ventilation system is

affected because the higher wet bulb temperature results in the higher heat load for the chillers. The applicant determined that the existing chillers were adequately sized to accommodate the higher loads. The staff reviewed the application, audited the supporting calculations and came to the same conclusion. Next slide.

In summary, the staff reviewed the applicant's exemption and departure request. The staff used request for additional information, audits of the applicant's supporting analysis, and independent calculations to determine that the maximum safety non-coincident wet bulb temperature did not adversely affect the functional capabilities of safety-related or Defense-in-Depth structures systems or compliance. The staff also found that the four exemption criteria were met. There is no decrease in safety as a result of this exemption. The exemption was authorized by law because it is consistent with the Atomic Energy Act. The special circumstances are that application of a regulation is not needed to achieve the underlying purpose of a rule, and these special circumstances outweigh any decrease in safety that may result from the reduction and standardization. The staff notes that this exemption did not alter any structure, system, or component, so there is no reduction in device standardization.

As such, the staff found that the applicant met all the requirements for granting an exemption from the certified design, the regulation are satisfied, and an exemption from the AP1000 DCD is justified. For these same reasons, the staff is granting the exemption request, the staff also finds that departure from Tier-2 information

should be acceptable. Mr. Sebrosky will now continue this discussion on remaining Chapter Two items.

JOSEPH SEBROSKY: Next slide, please. I will now discuss sections 2.1 and 2.2 of the FSAR. The purpose of the geography and demography review in section 2.1 of the FSAR is to determine whether the applicant has proposed an acceptable site, including acceptable site boundaries with appropriate consideration of nearby populations and natural and man-made features. As shown on this map Summer Units 2 and 3 are going to be located approximately one mile to the south of existing Summer Unit 1, and a rural area in Fairfield County, South Carolina. The map shows the location of the Monticello Reservoir, to the north of Units 2 and 3, and the Broad River running generally north to south to the west of the proposed facility.

The Par Reservoir, located approximately one mile left of the proposed site for Units 2 and 3 on the Broad River, was created in 1914 by the construction of a dam of the Broad River Par Shoals. The map also shows the rail line that runs along the Broad River. The Broad River, Monticello Reservoir, Parr Reservoir, and the rail line will be discussed later in this presentation.

The low population zone is the area falling within the three mile radius circle around Unit 1. It's shown on the figure on this slide. Next slide, please.

As shown on this map, the largest population center is Columbia, South Carolina, located approximately 14 miles to the southeast of the site. The NRC staff used publicly available maps and

satellite pictures. The site visit and the area map provided in Units 2 and 3 FSAR to verify that no publicly used transportation modes, or public roads cross the proposed exclusion area boundary. Therefore, arrangement for the control of traffic in the event of an emergency are not required.

The staff reviews demography and population estimates provided by the applicant. The staff performed independent calculations using Census data to project the population in the area after the years 2016. Based on the staff's review, the staff determined that the following Part 100 requirements were met. The applicant specified low population zone as acceptable because it was determined there were appropriate protective measures could be taken in the event of an accident.

The nearest boundary of the closest population center containing 25,000 or more residents is at least one and one-third times the distance from the reactor to the outer boundary of the low population zone, or LPZ. The nearest population center for the Summer site with more than 25,000 residents is the city of Columbia, South Carolina, with a 2,000 population of 116,278. The closest point of Columbia’s corporate limit to the Summer site approximately 14.5 miles to the southeast. This distance is over seven times the distance from the center of Units 2 and 3, to the closest LPZ boundary, and 4.8 times the radius of the LPZ because the LPZ is centered on Unit 1. Both of these distances meet the requirements that the population center distance be at least one and one-third times the distance from the

reactors to the outer boundary of the LPZ.

In addition, the staff also found the population density does not exceed the guidelines given in Reg. Guide 4.7. Therefore, the applicant does not need to give special circumstances to alternative sites. Next slide, please.

In Section 2.2 of the FSAR, the staff analyzed hazards from nearby industrial transportation and military facilities. One of the criteria used to assess nearby hazards is to determine whether the plant is at least two miles beyond the nearest edge of a federal airway, holding pattern, or approach pattern. The applicant identified and the staff agreed the criterion was not met for airway V53, which passes approximately two and a quarter miles southwest of the site on a heading of 331 degrees from the Columbia, South Carolina Metropolitan Airport. Federal airways are typically eight nautical miles wide, extending four nautical miles from the center line. Since the center line of airway V53 is approximately two and a quarter miles from the site, this criterion is not met.

Therefore SCE&G performed calculations to determine whether it met the staff guidance that the hazard is acceptable if it is on the order of one times ten to the minus seven per year probability of accidental crashes at the site. The staff performed independent probability calculations using their most conservative total flight data within five miles of the plant, obtained from the Federal Aviation Administration for airway V53. Using this conservative data, the NRC staff determined that the total aircraft accident probability is on the

order of one times ten to the minus seven acceptance criteria found in NUREG 0800 Section 3.5.1.6, and is therefore acceptable. Next slide, please.

This slide summarizes the staff's review of the potential explosive and chemical hazards. SCE&G considered explosion hazards both on-site and in the vicinity of the site. Explosion hazards can be present on nearby highways, the rail line that runs along the Broad River, and the gas line in the vicinity Summer Unit 2 and 3. The Broad River and Parr Reservoir and Monticello Reservoir are not navigable for commercial shipping; therefore, they were not considered in the hazard evaluation.

Based on the information obtained from the site visits and public information about recreational use of these waters, the staff agrees that not large quantities of hazardous material are transported on these waters. The staff performed an independent evaluation of SCE&G's analysis of the term that explosion hazards near the site are located at safe distances.

Similarly the staff performed independent evaluations of toxic gas, toxic chemical hazards associated with chemicals stored in Summer Unit 1, proposed to be stored on Unit 2 and 3, and transported on the rail line that runs along the Broad River. The staff determined that these chemical hazards will not adversely affect control room capability. This completes our presentation for this panel.

CHAIRMAN JACZKO: Well, thank you. As you look at -- well, there's a number of hazards that you look at: flooding, dam failures,

aircraft crashes and all these things, separate from the aircraft impact rule. Do any of these stand down as areas in which there's more hazard than others? Or are they all -- what's your sense for this particular site?

JOSEPH SEBROSKY: There are no hazards that stand out. The only thing that we discussed in this panel was 2.1 and 2.2. And there are no military or industrial facilities, the rail line is a mile away from the site, we reviewed that. In the panel two presentation you're going to hear about the hydrology of the area. It sits on a bluff, 100 feet or so above the Broad River, so flooding really isn't an issue. And you're also going to hear quite an extensive discussion about the earthquake hazard this afternoon. And we found as documented, it's Chapter Two, that they met all our regulations and criteria.

CHAIRMAN JACZKO: You mentioned the gas line, I believe that goes through the site or runs nearby the site. When you analyze that do you analyze that from a safety accident perspective, or is there a component where you look at sabotage from a security perspective to that? Is there a significant difference with that at all?

JOSEPH SEBROSKY: I'll turn to Dave Brown, but to give you a quick answer. We looked at how big the gas line is, and safe distance calculation --

CHAIRMAN JACZKO: [unintelligible] initiating event, essentially?

DAVID BROWN: I'm Dave Brown, I'm the [inaudible] and Accident Consequences Branch, and I have been sworn in. The evaluation

of the pipe line hazard is to assume that the pipe breaks. And evaluate, you now, what is the thermal and explosive hazard at that distance. It's over a mile away.

CHAIRMAN JACZKO: Okay, thanks. As we look at the issue of the wet bulb and the time to boil off spent fuel pools, when you look at that issue you assume, obviously, the current plan is for spent fuel storage in the pools. And I assume right now, I don't know if you're looking at medium racks, they're looking at --

JOSEPH SEBROSKY: Raul Hernandez is coming to the microphone. What was assumed in the analysis from John Segala, and correct me if I'm wrong, is what's in the AP1000 DCD Rev. 19. And Rev. 19 included the installation of high density racks. [inaudible] for a portion of the spent fuel pool.

CHAIRMAN JACZKO: Is that correct? Is there difference if the pool -- well, maybe I should ask him and maybe ask the applicant. I mean do your -- what's your intention with the pool? Do you intend to maintain that configuration in the pool and then move to dry cask storage, or do you intend to come in at a later date and request more high density racks and going to a higher density in the pool all together?

AMY MONROE: Currently, there is not intent to change or re-back the spent fuel pool.

CHAIRMAN JACZKO: Oh, thanks. If we look at going to the siting criteria -- I'll have to admit I'm rusty on my understanding the Part 100, every time I read it I get more confused. When we look at the

accidents, what type of accidents do we analyze under the Part 100 release criteria?

JOSEPH SEBROSKY: I'll turn to Dave Brown.

DAVID BROWN: It's Dave Brown. We look at any nearby military, industrial, and transportation facility within five miles of the plant.

CHAIRMAN JACZKO: No, I mean when we're looking at the citing criteria for the 25 REM boundary -- for the the reactor accidents, what kind of accidents do we consider?

DAVID BROWN: Those are design basis accidents, up to and including, you know, core damage accidents.

CHAIRMAN JACZKO: Do we look at simultaneous releases from the reactors?

DAVID BROWN: No. It's on a permanent basis.

CHAIRMAN JACZKO: What generally do we -- I mean from a part 100 release criteria, and again, this is where I honestly don't quite understand our regulations so you'll have to help me. When we have the 25 REM up the site boundary, that kind of tells you where your site boundary will be, two hour person at the site boundary or the total plume at the site boundary, whatever the exposure rate is, or the total exposure is. Where does Summer's come -- I mean are they, or is it magnitude below 25 REM, do they hit the 25 REM, are they 23 REM? What is, give me a sense of what that answers come out to be?

DAVID BROWN: I don't recall the answer to that, but I may turn to my colleagues. Michelle?

CHAIRMAN JACZKO: I don't know if Summer knows the answer. I have no idea whether these things are close or whether we're, you know, well up above it or --

MICHELLE HART: Yes, I'm Michelle Hart, I am a sworn witness, I work in the Siting and Accident Consequences Branch. And actually that analysis is part of Chapter 15; it' not done in Chapter Two. The design basis accidents incorporate, for Summer, incorporate the DCD analyses. And so the DCD analyses, some of them are very close to 25 REM, some of them are much less.

CHAIRMAN JACZKO: So if you add two units simultaneously, are there some cases in which you would exceed the 25 REM?

MICHELLE HART: If you were to just add the numbers together, yes, you would.

CHAIRMAN JACZKO: Okay, thank you. Let's see. Going to financial qualifications, Summer, while a very able utility, is not one of the largest utilities in the United States or South Carolina Electric and Gas. And I just had the opportunity to visit Bellefonte Station in Alabama which was a site that was started a long time ago, worked on, and for a variety of different reasons was never completed. Maybe you could just give me a little bit more detail about the qualifications for Summer, and to what extent we look at the possibilities of project delays, cost overruns, design concerns, and how that would impact the ability of the utility to ultimately deal with that issue. And if the applicant wants to answer too, that's fine. But, Mr. Szabo, do you want to --

AARON SZABO: Aaron Szabo, financial analysis. In relation to the general financial qualifications, as an electric utility, they are exempt from the more, I guess, in depth qualifications we'd be looking at. In relation to the sources of construction funds and general costs, we do look at both the sources of funds and about whether or not they are reasonable in relation to the costs. We did look at the overlay costs of it to see if they are just generally not unreasonable.

CHAIRMAN JACZKO: And what did you find in this case?

AARON SZABO: We found that they were in -- the overnight cost projection was not unreasonable, and that their sources of funds are reasonable, assuming that they're able to obtain them in the future.

CHAIRMAN JACZKO: Do we have some degree of margin in that calculation for potential cost overruns and things like that, or are we just assume a project that works as expected?

AARON SZABO: They did provide us with a cost estimate for their project, and we did do an independent analysis looking at other studies. And generally what those costs have been, as well as other applications submitals, and have found that it falls within the bounds that we'd find to be not unreasonable.

CHAIRMAN JACZKO: Okay. Thank you. Commissioner Svinicki?

COMMISSIONER SVINICKI: I have two clarifications to ask of the applicant first. On applicant slide 14, there's a statement that Marine, military, air, nautical and additional industrial hazards are not applicable, or probabilistically insignificant. As a point of clarification, could you define the term probabilistically insignificant

as used in this context?

AMY MONROE: If you'll allow me to check my notes, which I don't have available right now, I could provide you with that response.

COMMISSIONER SVINICKI: Okay, I can submit that for a post-hearing question, thank you. And on applicant slide eight, could you explain in layman's terms or something akin to that, the linear regression analysis used to develop the 100 year return value of the wet bulb temperatures, specifically, was it necessary, why was it necessary or appropriate to do a regression analysis? Would that be a typical approach, in your view, to this type of analysis? And is there a generally accepted methodology for doing that type of analysis? And if so, did you use it in this instance?

AMY MONROE: Again, I would like to refrain from providing a response at this point, and provide it to you as subsequent to the hearing, please.

COMMISSIONER SVINICKI: Okay, thank you. So those are my clarifications. I have additional questions for the staff. On staff slide 16, regarding the effects of the non-coincident wet bulb temperature exemption on the passive containment cooling system and so these questions get to the staff's approach here in terms of deeming the applicant’s approach acceptable and unacceptable. So the staff, as I understand it, they audited the applicant’s calculations, but in this instance, also conducted an independent analysis using a different model. So my questions goes to a bit of an elaboration on the independent analysis. First off, how did the staff determine which

model it would use for its independent analysis? And then why did the staff deem that it was prudent or necessary to conduct an independent analysis in this case when, as I understand in other cases like this effect of this particular exemption on say the service water system. The staff merely, or its approach was to audit the applicant's calculations. Is there someone who can address that? Thank you, Michelle.

MICHELLE HART: I did the independent analysis and we used a contained model, which we developed to review the AP1000 DCD, so we had that model available. And so I used it, actually updated it to changes they'd made since later Revs at that model and just ran it. It's a a safety system, which would be why we're little more focused on disconfirming their results, as opposed to some of the non-safety systems.

COMMISSIONER SVINICKI: Okay, so that's the key determinant in your threshold judgment about whether or not --

MICHELLE HART: For me, personally.

COMMISSIONER SVINICKI: -- to do an independent evaluation. And on staff slide 19, perhaps I'm just not understanding this, but there are findings one through four listed here. The first says there's no decrease in the level of safety otherwise provided by the design, and the fourth says that special circumstances -- I assuming you mean existing here, outweigh any decrease in safety that may result. Is that then a bit inconsistent? Because the determination or finding is that there's no decrease in the level of safety and number four says, well,

but the circumstances outweigh any decrease in safety.

MICHELLE HART: Do you mean, there isn't one?

COMMISSIONER SVINICKI: If there were, the circumstances would also weigh in favor of the exemption.

JOSEPH SEBROSKY: This is, again Joe Sebrosky. These findings on the exemption request are what's required that we make based on it being a Tier 1 exemption. So, in this case, when we say there's no decrease in the level of safety otherwise provided by the design, you heard Michelle discuss the confirmatory analysis that we did that confirmed that the applicant -- what the applicant's observations were when it comes to a safety system, which is the passive containment cooling system. And there was essentially no change.

The purpose of these different findings when you look at finding number four, special circumstances outweigh any decrease in safety, and that may result from the reduction in standardization. That was not the case here. There was no decrease in safety, but had there been a decrease in safety, one of the things that we would have looked at is compare that with what the special circumstances that you have to meet in any exemption request.

COMMISSIONER SVINICKI: I think what you're saying is they're the standardized template, but I'll allow the witness to answer.

JODY MARTIN: My name is Jody Martin, and I'm counsel for NRC staff. The reason that the [inaudible] seem inconsistent is we actually quoted the recommendation language, so it's just a quote from the recommendation language, which is why it uses the terms it does.

COMMISSIONER SVINICKI: Okay, but in terms of the findings, I think what you're indicating to me is that in total finding on the one, is that you found no decrease.

JODY MARTIN: Correct, and that made defining number four easy an easy finding it to make that point.

COMMISSIONER SVINICKI: Okay, thank you for that clarification. Other than Mr. Chairman, I guess the transcript will note I had those two questions that will be followed up on. So thank you.

CHAIRMAN JACZKO: Commissioner Apostolakis.

COMMISSIONER APOSTOLAKIS: Thank you. Slide 23 of the staff; it is related to a question that the Chairman asked, FSAR Section 2.2. nearby industrial transportation and military facilities. Isn't the existing unit nearby an industrial facility?

JOSEPH SEBROSKY: Yes, and it was considered in this analysis, yes.

COMMISSIONER APOSTOLAKIS: Was considered -- so you considered --

JOSEPH SEBROSKY: The chemicals that are --

COMMISSIONER APOSTOLAKIS. No, no, no. Nuclear accidents.

JOSEPH SEBROSKY: No. And I'll look to Dave Brown.

DAVE BROWN: The radiological habitability of the control room in Units 2 and 3 – I'm sorry, this is Dave Brown, again, would be assessed, considering an accident at Unit 1.

COMMISSIONER APOSTOLAKIS: But nothing else?

DAVID BROWN: I'm sorry?

COMMISSIONER APOSTOLAKIS: Nothing else? I mean, if there is an accident in Unit 1, how are Units 2 and 3 affected? Have we done that?

DAVID BROWN: The way we analyzed the effect of an accident at Unit 1 on operation at Units 2 and 3 is the habitability of the Units 2 and 3 control rooms.

COMMISSIONER APOSTOLAKIS: That's the only thing we --

DAVID BROWN: That's all.

COMMISSIONER APOSTOLAKIS: And that's what the regulations say explicitly?

DAVID BROWN: That's, yes.

COMMISSIONER APOSTOLAKIS: All right. Thank you. On slide 12, it's not on the slide, but I believe when you went over it, it has to do with the special circumstances, again. It said something like they're looking whether the request meets the intent of the rule. Did you use those words? So, what does that mean?

MICHELLE HAYES: In section 50.12, they give you a list of special circumstances that could be applied, and one of them is that the application of the regulation is not necessary to achieve the underlying purpose of the rule.

COMMISSIONER APOSTOLAKIS: And what -- how do you determine the underlying purpose of the rule?

JOSEPH SEBROSKY: In this case, what we've said in the SER in the Chapter Two – it's in 2.0 – where we found, where we evaluated, they

used different criteria's. What we said is the underlying purpose of the rule goes back to the tier I parameters, which are those parameters that are established to show that the plant can operate safely. This value increase from 86.1 to 87.3, we did the evaluation, and we determined that the plant can operate safely at that higher value. So, the underlying purpose of the rule is met.

COMMISSIONER APOSTOLAKIS: Which was safety?

JOSEPH SEBROSKY: Which was safety.

COMMISSIONER APOSTOLAKIS: Interesting. So, we have two things now. One is meeting the rule, and the other is meeting the intent of the rule correct? That's okay. Thank you.

CHAIRMAN JACZKO: Commissioner Magwood.

COMMISSIONER MAGWOOD: I think you mentioned during your presentation that the staff concluded that this site was -- I think the term used was an acceptable site for the point of these two units. And, it actually, it got me wondering, thinking back – can't help but reflect back as you look at these things? Take it back, I remember when a lot of people in the industry realized that the easiest thing for them to do would be to deploy new units at existing sites, larger for the purpose, obviously, of avoiding siting issues associated with, you know, emergency planning, all sorts of things. But when you, now that I've seen you've gone through significant analysis to look at the acceptability of this site, I have to ask the question – what circumstances might there be, given the fact that you mentioned don't look at multiunit events? What circumstances might arise in existing

nuclear power plant sites in the United States that's licensed and operating that would preclude it from hosting additional units?

JOSEPH SEBROSKY: Well, one of the things that's done for any of the designs that we certify – and Michelle talked about it – was the establishment of the tier I and tier II values, the site parameters. So, to indirectly answer your question, the AP1000 design, the seismic criteria that are established for it, would not allow it to be built currently at either Diablo Canyon or San Onofre. They would have to come in and sift like they did with this wet bulb exemption, seek an exemption from those seismic design parameters. But, to address the other part of your question, our criteria right now, other than there's some things associated with emergency plans and, as Dave mentioned, there are radiological effects that you look at from one unit to the other, but it is, our regulations are based on one unit accidents, not multiunit accidents. So, pending a change in current regulations, we wouldn't look at that.

COMMISSIONER MAGWOOD: Excellent answer. Thank you very much. Michelle, a couple of questions for you. Regarding the maximum safety non-coincident wet bulb temperature. My first question is do you manage to work that into casual conversation?

MICHELLE HAYES: Never. Not one.

[laughter]

COMMISSIONER MAGWOOD: The second question here, it is sort of a similar question where I asked Joe. I wondered, was there a per mash-up [spelled phonetically] analysis done of this to show what the

limit might actually be for an AP1000? Do we know how high that temperature could be before there would actually be a design issue?

MICHELLE HAYES: I did some sensitivity studies myself, and I got up to relative humidity wise, 50 percent relative humidity compared to what they have as 34 for their max, and I went up to 50, and I still did not see a discernible difference.

COMMISSIONER MAGWOOD: So, there is a considerable margin.

MICHELLE HAYES: Yes. It's not very sensitive to those. It's the container pressure I'm looking at specifically is not sensitive to relative humidity.

COMMISSIONER MAGWOOD: That's interesting. Well, that sort of begs the question, why they set the temperature where they set it, but that's sort of beyond the scope of this particular conversation. We'll look into that some other time. There is a discussion in Chapter One that relates to the impacts of construction. I don't know if there's – turn it to you. And, just a sort of broad question about that. There's a good conversation in there about how the -- there's an evaluation that looks at the impacts of construction post-construction system and components as it relates to safety, managerial or administrative controls, that sort of thing. But, there really isn't very much that gets into the impacts that the construction activity might have on operating programs at the existing site. For example, programs like, you know, emergency planning, fire protection, physical security, these are all things that, I would think, could be impact on the site-specific basis by large construction activities. Was this

looked at in any detail? I couldn't find any in the -- well, looks like you're going to get some help here.

JOSEPH SEBROSKY: Yeah. So, Earl Libby.

EARL LIBBY: Yes. Earl Libby, New Reactor Office. You're referring to construction impacts from the new unit that's being constructed on the current operating facility. There is an interim staff Guidance 22 -- Page 22 which deals with that and what is looked at.

During the COL phase, the standards proved that plan or program by the applicant licensee to go ahead and look at the influences on the operational program, specifically the safety security interface, [unintelligible] evaluations as well as emergency programs. They're all laid out in there.

COMMISSIONER MAGWOOD: Okay. So, then, make sure that I understand that. Is that something that's in this application, or is that related to the operating unit only?

EARL LIBBY: In this application is the –

COMMISSIONER MAGWOOD: In this application –

EARL LIBBY: – is the applicant's submittal, okay. Information that will be used to develop the construction impact program.

COMMISSIONER MAGWOOD: Okay. And what's that, what do they say?

EARL LIBBY: Right now, they have an engineering evaluation of construction impacts, laying out the sequence of construction events

as this potential impact on the operating units. This is how we're going to deal with it. This is how we're going to establish operational program between the two units, between the two entities, as well as how we're going to keep that plant up to date as construction proceeds.

COMMISSIONER MAGWOOD: All right. So, we don't have analysis yet, but we're going to have analysis going forward. Is that right?

EARL LIBBY: Yes, some analysis at this point that carried through from the engineering programs, yes.

COMMISSIONER MAGWOOD: Okay.

JOSEPH SEBROSKY: Excuse me. What the section in the – and, Earl, can you correct me if I'm wrong? – if you look at section 1.10 on their FSAR, in order to meet our requirements, they talk about programmatically how they would ensure that construction – and they have a bunch of equipment moving on-site, the steps that you take to ensure that the operating unit, because we've seen this with, especially with plants and outages, that the people are aware, and the appropriate notifications will be made to the operating units to ensure that they're aware of possible construction in the area that could affect the operating unit.

So, what's described in 1.10 is that a high level is the, is the programmatic elements that are put in place, and they look at different risks in ways of mitigating those risks. So, you can find that analysis in section 1.10 in the FSAR, and we evaluated, as you mentioned, it's in section 1.4 of our FSAR, but it ties back to FSAR section 1.10.

MICHELLE HAYES: Thank you, Joe. Yes, we would like to provide some supplemental response. Mr. Allan Torres, please

ALLAN TORRES: Yes. Allan Torres, and I am a sworn witness. I'm the general manager of construction for the site, for VC Summer. We did have in place in accordance with the FSER in accordance with our requirements, managerial procedures, and controls that interface with the operating unit such that as we conduct activities in the pre-construction phase, each and every one of those activities is evaluated for impact to the operating unit. Then we formally transmit to them what activities we're going to be conducting, so they can notify us of any activity on their side of the fence begins to change, such as if we happen to be working in an area that we've been approved to work on for an area such as off-site power supply. We talk with the operating unit, we get approval to be in the area. However, if something changes in the operations of the plant during that day, we have an immediate notification system such that we cease and desist any activity in that area upon notification.

So, we do have all the controls in place to do it during the pre-construction phase, for movement of heavy loads, for movement of heavy equipment, for transient of heavy loads. We will continue those evaluation processes as part of the ISG 22 requirements in the post-co phase of operation also.

COMMISSIONER MAGWOOD: Thank you. That's very helpful. Thank you very much. Thank you.

GREGORY JACZKO: Commissioner Ostendorff.

COMMISSIONER OSTENDORFF: Thanks, Chairman. Michelle, I'm going to start with you just a clarification on a comment you made to Commissioner Magwood on slide 15. You talked about the affected systems, and that you'd done some relative humidity analysis for margin, I believe, for these systems that relied upon evaporative cooling. Just, your comment to Commissioner Magwood about, you'd gone from, I think, 33 or 34 percent up to 50 percent. Was that done for all three of the systems in slide 15?

MICHELLE HAYES: No, that was just for the passive containment cooling system; that's the one we had the model of.

COMMISSIONER OSTENDORFF: Okay. Is there, were there any big uncertainties in the margins that you -- from your analysis?

MICHELLE HAYES: Of the passive containment cooling or the other –

COMMISSIONER OSTENDORFF: Any of the three.

MICHELLE HAYES: I can only -- I can speak to the passive containment cooling, and you know that there's a lot of margin in the model to begin with. There's a lot of conservatism built in to the model, and so, this is just showing that –

COMMISSIONER OSTENDORFF: Is that margin pretty well specified in the design document, or is this a Westinghouse kind of question?

MICHELLE HAYES: No. I mean, the margin is identified in the Section 6.2 of the DCD. It talks about all the conservatisms that are built into the model, the assumptions that you make, and so this

relative humidity is on top of it and that's also where some of this relative humidity is happening through the duration of the accident to make it even more [unintelligible], even though it's just that instantaneous extreme. John can talk about the other two systems.

JOHN SEGALA: Yeah. This is John Segala. For the other systems, for instance, if you look at service water and component cooling water, the 1.2 degree temperature -- wet bulb temperature effected the system water temperature by .3 degrees. So, that's how much it went up. It's -- think for component cooling water went up to like 97.3 degrees, the limit that they need to maintain below is 100 degrees. For the spent -- the normal spent fuel pool cooling system, it has to maintain it below 120 degrees that the component cooling water, which then cools that, the .3 increase so kept it well below 115, which was well below the 120 that they need to maintain it on.

So, there is margin. And then, with the chillers as well, the tonnage of the spec of the chillers was significantly greater than what they needed to remove the heat after looking at the increase in wet bulb.

COMMISSIONER OSTENDORFF: Thank you. That was very helpful. Joe, I'm going to shift over to you. On slide 22, just, I want to clarify something. Under the aircraft's hazards, there's this bullet there that says a conservative analysis using Federal Aviation Administration data, do I understand that that data is specific to this location, or is it nationwide data?

JOSEPH SEBROSKY: I'll let Dave Brown answer that question.

DAVID BROWN: This is Dave Brown. It is specific to that location. It's within a five mile radius of the plant.

COMMISSIONER OSTENDORFF: So, this is – the FAA has that database, including all civilian and military traffic that –

DAVID BROWN: Yes.

COMMISSIONER OSTENDORFF: – is covered in that?

DAVID BROWN: That's correct. We had an agreement with the FAA where we request and obtain that data as part of this evaluation.

COMMISSIONER OSTENDORFF: Okay. Thank you. Then, last, on slide 23, Joe, respect, the chemical hazards evaluation, in talks with the staff -- in your slide it says the staff performed an independent review of the certain explosion and toxic gas hazards. Can you talk just briefly about, to what extent are there any other federal agency standards used here --- EPA, Department of Homeland Security, any other regulatory problems requirements that were used by the staff, or are these strictly, is this an NRC approach?

JOSEPH SEBROSKY: I'll let Dave answer that question again.

DAVID BROWN: The standards that we use are immediately dangerous to life and health levels. Where those concentrations are available [unintelligible] chemical and they use other federal standards, [unintelligible] values for example. So yes, we do use -- [unintelligible] regulatory standards other than directed by the NRC.

COMMISSIONER OSTENDORFF: I'm just curious to what extent there's a harmonization between the NRC approach and another federal agency that has some responsibilities in this area -- I'm trying to --

DAVID BROWN: The -- really the standards we use for different purposes. For example, the [unintelligible] value would be used by the [unintelligible] determining whether the worker is appropriately -- is inappropriately exposed to a chronic chemical level. They're doing that evaluation. We're trying to evaluate whether there's a control room operator [unintelligible] be incapacitated. So, the same standards being used for different purposes by the different agencies.

COMMISSIONER OSTENDORFF: Thank you. Thank you, Mr. Chairman.

CHAIRMAN JACZKO: Any other questions or comments? Okay, well thank you very much for your presentations. We will break for lunch and reconvene at 2:00. Thank you.

(Whereupon, at 12:37 p.m., the above-entitled matter recessed to reconvene at 2:00 p.m.)

CHAIRMAN JACKO: Welcome back, everyone. We'll now begin our afternoon session with the second safety panel. This panel will focus on the remainder of Chapter 2 of the final Safety Evaluation Report, specifically in hydrology, geology, seismology, and geotechnical engineering. Also, we'll have a discussion of Chapter 3 of the FSER regarding design of structures, components, equipment and systems; Chapter 19 of the FSER on the probabilistic risk assessment and relevant sections of the application. So, again, I would just ask all the witnesses to please state their name and title for the record. And, again, we'll just start with the applicant.

AMY MONROE: Amy Monroe, licensing engineer, New Nuclear

Deployment, South Carolina Electric and Gas Company.

CHAIRMAN JACKO: Thank you.

STEPHEN SUMMER: Stephen Summer, supervisor of environmental services, SCANA Services.

ROBERT WHORTON: Robert Whorton, South Carolina Electric and Gas Company, consulting engineer.

KENNETH SEE: Kenneth See, senior hydrologist, Office of New Reactors.

GERRY STIREWALT: Gerry Stirewalt, senior geologist, Office of New Reactors.

SARAH TABATABAI: Sarah Tabatabai, [unintelligible], Office of New Reactors.

MALCOLM PATTERSON: Malcolm Patterson, reliability and risk analyst, Office of New Reactors.

CHAIRMAN JACKO: Thank you. And I'll ask if you guys can slide all the way, then we can have the applicant begin their presentations.

AMY MONROE: If we can have our slides, please? Turn to the next slide. For Safety Panel 2, a summary of the information found in the Virgil Summer FSAR, on the following topics will be provided: Hydrology, both surface and groundwaters discussed in FSAR Chapter 2.4, the site foundation characteristics that are representative for both Units 2 and 3 as discussed in FSAR Chapter 2.5, the ground motion response spectra, certified response design response spectra, and hard rock high frequency response spectra, also found in Chapter 2.5. The

seismic margins analysis found in FSAR Chapter 19.55, and other external events as described in the FSAR Section 19.58. Mr. Summer will begin the discussion of hydrology. Next slide, please? Steve?

STEPHEN SUMMER: The site is located about a mile to the south of Monticello Reservoir, which there for pool of the Fairfield Pumped Storage Facility and the source of cooling tower make up for water for Summer Station Units 2 and 3. Monticello Reservoir also provides [unintelligible] cooling water for Summer Station Unit 1. And note the locations of Summer Station Unit 1, the two and three site and the Fairfield Pumped Storage Facility.

The Broad River and Parr Reservoir, which is a dam portion of the river, runs generally northwest to southeast. Cooling tower blowdown in order to combine rate streams for Summer stations used, and three will discharge to Parr Reservoir. Next slide, please.

This slide here is the site topography. The Summer station uses 2 and 3. The site is situated on a ridge top with the design plant grade elevation of 400 feet, which corresponds to the AP1000 DCD design plant grade of 100 feet. It is approximately 135 feet above the full pool elevation of the Parr Reservoir. As can be seen from the figure, the surface water drains away from the site to the east and to the west and eventually flows to the Broad River or Parr Reservoir. This figure illustrates high flooding from the adjacent waterbodies; it is not a concern at this time. The next slide, please?

This figure presents [unintelligible] contours between [unintelligible] shallow subsurface groundwater flows away from the site

began to the east and to the west. And Mr. Bob Whorton will address the site foundation characteristics. Next slide, please.

ROBERT WHORTON: Thank you, Steve. Good afternoon. The VC Summit Site is underlain by a continent of hard bedrock, defined in Regulatory Guide 1.208. as a material with sheer weight velocity of about 2.8 kilometers per second or approximately 9,200 feet per second. The nuclear island will be constructed on the hard bedrock using a layer of high compressive strength filled concrete to establish the required design elevation for the nuclear island foundation. The non-safety-related power block structures determines annex and rad waste building, located adjacent to the nuclear island, will be founded on an imported or granular engineered backfill after removing all the native soil materials down to rock. The use of engineered backfill for these structures minimizes any potential for site-specific effects, such as seismically induced liquefaction, settlements, slope stability, or relative displacements. Next slide, please.

This slide shows the seismic design response spectra associated with the Summer COL application. This graph is a lot normal scale with acceleration shown on the vertical axis and frequency shown on the horizontal axis. The blue curve is the AP1000 certified seismic design response spectra with a peak ground acceleration of 0.30G at high frequency typically greater than 33 hertz. The shape of this curve is based on Reg. Guide 1.60 recommendations.

The green curve is the Summer ground motion response spectra, which was developed through the probabilistic seismic hazards analysis

process in accordance with Regulatory Guide 1.208, with a peak ground acceleration of 0.23G at 100 hertz. As shown, the green curve exceeds the blue curve at frequencies of approximately 17 to 80 hertz in a horizontal direction. The vertical direction had similar exceedences. The red curve is the AP1000 hard rock high frequency response spectra, which was developed by Westinghouse to bound the first three hard rock site COL applications and to address high frequency exceedences above their certified design. These high frequency exceedences were evaluated and documented in DCD Appendix 3I and found to be acceptable to the NRC staff. Next slide, please?

On seismic margins, the site-specific seismic margin analysis is addressed in FSAR Section 19.55.6.3. The site seismic demand based on the site-specific ground motion response spectra is enveloped by seismic demands, which combines both the certified seismic design response spectra and the hard rock high frequency design response spectra as defined by the Tier-1 criteria for the safe shut-down earthquake. Therefore, the seismic margin assessment analysis and the AP1000 design control document bounds the VC Summer Site. Next slide, please.

The high confident low probability of failure is addressed in FSAR Section 19.59.6.3. The VC Summer nuclear island is founded on hard-sound rock, which eliminates any potential for site-specific effects, such as seismically induced liquefaction, settlements, slope stability, foundation failure, or relative displacements, which would lower the high confident low probability of failure values, which were

calculated for the certified design. For the non-safety-related structures on foundations, which are adjacent to the nuclear island, these site-specific effects are evaluated in FSAR Section 2.5.4 and shown to have no effect on the nuclear island, therefore having no potential to lower the high confident low probabilities of failure values, which were calculated from the certified design. Amy Monroe will continue with the next slide.

AMY MONROE: The external events identified for evaluation included high winds, external flooding, various forms of transportation accidents, other nearby facility accidents, and wildfires. FSAR Table 19.58-201, documents the site-specific external events evaluations that were performed for the VC Summer Units 2 and 3. This table with that is to the FSAR based on an NRC staff request for additional information that specifically requested that supporting information be included in the FSAR to document that all the site related assumptions in Chapter 19.58 external events analyses were valid for the VC Summer site. This table provides a summary of the determination of the applicability of each event to the site and a general explanation of the applicability evaluation. It also provides a pointer to the FSAR Section that gives us the details of the specific evaluations that were performed for each unit.

The table documents that the evaluations performed for the VC Summer Units 2 and 3 site are bounded by the high winds, floods, and other external events analyses documented in the AP1000 DCD, GRA Section 19.58 and no additional evaluations are required.

Commissioner Svinicki, in the last panel, you asked me about the definition for what was probabilistically insignificant, prior to providing you that response, I wanted to verify on that application that I had my value correct. But I did confirm that for the purposes of hazardous evaluation, it's considered probabilistically insignificant if the event frequency of less than 10 to the minus 7. Thank you.

CHAIRMAN JACKO: Thank you.

AMY MONROE: That completes it.

CHAIRMAN JACZKO: We'll hear from the staff now.

KENNETH SEE: Good afternoon. My name is Ken See. I'm a senior hydrologist with the Office of New Reactors. I am the lead technical reviewer for Section 2.4 of the VC Summer COL application. During this panel discussion, I will present highlights from the staff's evaluation of the Summer application related to hydrology. Dr. Gerry Stirewalt and Sarah Tabatabai will present highlights of the staff's evaluation related to geology and seismology. The presentation will end with Malcolm Patterson presenting highlights from the staff's evaluation for the seismic margins analyses and external event frequencies. Next slide, please. Thank you.

As part of our review, the staff reviewed the flooding mechanisms and scenarios identified by the applicant in the FSAR. Additionally, the staff postulated various other mechanisms in some areas that may generate large floods at or near the site. This slide identifies the approximate locations of major surface water features at the river site that are impacted by various postulated flooding

mechanisms along with the associated flood or water surface peak elevations. The staff performed confirmatory analyses on the flood scenarios proposed by the applicant, such are the local site flooding, due local intense precipitation, the probable maximum flood for the Broad River and nearby reservoirs and the hypothetical breaching of upstream dams.

After conducting the review, the staff agrees with the applicant that the design basis flood is that flood caused by the local intense precipitation as described in Section 2.4.2 of the FSAR. The fact that the design basis flood for this site is that caused by the local intense precipitation, is not unusual.

Additionally, the amount margin associated with the local intense precipitation, in this case, 0.6 feet, is typical for a site. In addition to the breach scenarios performed by the applicant as part of our independent review, the staff also considered the possibility of breaching the [unintelligible] between Monticello Reservoir and Mayo Creek, causing a flood in Mayo Creek to the east of the proposed site. [unintelligible] values used in the analysis were obtained from the Bureau of Reclamation Dam Safety Office documents. But these values were then increased for additional conservatism. The flood level near the site for this scenario is approximately 392 feet, approximately 7-1/2 feet below the design basis flood and 8 feet below the site grade of 400 feet.

In summary, based on the staff's review of various flooding mechanisms, such as the local intense precipitation, the probable

maximum flood, the dam breach scenarios, the staff found that the proposed site is a dry site and no flood protection is required. Next slide, please.

The staff hydrology review also included characterization of the site and groundwater system. Verificatioin of the site maximum operational groundwater levels and analyses of potential impacts of the postulated accidental effluent release on nearby water users. As depicted in the conceptual model on the left, there are two groundwater-bearing zones at the site. The upper zone is composed the soil, saprolite [phonetic], which is the sand and cloudy remnants of weathered rock, and shallow bedrock. Beneath this lies a deeper bedrock zone when water-bearing fractures that pinch out with depth. [unintelligible] primary within the saprolite and shallow bedrock unit because it's considerably more conductive than the deeper bedrock. Monitoring daily indicates that groundwater flows away from the ridge top where Units 2 and 3 will be constructed and discharges to either Mayo Creek or Parr Reservoir, which border the site.

Staff determined that construction changes will decrease on-site and filtration and keep post-construction maximum groundwater levels at or below 380 feet. This is 18 feet below the DCD maximum groundwater elevation. The staff also analyzed the potential impacts of the worst case accident effluent release at nearby off-site portable water resources. These are guidance from Standard Review Plan, Section 2.4.13 and Branch Technical Position 11-6. This guidance provides the source term flow pass parameters and receptor locations for this

analysis to be conservatively representative of site and design characteristics and result in the most severe impact on water supplies or users.

The staff determined considerate estimates of site-specific flow in [unintelligible] parameters and reviewed the bounding set of potential flow paths presented by the applicant, which are depicted by the red lines on the right figure.

Based on-site characteristics, the staff concludes that the most probable flow path from Units 2 or 3 was the less through the saprolite and shallow bedrock and into one of the unknown creeks which flow into Parr Reservoir. Other flow paths from Units 2 and 3 were evaluated, including flow to a hypothetical private well on the eastern site boundary. This flow path was found not to be probable because groundwater would have to flow through bedrock beneath Mayo Creek and against vertical gradients to reach this location.

During the staff's confirmatory analysis of flow and transport calculations, additional conservatism was included in estimates of parameters affecting flow velocity, contaminant decay, absorption, and dilution in order to create worse case concentrations at potential receptors. These conservative changes resulted in larger concentrations at receptor locations. Despite this, concentrations at potential receptor locations resulting from these bounding accidental effluent release scenarios, do not exceed concentration limits required by 10 CFR, Part 20, Appendix D. This concludes my part of the presentation. Dr. Stirewalt will now present his findings regarding the

site geology.

GERRY STIREWALT: Thanks, Ken. I am Gerry Stirewalt, senior geologist in the Office of New Reactors. I was a lead reviewer for the safety review of Summer FSAR sections 2.5.1 and 2.5.3. The primary goal of my review was to ensure that the geologic features found in the site region, the site vicinity, the site area, and the site location were adequately characterized for assessing the presence or absence of capable tectonic features and potentially non-tectonic features, both of which may result in geologic hazard at the site. Capable tectonic features defined as tectonic features of quaternary age, that is 2.6 million years of age to the present, specifically includes tectonically induced faulting, which may result in geologic hazard of the site due to induced seismically or surfaced at displacement. My first slide, please.

This slide shows the locations of 14 potential quaternary tectonic features postulated to occur in the site region based on data compiled by the U.S. Geological Survey. Quaternary-aged features are of primary importance because, as previously stated, they may represent capable tectonic structures. Such structures, if they are present, would require detailed assessment in regard to their potential for seismicity and surface all displacement based on 10 CFR 100.23.

Now, the only definitive that is capable tectonic features in the site region are associated with seismically induced paleoliquefaction in the Charleston, South Carolina area. The locations of these paleoliquefaction features are shown in this slide by the three

red triangles along the South Carolina Coast. They were generated by seismic shaking of saturated sediments causing liquefaction during the 1886 and the pre-1886 earthquakes which occurred in the Charleston area. Sarah will discuss Charleston area seismicity in her presentation.

Based on detailed technical review of the FSAR, independent review of references citing by the applicant and considerable practical knowledge of regional and site-specific geology for the Summer site, we found that no definitive geologic field evidence exists to indicate any of these features represent capable tectonic structures that require further assessment other than the Charleston area. We documented that relative age relationships proves the features of pre-quaternary in age are some of the faults, while individual fault characteristics proves the features of pre-quaternary for other of the faults.

In a subsequent slide, I'll illustrate the concept of applying relative age relationship to determine that the tectonic feature is not a capable tectonic structure. Next slide, please.

This slide shows the locations of the specific tectonic features postulated to occur in the site vicinity. Based on detailed technical review of the FSAR, again, independent review of references cited by the applicant, and direct field examination of certain faults mapped in the site vicinity during site-audit visits, we found that no geologic field evidence exists to indicate any of these features are capable of tectonic structures.

Now, I'd like to take you on a field trip to examine one of these faults. That's showing in the figure to help document a pre-

quaternary age for that fault. I call your attention to the Wateree Creek Fault, located 3 kilometers south of the Summer site. And next slide, please.

This slide showed a road cut that provides a cross section view of the Wateree Creek Fault, which juxtaposes weathered metamorpho [phonetic] sedimentary rock on the left side and weathered igneous rock on the right side across a very sharp line. The rocks, by the way, are greater than 251 million years old.

This line, the contact between those two different rock types, marks the steeply dipping fault surface. At another location along the map length of this same fault, an igneous dyke with an age of 144 million years old cross-cuts the fault without displacement. That field observation limits the age of last displacement on the Wateree Creek Fault documenting that it's much older than quaternary and not a capable tectonic feature. Next slide, please.

This slide specifies exactly what was done by NRC geologist during the field examination of foundation grade level bedrock in the units to excavation to document that no capable tectonic features occurred in that excavation. During site audits in August 2010 and April 2011, we directly examined rock units and geologic structures mapped by the applicant in foundation level bedrock of the Unit 2 nuclear island excavation as well as the actual geologic maps that were produced. We found that the FSAR descriptions -- pardon me -- of site location geology and tectonic structures were fully consistent with our field observations and that no capable tectonic structures occur in the

foundation bedrock exposed in the Unit 2 excavation. Based on results of those detailed field examinations, we determined that a geologic mapping licensed condition is not needed for Unit 2. The staff does propose a geologic mapping license condition for Summer Unit 3 because of rock types and geologic structures and foundation bedrock of the Unit 3 excavation have not yet been examined by NRC geologists.

As documented in the FSAR -- FSER, I want to clearly state that after reviewing the site characterization information presented in the FSAR, the staff found the application meets all NRC requirements related to basic geologic and seismic information and surface faulting. The staff proposes the geologic mapping license condition of the Unit 3 to confirm the conclusions drawn in the FSER. Well, why? Because the potential for a current sub-detrimental [phonetic] geologic features in foundation rock enriched underlying the nuclear island exists for virtually every geologic setting when both tectonic and non-tectonic features are considered. Such features may not be exposed at the ground surface and could be missed during site region, site vicinity and site area geologic investigations. The standard approach for documenting their presence or absence at the site location is geologic mapping of foundation rock units.

Let me take you into Unit 2 excavation and show you how geologic field observations were actually used to draw conclusions about age of faulting in the excavation.

This slide illustrates a minor sheer zone mapped by the applicant in the Unit 2 foundation bedrock. The feature was initially

under more than 10 to 15 meters of weathered rock and was not exposed at the ground surface. The sheer zone, marked by strong, closely spaced fractures, passes from the bottom to the top of the image. It is a tectonic feature for sure, but relative age relationships, clearly indicate the structure is very old and not a capable tectonic feature. I'd like to explain the logic a bit further.

The rock in which the sheer zone occurs, is an igneous intrusive body that's about 307 million years old. That's the regular metric age date by the way. Two igneous intrusive veins that cost-up the sheer zone without displacement, marked by arrows in that slide, are also around 300 million years old. Well, because the old veins are not offset by the sheer zone, the age of last movement pre-dates the veins and therefore, is much older than quaternary. This example simply shows how relative age relationships can be used to document that a geologic structure is not a capable tectonic feature.

Okay, now, since we can't visit the site, I am providing for your examination, both core and hand samples of the two primary rock types comprising foundation bedrock of Unit 2. Photographs these samples were admitted as staff Exhibits 14 and 15 previously. Both rock units are intrusive igneous bodies that are about 307 million years old. A lighter-cored rock, Exhibit 15, is a granitic in composition, the darker-colored rock, Staff Exhibit 14, simply contains more iron and magnesium minerals. Both the core and the hand samples document the quality of the unit to the foundation rock units.

And, now, I've already discussed the evidence that more

capable tectonic structures exists at the site location. The foundation units also are not subject to non-tectonic deformation, such as dissolution or sustenance due to groundwater withdrawal.

CHAIRMAN JACKO: I'm going to interrupt you for just a moment.

GERRY STIREWALT: Yes, sir.

CHAIRMAN JACKO: And I'm going to -- somebody who may know about it, are we admitting these as exhibits?

FEMALE SPEAKER: [INAUDIBLE].

CHAIRMAN JACKO: Okay, so we have photographs? Okay.

GERRY STIREWALT: I would hate to give up my rocks.

[laughter]

GERRY STIREWALT: Mr. Chair. Thank you. Thank you. All right, next slide.

CHAIRMAN JACKO: Then you're safe.

GERRY STIREWALT: Thank you. Next slide? Okay, again. Back to the excavation to show you that you that NRC geologists carefully examine potential tectonic features. In this slide, a geologist is, in fact, examining a plainer [spelled phonetically] fracture uncovered in the Unit 2 excavation specifically for field evidence of fault displacement. The fracture, again, is a tectonic feature. Exhibits no evidence of fault displacement. Starts ground truthing is essential for documenting that no capable tectonic structures occurred in the excavation. Same procedure implemented for the Unit 2 excavation, that is, direct examination of the maps produced by the applicant and direct

examination of the actual geologic features mapped in the field will be applied for Unit 3 in connection with the proposed geologic mapping licensed condition.

This slide ends my presentation, thank you. Sarah will begin her decision of section 2.5.2 with the next slide.

SARAH TABATABAI: My name is Sarah Tabatabai. I'm a geophysicist in the Office of New Reactors, and I was the technical reviewer for Section 2.5.2 of the Summer COL application.

Our review of Section 2.5.2 mainly focused on ensuring that the applicant adequately updated the seismic source model for its probabilistic seismic hazard analysis, or PSHA. The most significant seismic source affecting the Summer site is the Charleston seismic source. The applicant updated the 1986 EPRI Charleston seismic source model with an entirely new model, which was based paleoseismic data.

The paleoseismic data for the Charleston region is based on field evidence of historic and pre-historic earthquake-induced liquefaction features. The predominant liquefaction features identified in the Charleston region are sand craters and sand dykes. These features were identified, evaluated, and dated in order to assess the earthquake potential for the Charleston region. The new Charleston seismic source model was originally presented in the site safety analysis report for the Vogtle ESP site. And we reviewed it extensively as part of our review for the Vogtle ESP. So next slide, please.

The map in this slide shows the Summer site, which is depicted by the red star. It also shows the new Charleston seismic

source model, which is located to the southeast of the site. The model is represented by four mutually exclusive source zone geometries shown by the red, blue, and two black rectangles in order to represent uncertainty in the location of the Charleston source zone.

The geometry depicted in red was considered the most likely hypothesis for the location of future Charleston type earthquakes; and therefore was assigned a weight of -- in the model of 0.7. This red area was considered the most likely source because it contains the largest supported ground motion found the 1886 Charleston Earthquake. It's the area of ongoing concentrated seismicity and the area of the greatest density for the 1886 and prehistoric liquefaction features.

The three other geometries were considered to be less likely hypothesis, and, therefore, were each applying weights of 0.1 in order to capture the uncertainty that future events may not be restricted to that geometry in red.

In my next slide, I will talk about the Eastern Tennessee seismic zone, which is located approximately 175 miles to the northeast of the Summer site and it corresponds to the seismicity plotted in the upper left corner of the previous -- the figure shown in the previous slide.

The applicant did not include any of the newer Eastern Tennessee seismic source zone information that post-dates the 1986 EPRI study in its PSHA for the site. Specifically, two more recent studies have an excellent magnitude distributions that are slightly higher than what the 1986 EPRI model specifies. Because of this, we asked the

applicant to address this new information. In response, the applicant referred to a recent sensitivity study that was conducted in 2008 by the Nuclear Energy Institute for the Eastern Tennessee Seismic Zone.

The study showed that for a hypothetical site located in the Eastern Tennessee seismic zone updating the 1986 EPRI model maximum magnitude values did not significantly affect the hazard. We also performed our own sensitivity analysis for the actual Summer site and found that increase in the maximum magnitude distribution does not significantly affect the ground motion or response sector at the Summer site.

This slide ends my presentation for FSAR Section 2.5.2. I will now discuss the comparison of the Summer ground motion response spectra with the AP1000 certified design response spectra which was reviewed as part of Chapter 3. Next slide, please?

The Summer ground motion response sector, or GMRS, represent the free-field surface motion at the elevation of the nuclear island base mat. The bedrock at the base mat elevation has a sheer weight velocity that exceeds 9,000 feet per second. So it's classified as a hard rock site. In this slide, the Summer horizontal GMRS is shown by the blue dash curve. The red curve corresponds to the AP1000 certified designer response spectra, or CSDRS, which represents seismic demand to which the AP1000 standard design is based. If you compare the horizontal GMRS with the AP1000 CSDRS, you can see that it exceeds CSDRS of frequencies from 15 to 80 hertz. However, I'd also like to point out the black curve plotted in the figure, which envelopes the Summer GMRS

at every frequency. This black curve corresponds to the AP1000 hard rock high frequency response spectra which represents the high frequency seismic demand characteristic of the Central and Eastern United States. Westinghouse used this high frequency seismic demand as input to detailed analyses, which demonstrated that hard rock high frequency ground motions result in small displacements and are, therefore, non-damaging to safety significant structures, systems, and components.

Staff performed a detailed review of the Westinghouse analysis methods and found them to be in accordance with staff guidance. Staff also performed confirmatory analysis to ensure proper implementation of seismic modeling parameters. As a result of the seismic design analysis, which was reviewed, audited, and verified through confirmatory analysis, the staff concluded that the AP1000 standard design is acceptable for the Summer site.

In the next slide, Malcolm Patterson will begin his presentation on PRA and severe accidents.

MALCOLM PATTERSON: Good afternoon, Mr. Chairman and commissioners. I'm Malcolm Patterson. I'm a liability and risk analyst in the Office of New Reactors. For VC Summer, I was the lead technical reviewer in the area of PRA and severe accidents.

As you heard this morning, actual hazards specific to the Summer site were evaluated in the staff's review of FSAR Chapters 2 and 3. For the most part, these are deterministic analyses.

In Chapter 19, we looked at the same site and the events but from a risk perspective. We recognized that rare events might also lead

to core damage. Because the CDF for AP1000 internal events add power and so low -- it's less than 3 tenths and to the minus 7 -- external events could be quite rare, but still represent a significant fraction of total CDF.

First, I'll talk about earthquake risk. The applicant must perform a plant-specific seismic margin analysis unless they can show that the SMA of the certified design applies to their plant. Could we go back to the previous slide, please?

To certify a design or grant a license, the staff requires a PRA-based seismic margins analysis using PRA techniques to identify the equipment needed to shut down the plant after a seismic event. It's a margin analysis because we demand a safety margin, a cushion beyond the design basis. This margin is important because there's a very large uncertainty about how much shaking a particular quake is going to cause on a given site. Previous slide, please.

As Sarah explained, the red line represents the CSDRS for AP1000. That's the safe shut down earthquake, or SSE for the original certified design. When we say that the SSE is a .03G quake, but that's really a form of shorthand. We really mean a frequency distribution that has the shape of the CSDRS pegged at that little green dot at the right side of the figure. The review level earthquake is 1-2/3rds times the SSE. So we say that the RLE is a .5G earthquake, and it has the same shape as the CSDRS, but is pegged at the higher peak acceleration.

Applicants ensure that SSEs needed to shut down the plant have the seismic capacity to withstand the RLE with a high confidence in

low probability of failure, which we call the HCLPF value.

The DC Amendment, confirmed with the AP1000 seismic design and seismic margins analysis, would apply to a wider variety of sites, including hard rock sites with high frequency spectra, like, Summer. The HRAF curve is shown in black on this slide, and it completely bounds the Summer GMRS all the way to 100 hertz. In the safety evaluation from the DC Amendment, the staff concluded that the DCD seismic margin analysis would apply to each of the five new profiles in the -- ranging from soft soil to hard rock high frequency. So, because the HRAF curved bounds the Summer GMRS, and staff included to the generic SMA covers the Summer application.

It's important to note that the hard rock high frequency curve exceeds the CSDRS at higher frequencies. To expand the seismic margin envelope in this way, the DC Amendment effectively raised the bar for type-testing in electrical equipment that may be sensitive to high frequency input. Next slide, please.

In addition to seismic events in local geology, AP1000 COLs must address high winds, flooding, fire, transportation accidents, and nearby facilities to see if any contribute to total plant risk. Westinghouse took the approach of polling the potential COL applicants to select the most limiting external events of each type. This meant that in most cases, the COLs were bounded by the DCD.

The regulations require some are to describe the PRA and its results, which includes, of course, risk from external events. The staff required each COL applicant to provide a site-specific supplement

describing the characteristics of proposed site from a risk perspective. This allowed the staff to make an independent assessment of the screening analysis that had been performed. Moreover, if site characteristics change, the appropriate review will be triggered as the FSAR is updated.

For AP1000 COLs, the ground rules are specified in the DCD. If an event is more frequent than 1 times 10 minus 6 per year, the plant must be designed to cope with it. If the Summer events magnitude and frequency are bounded by the generic site, the contribution to risk, if any, is already reported in the DCD. No additional information is needed in the FSAR. In general, high winds fall into this category. They can contribute less than about 1 percent to the reported CDF.

Some transportation accidents can't damage the plant at all, as we heard this morning. You can see from that figure that the closest major road is more than a mile away from the plant, the nearest rail line is more than three miles from the plant. So the deterministic analysis in the earlier chapter showed that this is beyond the stand-off distance where explosions could damage the plant or releases could incapacitate control of the operators.

If event frequency is less than 10 to the minus 7 per year, it's too unlikely. It won't increase total risk significantly. For example, the nearest airway passes about two miles from the site. But because of the level of traffic, accident aircraft impact were screened in this way. If an event is more frequent than 10 to the minus 7 per year, then it's contribution to CDF must be calculated. If this delta

CDF is less than 1 times 10 to the minus 8 per year, its consequences are negligible. The CDF itself is a very uncertain number, and many such events could be added without changing the result in a meaningful way.

If an event is not screened from further analysis by one of these criteria, the contribution it makes to total plant risk must be reported in the FSAR. However, all of the external events considered for Summer were screened. Next slide, please.

This table shows how. The three middle columns correspond to the three criteria I just described. The events in each row are evaluated separately, although, within the category of external flooding, for example, multiple contributors to high-water level are considered simultaneously when that makes sense.

In short, the applicant addressed all external events when applied the Summer Units 2 and 3 and provided a sufficient basis for screening these external events from further analysis.

This concludes the staff presentation for this panel. I look forward to your questions.

CHAIRMAN JACZKO: Well, thank you. A couple of questions. First off, just on the tectonic features, and you'll have to give me a short --

GERRY STIREWALT: Yes, Mr. Chairman?

CHAIRMAN JACZKO: -- course on this. Why is it relevant that there has not been a displacement for 300 million years?

GERRY STIREWALT: Because the criteria for determining a

structure is capable is cut off at quaternary. So if it's very, very much older --

CHAIRMAN JACZKO: But what's the scientific basis for that value? I mean, why is 250 million years, is that the -- is that what a --

GERRY STIREWALT: It takes a long time.

CHAIRMAN JACZKO: What's that?

GERRY STIREWALT: [inaudible]

CHAIRMAN JACZKO: No, 300, whatever the cutoff is, why is it 300 versus 350? I mean, is there some --

GERRY STIREWALT: Well, that was just the example I gave.

CHAIRMAN JACZKO: Oh.

GERRY STIREWALT: And it's the fact that those rocks were dated at that age, so that's why that particular number was bandied about in this case. There is no -- again, as long as it's older than quaternary.

CHAIRMAN JACZKO: So why does that matter? I mean, there a --

GERRY STIREWALT: Well --

CHAIRMAN JACZKO: -- body of evidence that says that structures that have not exhibited tectonic movement of --

GERRY STIREWALT: Yes, in our --

CHAIRMAN JACZKO: -- features before that long will never --

GERRY STIREWALT: -- in our regulations, it's defined that quaternary, if it's quaternary in age, we have to consider it as

capable.

CHAIRMAN JACZKO: Okay, okay.

GERRY STIREWALT: Yes, sir. Yes, sir.

CHAIRMAN JACZKO: And again, and maybe this gets to who's in our regs and maybe you can explain that to me, but as a geologist, why is that time period relevant? Like, why do you think that number shows up in our regs?

GERRY STIREWALT: Because that number goes from 2.6 to the present day. So it could, in fact, be an active fault displacement at a site, which could be either seismically problematical or surface fault displacement. So that goes up to the recent. And that's just sort of a geologic bracket for that timeframe. But it includes recent, which means active faulting.

CHAIRMAN JACZKO: So, and maybe I'm not asking this in the right way, so earlier than that, it's just not going to happen, is that the -- is that -- if it's older than that and it hasn't moved, it's just never going to move? Is that the basis?

GERRY STIREWALT: No, the likelihood is much, much less if it's older than quaternary.

CHAIRMAN JACZKO: Okay, so that's -- so it is.

GERRY STIREWALT: So that you're going to have repeated motion.

CHAIRMAN JACZKO: Okay, yeah, that's what I was trying to get at.

GERRY STIREWALT: Yeah. Sorry, I got carried away, perhaps.

CHAIRMAN JACZKO: No, that's fine. I'm by no means an expert in this, so I -- but that's the point. So beyond that, I mean, there's good --

GERRY STIREWALT: Yes, sir.

CHAIRMAN JACZKO: -- there is data or --

GERRY STIREWALT: Yes, sir.

CHAIRMAN JACZKO: -- physical basis for movements --

GERRY STIREWALT: That's correct.

CHAIRMAN JACZKO: -- okay. That's -- thank you. The, and this is maybe more of a regulatory question for anyone who wants to answer, well, maybe again for you, Mr. Stirewalt, why is Unit 3 not yet mapped? Why is it something we have a licensed condition for and don't -- is it something that should have been part of the application?

GERRY STIREWALT: Well, it is not yet mapped because they are not currently at foundation grade level. There's a process that they go through when removing the saprolite 20 or 30 or 40 meters, getting down to sound, solid rock, but then they do a level of control blasting, mind you, no-blast damage is a concern. But then they get down to the actual foundation grade level, and they aren't there yet. That's why it hasn't been done. It will be done. It has not been done, and that's the reason.

CHAIRMAN JACZKO: Okay.

JOSEPH SEBROSKY: This is Joseph Sebrosky. I'm the safety PM for Summer, and I have been sworn. To address your question, they are doing the excavation. They don't have a license yet. They're doing it

in accordance with 5010, and it's considered a pre-construction activity. The requirements of our review of Chapter 2 is to provide us with enough FSAR information in order for us to make a judgment, and that's done using borings and also other field evidence that Gerry looked at.

CHAIRMAN JACZKO: And that has been done for Unit 3?

JOSEPH SEBROSKY: Yes.

CHAIRMAN JACZKO: Okay.

JOSEPH SEBROSKY: So that's the basis for us --

CHAIRMAN JACZKO: Okay.

JOSEPH SEBROSKY: -- granting the license. The geologic mapping is a confirmation. And as Gerry --

CHAIRMAN JACZKO: Okay.

JOSEPH SEBROSKY: -- explained earlier, you have more data available to you. So but we are basing our license and the FSAR information.

CHAIRMAN JACZKO: And that's on the borings that were done?

JOSEPH SEBROSKY: That's on the borings and also it relied on Unit 1 excavation observations and also observations of the geology in the general area. Like as Gerry indicated, field evidence, those pictures that Gerry has of geologic features that are in the area.

CHAIRMAN JACZKO: Thank you, that's very helpful. I appreciate that.

Turning to the frequency response spectrum, GS-191 will present, I think as I understand, yet another frequency response

spectrum, is that correct?

SARAH TABATABAI: Yes, it's an updated seismic source model for the Central and Eastern United States.

CHAIRMAN JACZKO: It is a significantly different from what we see from the response spectrum that's here for Summer or the hard rock?

SARAH TABATABAI: Well, for Summer, it's very close to the Charleston seismic source. And between the model that the applicant used for their Charleston source and the new model that's coming out, there's no fundamental differences. There's some small differences, but nothing major that would result in any big differences. And that dominates the hazards so we don't expect overall there to be big changes in the GMRS.

CHAIRMAN JACZKO: It is -- will it still be bounded by the high frequency spectrum, the hard rock high frequency spectrum?

SARAH TABATABAI: I can't say for sure. I haven't quantitatively looked at the new model and made a comparison, but I would -- there's not going to be any big differences, especially, at high frequencies, we don't expect any big changes.

CHAIRMAN JACZKO: Okay.

SARAH TABATABAI: So.

CHAIRMAN JACZKO: If there were differences, what would be the issues?

SARAH TABATABAI: Well, first of all, we would get the new model, we'll make a comparison with the two GMRS spectra.

CHAIRMAN JACZKO: [affirmative]

SARAH TABATABAI: And then depending on how significant -- depending on the differences, we'll decide what -- how to approach that.

CHAIRMAN JACZKO: Yeah.

SARAH TABATABAI: Maybe with SSI or --

CHAIRMAN JACZKO: Do we have the new GMRS from the new USGS data now? Do we --

SARAH TABATABAI: You mean the new CES [phonetic] model?

CHAIRMAN JACZKO: Yeah.

SARAH TABATABAI: It's being reviewed, so --

CHAIRMAN JACZKO: Okay.

SARAH TABATABAI: -- by the NRC.

CHAIRMAN JACZKO: Okay, so we --

SARAH TABATABAI: It hasn't come out yet. Yeah. It hasn't officially been --

CHAIRMAN JACZKO: Okay, but we do have it?

SARAH TABATABAI: It's being reviewed, yes.

CHAIRMAN JACZKO: By the NRC or by the USGS or somebody else?

SARAH TABATABAI: By the NRC

CHAIRMAN JACZKO: Okay.

SARAH TABATABAI: Is one of the reviewers.

CHAIRMAN JACZKO: Okay. Thanks.

I have to turn to a slightly different topic. The -- and this is something I test on a little bit, I think, with the -- during the Vogtle. But I have some similar questions. We do have a licensed

condition requiring the licensee review -- the differences between the as-built plant and the design used for the AP1000 DCD and the PRA, is there some kind of condition that requires the licensee to use the as-built PRA or what exactly do they use then to actually term or to do the analysis that we asked them to do with the PRA?

MALCOLM PATTERSON: We'd require them to have a plan-specific as-built PRA prior to fuel load.

CHAIRMAN JACZKO: So is it possible that will add, I mean, is it possible there could be a difference with the as-built PRA that might cause that or change equipment that would be considered significant from the PRA perspective?

MALCOLM PATTERSON: For AP1000, that seems very unlikely to me, but in theory, yes, that could happen.

CHAIRMAN JACZKO: Okay. And as we go forward, what is the process then for confirmation of the acceptability of the PRA? We don't -- we require them to submit a summary but not the PRA itself as part of their application. So do we ever audit or review the PRA, or is that something that is done through peer review process or?

MALCOLM PATTERSON: We will have the opportunity to visit the applicant -- or the licensee then and audit the PRA, but it's not written that we will do so.

CHAIRMAN JACZKO: Yeah.

MALCOLM PATTERSON: We do rely very heavily on the peer review process. The requirements are codified and it is a very rigorous process. So assuming that it is executed reasonably well, we'll have

high confidence in the PRA results that they use.

CHAIRMAN JACZKO: So has they're PRA been peer reviewed already?

MALCOLM PATTERSON: No, no.

CHAIRMAN JACZKO: Oh, because it'll happen after the --

MALCOLM PATTERSON: Well, one of the requirements for the peer review is that it fully complies with the code is that you use people who are operating the same kind of plant, and we don't have any of those just yet.

CHAIRMAN JACZKO: So we won't be able to peer review the PRA until the plant's built and operating?

MALCOLM PATTERSON: Well --

CHAIRMAN JACZKO: Or two Vogtles built in then?

MALCOLM PATTERSON: We won't be able to comply with that specific requirement of the code, but --

CHAIRMAN JACZKO: But they do intend to do a peer review prior to that?

MALCOLM PATTERSON: Yes. And, in fact, the members of the design center have already planned the kinds of upgrades they expect to see in the plant-specific PRA for fuel load.

CHAIRMAN JACZKO: Okay, thank you. Commissioner Svinicki.

COMMISSIONER SVINICKI: Thank you all for your presentations. My first question is directed to some witness of the applicant. From examination of the safety evaluation report, it looks like there was a significant effort in development or preparation of the probabilistic

seismic hazards analysis. Could an applicant witness just take a moment or two and describe the analysis in terms of, I don't know a better term than kind of "State-of-the-art" or "Cutting edge" where the analysis tools and techniques that were used, where you're working on the advanced edge of knowledge in terms of probabilistic seismic hazards analysis and a metric that might help characterize it as well as how many analysis hours or labor hours do you think were spent in development of this analysis?

ROBERT WHORTON: Bob Whorton, South Carolina Electric and Gas. I don't know if I can answer the number of man hours that went into the development of the final product, the GMRS. However, for the first part of your question, the probabilistic seismic hazards analysis used at the time of the application of the COL application, used the state-of-the-art technology, which was then the 1989 EPRI seismic source characterization model. There's another part of that. You have to have a ground motion attenuation model. And at that time of the application, we used the EPRI 2004-2006 update attenuation models. Those two models are put together in the PSHA process in order to develop the seismic hazard at the site, and then you have a conversion from that, the uniform hazard, and then a subsequent conversion to the ground motion response spectra. So at the time of the application, we used state-of-the-art.

Now, at that time, though, we did update the seismic source characterization model from Charleston based on the latest technology, as Sarah mentioned the updated Charleston models were incorporated into

that. We did assess the effects, supplement sensitivity study of the Eastern Tennessee seismic zone. We also relooked at the updates to the New Madrid, Missouri seismic area. As it turned out, Charleston is the dominating component to your probabilistic seismic hazard. And from that, New Madrid being more than 500 miles away, it really played no contribution into the hazard. The eastern Tennessee zone did not have any significant impact.

COMMISSIONER SVINICKI: That description is helpful. Would it be problematic or difficult to give or provide later an estimate of just a rough order of magnitude of the amount of labor hours or the full-time work that went into that? Is that something you could provide? Just and it just has to be an order of magnitude estimate.

ROBERT WHORTON: I don't think we've looked at it in that detail at this point --

COMMISSIONER SVINICKI: Okay.

ROBERT WHORTON: -- but we can do that.

COMMISSIONER SVINICKI: The remainder of my questions are for the staff. Gerry, you know I -- and I really appreciated your presentation, and I sometimes think of the mandatory hearing and the findings we have to make as the Commission must assess, whether or not we turned over every rock. And it turns out that I met the guy --

[laughter]

-- I met the guy today who turned over every rock. So thank you.

On a more serious note, where there's been some discussion of

the proposed license condition for Unit 3 regarding the geological mapping, as a non-practitioner in this field -- well, first of all, your testimony, I think you characterized that you view the condition, the license condition, it would be a validation step, really, that it would be staff's expectation that they could validate what they believe will be found there when the geologic mapping is done.

GERRY STIREWALT: Correct.

COMMISSIONER SVINICKI: I interpret that to be that you would not anticipate finding something that would be truly novel or unique there given that these units are proposed to be side by side or adjacent to each other. But can you give me a sense as of experience field practitioner in this area, what would be the likelihood of finding something that would be, you know, unexpected there when you do that geologic mapping. And I don't mean by a number, I just mean kind of your broad field experience. Is that -- is it your assessment that it's a low probability upon conducting that geologic mapping, you'd find something that would truly make that geology differentiate itself from the adjacent proposed site?

GERRY STIREWALT: Well, that's a good question. I'm glad to get it, actually. Because, in fact, it really -- probability depends actually on geologic setting. If you're in an area that's more active tectonically, simply speaking, I mean, good or bad, the probability is higher. I mean, I've worked in Asia in an exact setting that's just like Japan, for example. Guess what? Quaternary faulting was a key issue. So it really -- it's really geologic-setting dependent. In the

southeast, these are relatively old and stable rocks, and it's very unlikely that we're going to find something there. So but it really -- probability goes up when you get in the areas that are more active tectonically, which is, again, just a simple fact of field geology.

COMMISSIONER SVINICKI: Okay, thank you. That's helpful. And again, I just wanted that broader sense of what you expect there.

Question regarding the hydrology review and assessment. And I appreciated I didn't make a note of what staff slide -- well, I have a note here, actually -- two and three, I think we went over some presentation of that with you. And a lot of difference scenarios. I took away from your presentation that a lot of different scenarios were looked at there. Am I correct in interpreting that at the end of the day, what your assessment is attempting to confirm is that under any scenario, the maximum flood level would be below the grade that we're concerned about, you know, safety-related structure systems and components? Is that at bottom in looking at the many scenarios what you're trying to confirm there?

GERRY STIREWALT: Yes. I can't roll it out positively, I mean, but I feel, you know, I sleep very well at night knowing the site is a flood dry site. So the short answer is yes.

COMMISSIONER SVINICKI: Okay. Thank you. And then, returning to the PSHA for the application, since I received the general description from the applicant that as they can prepare it and develop to the probabilistic seismic hazards analysis, they were, in their assessment, really trying to work on the cutting edge of available tools

and techniques, is there anything there in terms of the staff's review that we can apply both to ongoing COLA reviews but also perhaps to GI-199? Is this -- can we take any learnings, and, perhaps, it wouldn't be the Office of New Reactors that would do this. I don't know if the Office of Research is also looking at this, but given that we had have an opportunity in the review of this license application to look at and review from our perspective a fairly advanced PSHA, is there any generalized learning or things that we can take back to apply beneficially to our approach to GI-199? I don't know if there's -- make there isn't. This is more of a programmatic issues. I don't know if there's anyone who wants to address that.

CLIFF MUNSON: I'm Cliff Munson, I haven't been sworn in. I'm a senior technical advisor.

CHAIRMAN JACZKO: Oh, you have not been sworn in?

CLIFF MUNSON: And I have not.

CHAIRMAN JACZKO: If you have not, then we need to swear you in. Go get the swearing-in procedures?

[laughter]

CLIFF MUNSON: My answer better be worth it, right?

CHAIRMAN JACZKO: Yeah, it better be.

[laughter]

CHAIRMAN JACZKO: Thank you, please state your name and title?

CLIFF MUNSON: Clifford Munson, senior technical advisor, Division of Siting an Environmental Review.

CHAIRMAN JACZKO: And then -- what am I supposed to do? Oh, then I swear you in.

[laughter]

CHAIRMAN JACZKO: Where is the swearing-in script? Oh. Do you swear -- or please raise your right hand and provide an audible response. Do you swear or affirm that the testimony you will provide in this proceeding is the truth, the whole truth, and nothing but the truth?

CLIFF MUNSON: I do.

CHAIRMAN JACZKO: Okay. You're all set.

CLIFF MUNSON: Okay, what was the question?

[laughter]

No, I --

COMMISSIONER SVINICKI: This is the part where I better not say never mind.

CLIFF MUNSON: No --

COMMISSIONER SVINICKI: It was, again, having through the review of this license application, the staff has had the opportunity to put eyes on, you know, a fairly advanced PSHA. Is there anything we can take from that and apply more generally to the benefit of our pursuit of resolution of GI-199?

CLIFF MUNSON: In the development of GI-199, the generic letter, we asked the licensees -- we had asked the licensees to do a probabilistic approach similar to the PSHA that we've done. And the NRC as an agency switched to probabilistic in the seismic area in the mid-

90s. So we've pretty familiar with PSHA. And I would have to say Summer was a pretty standard application in terms of its PSHA. The heavy lifting was with the Charleston seismic source zone, and that was done with Vogtle. So Summer actually was pretty standard.

COMMISSIONER SVINICKI: Okay. Thank you. Thank you, Mr. Chairman.

CHAIRMAN JACZKO: Commissioner Apostolakis.

COMMISSIONER APOSTOLAKIS: Thank you. On Slide 7 of the applicant, you said that the value at the 100 hertz of the GMRS is .23G, which I assume is the SSE of the site, right, of the safe shut down earthquake?

ROBERT WHORTON: That's correct.

COMMISSIONER APOSTOLAKIS: Do you remember what it is for the existing unit?

ROBERT WHORTON: Yes, I do. The existing Unit 1, it's SFC omerock [spelled phonetically] is .15G, 15 percent of gravity.

COMMISSIONER APOSTOLAKIS: I see. It's 15 percent versus 23 percent?

ROBERT WHORTON: Correct.

COMMISSIONER APOSTOLAKIS: Now, since we're on this figure, what is the difference between the CMRS, CSDRS, and the hard -- the HRHF?

ROBERT WHORTON: Okay, the certified seismic design response spectra was the original design input seismic motion for the AP1000.

COMMISSIONER APOSTOLAKIS: Okay.

ROBERT WHORTON: As the applications were initiated and the development of the GMRS, the ground motion response spectra, for each of the first applications, it became very obvious that for hard rock sites, they were all showing exceedences above the certified design and higher frequency, similar to what you see with the --

COMMISSIONER APOSTOLAKIS: So the CSDRS is supposed to cover all frequencies and regardless of whether you have a rock or soil?

ROBERT WHORTON: If there was the original design spectra and --

COMMISSIONER APOSTOLAKIS: Okay.

ROBERT WHORTON: -- there's an issue here that the CSDRS was developed based on Regulatory Guide 1.60. And Reg Guide 1.60 was last modified in 1974. It was based -- the shape of the curve was based on recorded western earthquakes. There were not many, if any, earthquakes recorded in the East Coast, nor were there any sizeable earthquakes. So the shape of the spectra has been an accepted shape for most of the design of the nuclear plants in this country. It was only until this new probabilistic seismic hazard analysis process was implemented that when the new applications came forward, it was observed that being in the east, they were exhibiting a higher frequency content, which, in fact, did exceed the certified design.

COMMISSIONER APOSTOLAKIS: But why is this high frequency curve lower than the low DAC [unintelligible] for lower frequencies? I mean, I could see the original curve being modified on the high frequencies, but why did we lower the accelerations for lower

frequencies, say, below 10 hertz?

ROBERT WHORTON: We did not lower it. The shape of the curve is based on the guidance from ASCE standards and the probabilistic hazard analysis process. It's the out product of all of the analyses. Had we used the deterministic process from the days of old, we could have maybe determined a peak ground acceleration and then shaped the spectra similar to the Reg Guide 160 shape. However, this is result of the process at this point.

COMMISSIONER APOSTOLAKIS: So am I to conclude then that the CSDRS is not valid anymore?

ROBERT WHORTON: No. What that tells us is at lower frequencies, the AP1000 has a very robust design.

COMMISSIONER APOSTOLAKIS: It's margin?

ROBERT WHORTON: As with the [unintelligible] margin.

COMMISSIONER APOSTOLAKIS: Okay.

ROBERT WHORTON: That's what that tells us.

COMMISSIONER APOSTOLAKIS: Okay, thank you.

Now to the staff. Your slide 12 is the same thing. 10.15 -- I mean, the same thing, I mean the same person -- the SMA was done using the hard rock spectrum?

MALCOLM PATTERSON: Malcolm Patterson again. The SMA was based on the CSDRS. When Westinghouse did the additional five cases from soft sell to hard rock high frequency, what they did was they confirmed that the structural response spectra were similar to the instruction response spectra for the CSDRS. And it was on the basis of

that similarity that they determined that the seismic margins analysis stilled applied to the various sites.

COMMISSIONER APOSTOLAKIS: So the actual SMA was done using the CS C -- it's a very long acronym, guys, I mean --

[laughter]

It's a CSDRS. Is that true, that the SMA was done using that?

MALCOLM PATTERSON: That's correct.

COMMISSIONER APOSTOLAKIS: And then they showed that using the other one doesn't make a big difference?

MALCOLM PATTERSON: Correct.

COMMISSIONER APOSTOLAKIS: Okay. You said that it was important to do seismic analysis because the internal event core damage frequency's so low, 3 times to the minus 7, that probably earthquakes dominate. Maybe you didn't use the dominate.

[laughter]

But would be -- would have an impact. But by doing an SMA, you can't really tell what the impact is, can you? All you can say is that the review level earthquake is pretty high and we're happy.

MALCOLM PATTERSON: I would agree with that statement.

COMMISSIONER APOSTOLAKIS: We know you will. You will. You do agree.

MALCOLM PATTERSON: We can't do a seismic PRA yet. But when we do, then we'll maybe --

COMMISSIONER APOSTOLAKIS: That's the next question.

[unintelligible]. You said that they will have to do a PRA before fuel [unintelligible]. Would that be using SMA as well?

MALCOLM PATTERSON: No. They will be doing a seismic PRA.

COMMISSIONER APOSTOLAKIS: Okay, so we will have a much better idea of what the core damage frequency --

MALCOLM PATTERSON: Yes, we should.

COMMISSIONER APOSTOLAKIS: -- would be?

MALCOLM PATTERSON: However, one of the licensed conditions is to do a walk-down to confirm that the seismic margins analysis remains valid.

COMMISSIONER APOSTOLAKIS: Now, somewhat more general question. They have to submit the summary of the PRA, correct, that's what part 52 says? Then what do you guys do with it? I would say that you are not using it at all, is that the correct statement? Unless they show you a sequence of 10 to the minus 2, but they don't. Nobody does that. So does it affect the licensing process at all, except for the seismic?

MALCOLM PATTERSON: The case of AP1000 is a little different because when the initial application was made, it was a requirement to submit a report detailing the PRA, so we had the AP1000 PRA.

COMMISSIONER APOSTOLAKIS: Okay.

MALCOLM PATTERSON: We used that information to attempt to risk inform our regulatory review. We tried to identify to the technical staff which of the systems were most risk significant, which components were more risk significant than other components.

COMMISSIONER APOSTOLAKIS: But do the regulations allow them to focus on those? I mean, Part 50 doesn't say that. I mean, they have to follow Part 50, don't they?

MALCOLM PATTERSON: Well, we're under 52. I mean, the review is done in accordance with the standard review plan. And the fact that something is not risk significant doesn't excuse us from evaluating it. But the level of effort and the intensity of the review can certainly be shaped so that our efforts go to [unintelligible] more important.

COMMISSIONER APOSTOLAKIS: So there was some indirect impact on it?

MALCOLM PATTERSON: [affirmative]

COMMISSIONER APOSTOLAKIS: Yeah. By the way, speaking of the peer review, I remember from the old days the PRA subcommittee of the ACRS does go into fairly detailed review -- and you're smiling. Do you agree in --

MALCOLM PATTERSON: Yes, sir.

COMMISSIONER APOSTOLAKIS: You have good memories of that.

[laughter].

Although that's not really the peer review you had in mind, Mr. Chairman.

The other thing is I really don't know how the PRA model the passive systems. Is it still that they are liable with reliability equal to unity? Does anybody say anything about failure of passive safety systems?

MALCOLM PATTERSON: Well, we use that initiating events that

involve the failure of passive systems being -- that's what ALUCA [spelled phonetically].

COMMISSIONER APOSTOLAKIS: But not as a response to another initiating one like we usually do with the [unintelligible] or the other systems?

MALCOLM PATTERSON: That's correct.

COMMISSIONER APOSTOLAKIS: That we don't consider.

MALCOLM PATTERSON: That [unintelligible] --

COMMISSIONER APOSTOLAKIS: And I have one last question for Ms. -- I'm sensitive to pronouncing names. Tabatabai?

SARAH TABATABAI: Tabatabai.

COMMISSIONER APOSTOLAKIS: Yeah, I did it. You said that the weights of .7 and .1.1.1 for the three region -- or four regions.

SARAH TABATABAI: Yes?

COMMISSIONER APOSTOLAKIS: Is your weights or the applicant's weights or the USGS's weights?

SARAH TABATABAI: The applicant's weights, which they develop the model in the Vogtle ESP originally and they used the same model [unintelligible] --

COMMISSIONER APOSTOLAKIS: But the weights cannot be developed from a model, can they? I mean, it's somebody's subjective judgment of this is really where the action is.

SARAH TABATABAI: It's -- the way it was developed as part of the original, the Charleston source model. For each source zone, they've -- it was basically to capture uncertainty. Most of the weight

was given to that small area where there, let's see, most of the liquefaction data is.

COMMISSIONER APOSTOLAKIS: But it was some expert -- group of experts --

SARAH TABATABAI: Oh, yes. Yeah.

COMMISSIONER APOSTOLAKIS: -- who said by looking at all this evidence, we believe it's .7 --

SARAH TABATABAI: Yes, they [unintelligible] --

COMMISSIONER APOSTOLAKIS: -- is that correct?

SARAH TABATABAI: -- [unintelligible] to update for that Charleston source [unintelligible].

COMMISSIONER APOSTOLAKIS: That's a low blow [spelled phonetically]. I was part of this, that's why.

[laughter]

But did anybody do a sensitivity analysis to say, what if it is .5, for example, and this other one is .2? Do we know what the uncertainty involved there is?

SARAH TABATABAI: They didn't do a sensitivity -- and I don't have an analysis for that.

COMMISSIONER APOSTOLAKIS: Okay. Nothing else, thank you.

SARAH TABATABAI: But no, they just --

COMMISSIONER APOSTOLAKIS: Oh, I'm sorry.

SARAH TABATABAI: -- [unintelligible] put based on the evidence available suggested, you know, the ongoing area of seismicity was concentrated in that small red area and the paleoliquefaction data

was concentrated there.

COMMISSIONER APOSTOLAKIS: So to understand, who did this? Who assigned the .7?

SARAH TABATABAI: The applicant. As part of the shock process, they were technical integrator. They had a --

COMMISSIONER APOSTOLAKIS: Okay, they were [unintelligible] --

SARAH TABATABAI: -- [unintelligible] and they kind of tried to encompass the scientific community -- their interpretations.

COMMISSIONER APOSTOLAKIS: I understand, thank you, very much.

SARAH TABATABAI: Yeah.

ROBERT WHORTON: Can I -- Bob Whorton --

COMMISSIONER APOSTOLAKIS: Absolutely.

ROBERT WHORTON: -- again, South Carolina Electric and Gas. The original 1989 EPRI study involved six earth science teams.

COMMISSIONER APOSTOLAKIS: I know, yeah.

ROBERT WHORTON: You're aware of those. Each of those teams had a team of experts or had a group of experts, and they had a consensus opinion on seismic sources, the weighting of those sources, and so forth. So that was part of the model that was used. And then when we did the update for the COL application, we reevaluated the assessments. But the consensus of opinion was the weighting that you had referred to. There wasn't just one individual.

COMMISSIONER APOSTOLAKIS: Sarah mentioned that you were the

technical integrator. Was that -- which level of the shock analysis did you implement, technical integrator facilitator or whatever?

ROBERT WHORTON: Well, I was not part of it. But the original EPRI study was a shock level 4 process.

COMMISSIONER APOSTOLAKIS: Four?

ROBERT WHORTON: Yes.

COMMISSIONER APOSTOLAKIS: That's pretty good. Thank you.

CHAIRMAN JACZKO: Commissioner Magwood.

COMMISSIONER MAGWOOD: Well, as would -- as often happens after you follow Commissioner Apostolakis, my questions have all been answered. So let me just pass and just congratulate Dr. Stirewalt for being the first person in history to have his photographed in the permanent record of the mandatory hearing.

[laughter]

Thank you. A dubious distinction [unintelligible].

CHAIRMAN JACZKO: Commissioner Ostendorff.

COMMISSIONER OSTENDORFF: Well, I think, Gerry, we all admire your passion and, I think we want to sign up for the next field trip.

[laughter]

GERRY STIREWALT: All right, you're on.

COMMISSIONER OSTENDORFF: Let me ask a couple of questions here. Ken, I want to go to this local intense precipitation issue. Does that look bad just by itself as heavy rains or are there also dam breaks or hurricanes or high winds that are combined with the intense precipitation?

KENNETH SEE: For the local intense precipitation, it's just rainfall only. That's applied directly over the site.

COMMISSIONER OSTENDORFF: Thank you.

KENNETH SEE: So the fetch, which is used to, you know, in wind calculations, doesn't play a role because it's too small, the site is very small.

COMMISSIONER OSTENDORFF: Okay. Is there any -- I know in your Slide 2, it looks at the hypothetical up stream dam breach, so and embankment breaches, were those of any consequence in or limiting?

KENNETH SEE: No. The applicant did a very, very conservative analysis. What you won't find in the application is discussions on dam breach parameters. That's an ongoing area of research and a lot of arguments in the technical community. They avoided that by just assuming that the dams disappeared and translated -- transposed all the water downstream, including a hypothetical reservoir. I think it's the Clinchfield Dam that was proposed at some point to be built. And they put it all in the Parr Reservoir. Further, they assumed there was a dam, a vertical wall [unintelligible]. So they would not allow any releases downstream, which is, I mean, it's very conservative. So the analysis -- and they still have margins, so.

COMMISSIONER OSTENDORFF: Okay. On your Slide 3, you had the conceptual model for groundwater flow in the Piedmont Province. Lots of disciplines [unintelligible] I also know no particular hydrology, but I can imagine there are multiple models or as least different ways of simulating the flow and so forth. Is the model that was used by the

applicant and by the staff, are those consistent with generally accepted models within your community?

KENNETH SEE: I'm going to refer that to Dan Barnhurst who led the effort in the groundwater area.

DAN BARNHURST: Yes, my name is Dan Barnhurst. I'm a hydrogeologist with the NRO, participated in the review of 24.12 and 24.13, and I have been sworn in.

So the conceptual model figure that provided as part of the slide, is one from the USGS report in 1990. It's just a general figure for typically conditioned that you would find with hydro geology in the [unintelligible] region. One of the things that the applicant did and we evaluated as part of our review was, in their site characterization processes they drilled wells. They installed water level wells. They sampled those 13 months, I believe, on a monthly basis. And then they used those values to develop the potentiometric surface maps that were displayed earlier by Mr. Summer. And that -- so I provided that slide just to show generally how things are. In general site conditions, based on site studies, agree with that on that slide down there.

COMMISSIONER OSTENDORFF: Okay. Thank you. Sarah, I'm going to go to you. I think you had Slide 12, is that right? Is that your slide?

SARAH TABATABAI: Yes.

COMMISSIONER OSTENDORFF: Okay. Commissioner Apostolakis asked some questions he arose to make sure I understand this. If the Summer plant were not going to be built on hard bedrock, would that

black curve go away?

SARAH TABATABAI: Yes, it's only irrelevant to hard rock sites.

COMMISSIONER OSTENDORFF: So it's because the special site-specific geology that that curve is there?

SARAH TABATABAI: Yes.

COMMISSIONER OSTENDORFF: Okay, the second bullet on the left-hand side, it talks about the high frequency seismic input was evaluated in the AP1000 DCD and is considered to be non-damaging. Help me understand for high frequency components for, I guess, electrical, electronic, kind of digital IMC, perhaps, for those components that are more susceptible in the high frequency area, what does non-damaging mean? That means that they don't have any impact on them or is there some noise level, some oscillation spiking? I'm trying to understand what non-damaging means with respect to instrumentation

SARAH TABATABAI: Okay, I'd like to roll that to Bret Tegeler. He was the [unintelligible].

BRET TEGELER: Yes, Mr. Commissioner, my name is Bret Tegeler, I'm a senior structural engineer the Office of New Reactors, and I have been sworn in.

To answer your question, this statement exists in the literature. Primarily, it's a generalism of phenomenon of high frequency ground motion, in that generally, it's considered to be non-damaging. However, in the case of AP1000, there were special considerations made, in particular, for electrical equipment for -- and

as Malcolm mentioned, enhancing equipment response spectra and qualification, to include high frequency input. For other systems, like, in the structural area I'm most familiar with, high frequency effects are generally small to insignificant. Structural design is primarily covered or dominated by the CSDRS and the frequency range is less than 10 hertz where you see most of your mass participation and energy input.

COMMISSIONER OSTENDORFF: So the non-damaging phrase here is a term of art?

BRET TEGELER: It's a term of art. And we took a careful look at the Westinghouse analysis for that to make sure that -- and we weren't just swallowing the term of art. We looked at very explicitly, the significant components, structural, mechanical [spelled phonetically], and electrical.

COMMISSIONER OSTENDORFF: Thank you. Thank you, chairman.

CHAIRMAN JACZKO: Well, thank you for your presentations. And we will take a five-minute break. We'll come back at 3:30. Thank you.

[break]

CHAIRMAN JACZKO: For our third and final safety -- (coughs) excuse me -- panel of the day, the presenters will address Chapters 6, 8, 9, and 13 of the Final Safety Evaluation Report and the relevant sections of the application. These chapters touch on important issues, such as the proposed plan engineered safety features and auxiliary systems, as well as off-site power emergency planning. I should note

that the staff has informed the Commission that they do not have specific topics to discuss on all the remaining chapters, but if the Commissioners have requests regarding these chapters, this would be the most appropriate time to raise them. Again, if could ask all the witnesses seated at the tables to please state your name and title for the record, starting with the applicant.

ROBERT WILLIAMSON: Robert Williamson, manager of merchant planning, SCE&G.

AMY MONROE: Amy Monroe, licensing engineer, SCE&G.

TIMOTHY SCHMIDT: Timothy Schmidt, engineer with SCE&G.

JAMES LABORDE: Jamie LaBorde, consulting engineer with New Nuclear Deployment of SCE&G.

DON HABIB: Don Habib, Office of New Reactors.

DAN BARASS: Dan Barass, office of Nuclear Security and Incident Response.

CHAIRMAN JACZKO: Great. Again, if I could ask the staff to move over a little bit, we'll let the applicant make their presentation. So please go ahead.

AMY MONROE: If we could see our slides, please? And move to the next -- there we go, thank you. Just as it is.

Panel 3 is the final safety panel to be presented. Within this panel, we'll discuss the following topics: Emergency planning, including a discussion of the specific departure to relocate our technical support center and operations support center. An additional discussion on the methodology utilized for toxic gas evaluations within

our FSAR, a brief discussion of the site-specific portions of some of the auxiliary water systems contained in Chapter 9 of the FSAR, and the site-specific discussion of the off-site power system as described in Chapter 8. Mr. Bob Williamson will begin with the discussion on emergency planning. If I could have the next slide, please? Bob?

ROBERT WILLIAMSON: Thank you, Amy. Good afternoon, Mr. Chairman and commissioners. 10CFR 5279, part alpha 21, requires a combined operating licensed application to include an emergency plan, that complies with the requirements of 10CFR 5047 and Appendix echo [spelled phonetically] to 10CFR 50. The VC Summer nuclear station radiation emergency plan is provided as Part 5 of the COLA. It establishes the concepts, evaluation and assessment criteria and protective actions necessary to limit and mitigate the consequences or potential consequences of actual emergencies. SCE&G is utilizing the consolidated emergency plan for all three units at the site.

The proposed EPI tech for VC Summer Units 2 and 3 can be located in the COLA Part 10. The EPI tech were based on the guidance contained in regulatory guide 1.206, part 2, Appendix Bravo, and NUREG 0800 Section 14.3, Part 10 [spelled phonetically]. Next slide, please.

The radiation emergency plan was developed utilizing the format of NUREG 0654, the criteria for preparation evaluation of radiological emergency response plans and preparedness in support of nuclear power plants and contains multiple sections, including the following: Part 1, which is introduction site overview. Part 2, which are planning standards and criteria. There are three annexes each for

each unit with the unit specific information and several appendices, including the evacuation time estimate and letters of agreement from various supporting agencies. A licensed condition has been proposed, which requires SCE&G to submit a set of four developed emergency action levels to the NRC at least 180 days prior fuel load. Certain design details are not yet complete to allow the EALs to be fully developed at this time. The EALs will be developed in accordance with the NEI0701, methodology for development of emergency action levels, advanced passive light water reactors, provision zero. These EALs would have been reviewed with and agreed upon by state and local officials prior to the submission of the NRC for regulatory approval. Next slide, please.

Next, I will discuss a novel issue of the emergency planning zone. The emergency planning zone for VC Summer nuclear station, Unit 1, was developed utilizing the guidance of NUREG 396. Planning basis for the development of state and local governments, radiological emergency response plans in support of light water reactors in the aforementioned NUREG 0654. The EPC banners are based on the demography, topography, land use characteristics, access routes and jurisdictional boundaries. Risk population, such as schools, daycare centers, and assisting living facilities within the emergency planning zone and those which were nearby but outside the 10-mile radius, are also included in the emergency planning zone.

In October 2006, members of the South Carolina emergency management division, representatives of the emergency management agencies of the four risk counties -- Fairfield, Newberry, Richland, and

Lexington, as well as representatives from SCE&G met and determined the existing emergency planning zone will be support of the development of the evacuation time estimate. The SS memo [spelled phonetically] was submitted to the NRC was an appendix to the radiation emergency plan. The decision to utilize the existing emergency planning zone was affirmed by elected officials in each of the four counties. It was endorsed by letter by the South Carolina emergency management division. Next slide, please.

The radiation emergency plan takes one departure from the AP1000 DCD. This departure includes the location of the technical support center and operational support centers. The Unit 2 and 3 technical support center will be co-located with the Unit 1 technical support center, which is to be located in the basement of the new nuclear operations building, and is between the protected areas of the three units. The combined TSC allows for a centralized command control structure to manage the event at any or all three units. In addition, the new location allows for better accessibility and a more timely response by the emergency response organization during an emergency, including a hostile action above [unintelligible] type event at the station. Relocation of the technical support center to this facility allowed us to relocate the operational support centers to the DCD TSC locations, which are adjacent to the control room and within the control room envelope. Next slide, please.

Some significant emergency planning milestones, which can be found within our ITAAC include the following: A full participation

exercise will be conducted with the state agencies in four risk counties. This exercise will be evaluated by both the NRC and FEMA within two years of the scheduled date of initial loading of fuel. And on-site exercises evaluated by the NRC within one year before their scheduled date of initial loading of fuel. Detailed implementing procedures for the radiation emergency plan will be submitted to the NRC in accordance with 10CFR 50.4 at least 180 days prior to the scheduled date of initial loading of fuel. In addition, the emergency response status system implementation program will be submitted at least 180 days prior to the scheduled date for the initial loading of fuel. Next, Amy Monroe will discuss toxic guess. Next slide, please.

AMY MONROE: As directed in the Commission order, I'd like to provide a brief discussion on the methodology utilized in the toxic gas evaluations went the VC Summer Units 2 and 3 FSAR.

Accidents involving the releases of toxic chemicals are evaluated in FSAR section 2.2.3.1.3. The primary modeling code used in the VC Summer COLA toxic gas evaluations was the ALOHA code. This code is a modeling program developed jointly by NOAA and the environmental protection agency to estimate threat zones associated with hazardous chemical releases, including toxic gas clouds, fires, and explosions. It has the capability to model both neutrally buoyant and heavy gases. ALOHA was used to determine the maximum distance a cloud could travel before it disperses enough to fall below the immediately dangerous to life and health or IDLH concentration.

The chemicals that required evaluation are listed in FSAR

table 2.2-209. These chemicals -- this is includes the chemicals that are located at VC Summer Unit 1 at the par combustion turbines, and also those that are considered to be credible from a railcar spill along the river's edge. Note that for evaluations of the railcar spill, there was no credit taken for the topography and elevation changes in that area. The analysis determined that the formation of the toxic vapor cloud following an accidental release of potentially hazardous materials, would not adversely affect the safe operation or shut down of VC Summer Units 2 and 3.

Now, Mr. Tim Schmidt will summarize some of the site-specific water systems found in Chapter 9 of the FSAR. The next slide, please. Tim?

TIMOTHY SCHMIDT: Good afternoon. This presentation discusses site-specific systems associated with Chapter 9 auxiliary systems of our FSAR. Chapter 9 includes a number of systems such as water systems, chemistry sampling systems, various HPAC systems, and other auxiliary systems. Specifically, we will discuss the site-specific raw water system and the site-specific portion of the wastewater system.

The raw water system for Units 2 and 3 is site-specific, provides makeup to various plant systems, including the demineralized water treatment system, the fire protection system, the service water system, and the circulating water system. The raw water system is not safety-related and it's failure does not lead to the failure of any safety-related systems.

The wastewater system for Units 2 and 3 includes standard plant and site-specific portions. The site-specific portion of the wastewater system, does not have any safety function. The wastewater system for Units 2 and 3 includes a common wastewater blowdown line that discharges to a plant outfall at Parr Reservoir. This blowdown line carries a number of waste streams, including circulating water tower blowdown, process waste effluents treated sanitary waste effluent, and treated effluent from the liquid rad waste system. Next slide, please.

A wastewater system blowdown line and it's interfaced with the liquid rad waste system from Units 2 and 3, meets 10 CFR 201406. Specifically, we have committed to the Industry template NEI 0808 alpha, which implements regulatory guidance contained within NRC regulatory guide 4.21. We have incorporated a number of lessons learned and operating experience into the design of our wastewater system blowdown line to minimize risk of groundwater contamination.

Specifically, corrosion resistant, high density, polyethylene, or HDPE, is utilized as opposed to carbon steel, for example. And HDPE does not require mechanical joints for installation, such as with fiberglass and ductile iron installations, which could have the potential for leakage. We intend to weld together the HDPE piping segments that make up a blowdown line.

In addition, our design for the blowdown line does not include components, such as valves, pumps, and vacuum breakers between the point at which liquid rad waste treated effluent is introduced in the plant outfall discharge point at Parr Reservoir. Components such as

these have been sources of groundwater contamination events in the Industry. Non-pressurized flows to our wastewater system blowdown line is driven by gravity and primarily has opened channel flow.

In Chapter 12 of our FSAR, we have committed to a groundwater monitoring program that utilizes the Industry, NEI 0808 alpha template. This program will evaluate [unintelligible] piping on-site, including our wastewater system blowdown line, install means for monitoring leakage as required. Next slide, please.

Construction of our HDPE [unintelligible] of wastewater system blowdown line will include a number of measures to ensure leakage-free operation. These measures include using qualified welders and equipment, inspections of welded joints and piping segments, and hydrostatic tests to detect leakage at welded joints or defects in the piping.

In addition to a quality insulation, we expect long life from our blowdown line. HDPE, as a piping material, has been used in Industry for over 40 years. Now we'll turn over the presentation to Jamie LaBorde. If you could go to the next slide, please?

JAMES LABORDE: A new 230kB switchyard is being built for Units 2 and 3. A breaker and a half configuration is used for the 12-line connections and the reserve box transformer connections and a double-bust, double breaker configuration is used for the two generators stepup transformers. The Unit 2 switchyard is to the west of the existing Unit 1 switchyard. Lines heading west and south and one line heading north exit the Unit 23 switchyard. Lines heading to the east

and south and one line heading north exit the Unit 1 switchyard. There are three connections between Unit 1 and Unit 23 switchyard. Our studies have shown any one of the 12 lines can carry the maximum power requirements for both units simultaneously for normal, abnormal, or accident conditions. The ITAAC in table 2612-1 confirm the as-built condition meets this requirement.

Failure analysis were performed with acceptable results. Specific information related to the grid's stability study is included in FSAR Section 82. Grid stability studies were performed to comply with the north North American Reliability Corporation, commonly known as NARC. The AP1000's interface requirement, which includes the requirement to maintain voltage to the reactor coolant pumps about three seconds after a turbine trip event in Reg Guide 1.206. An as-built grid stability study is required by ITAAC contained in table 2612-1.

Over 95 percent of our lines for the project are in existing rightaways. We have identified our routes and are working toward getting the required easements for the remainder of our lines, which is approximately 6.5 miles. This concludes our presentation.

CHAIRMAN JACZKO: Thank you. And I'll have the staff come with their presentation.

DANIEL BARASS: Good afternoon. Slide 1, please. My name is Dan Barass. I'm the team leader in the Office of Nuclear Security Incident Response in the division of preparedness response to new reactor licensing branch. During this panel, I will -- discussion, I will present highlight's of the staff's evaluation of the Summer

combined license application related to emergency preparedness. Seated next to me is Don Habib, a project manager in the Office of New Reactors. Following my presentation, Mr. Habib, will present highlights from specific areas of the staff's evaluation on the subject of control and habitability through raw water and wastewater system and the off-site power.

I'd like to also acknowledge the other NRC staff members that performed the review in this area and developed a safety evaluation. Many of them are here today to help answer any detailed questions that you may have related to the staff's review. As a team leader, I had oversight of the day to day activities of the team that conducted the review of the emergency preparedness matters for the Summer COL. I have worked most of my career in the nuclear Industry in the emergency preparedness area. Since 1989, 22 years now, I've been with the NRC. Slide 2, please.

I'd like to take a few moments to review quickly, some of the regulatory requirements and guidance documents related to emergency planning. In accordance with 10 CFR 52.79A21, a COL shall include information on emergency planning that complies with the requirements in Part 50. The regulation states that no initial combined license will be issued unless a finding is made by the NRC that there's reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. The NRC bases its findings on a review of the Federal Emergency Management, or FEMA, findings and determinations as to whether state and local emergency plans are

adequate and whether there is reasonable assurance that they can be implemented. The NRC also bases its findings on NRC's assessment as to whether the applicant's on-site emergency plans are adequate and whether there's reasonable assurance that they can be implemented. The NRC will then make a finding, an overall finding of reasonable assurance for the emergency plans, taking into account the on-site and the off-site reviews.

In 10CFR 47 -- I'm sorry, 10CFR 50.47, there are 16 standards, normally referred to as the "Planning standards" that off-site and on-site emergency plans must meet. Additionally, in Appendix C to Part 50, the regulations specifies information that a emergency plan shall contain.

The last regulatory requirement, I want to highlight is found in 10CFR 50.33G. This section of the regulations states that generally, the plume exposure pathway emergency planning zone for a nuclear power reactor shall consist of an area of about 10 miles or 16 kilometers in radius. However, the exact size and configuration of the EPZ surrounding a particular nuclear power reactor, shall be determined in relation to the local emergency response's needs and capabilities as they are effected by such conditions as the demography, the topography, the land characteristics, access routes, and jurisdictional boundaries. The staff conducted its review in accordance with the standard of review plan, NUREG-0800, section 13.3, emergency planning. And the criteria and recommendations in NUREG-0654, FEMA Rep 1, Revision 1, which is titled "Criteria for Preparation in the Evaluation of Radiological

Emergency Response Plans and Preparedness in Support of Nuclear Power Plants." These are considered by the NRC staff to be an acceptable method to show the emergency plan meets the 16 planning standards.

For the Summer COL application, the NRC staff reviewed the emergency plans and evaluated the organization for coping with radiation emergencies, assessment actions, activation of emergency responsive facilities, notification processes, and capabilities to effectively communicate, including notifying the on-site staff and off-site officials, emergency facilities and equipment, training, provisions for maintaining emergency preparedness, plants and recovery actions, the evacuation time estimate, dose assessment capabilities, and the plans for response to hostile actions. Slide 3, please.

One unique aspect of the Summer application is the location of the technical support center, referred to as a TSC, and the operational support center, referred to as the OSC. The applicant stated that the TSC will not be located in the control support area, or CSA, as identified in the AP1000 design and control document, or DCD. The TSC location is to be a central location such that a single TSC can serve all three units at Summer.

Additionally, the OSC is being moved to the location identified in the AP1000 DCD to the CSA vacated by the move of the TSC. The transit time between the TSC and the effected control room will be approximately 10 to 15 minutes and includes processing time through the exclusionary and protected area security control points. The TSC will have dedicated diverse communication capabilities between the effected

control rooms, technical support center, the OSC, and the emergency operations facility at [unintelligible]. Use of the current technologies, such as updated computer equipment, telecommunication -- teleconferencing realtime system monitoring of plant data, telephone and radio systems for primary and backup emergency communications will bridge this physical separation. The staff found that this meets the guidance for the TSC, and thus, found it to be acceptable. Having a common TSC that supported multiple reactor units and is located a moderate distance from the control room, represents a distinct advantages. These include the increases efficiency of a centralized point to support the entire site, the elimination of confusion regarding which TSC on a multiunit site will be staffed in an emergency, not having to staff multiple TSCs if an incident involves more than one unit and consideration of security-related events. The staff finds that the relocation of the Unit 2 and 3, with respective OSCs, to the CSA, is acceptable because the CSA provides an area that will allow the OSC to adequately support its intended emergency response functions. Slide 4, please.

Another unique aspect of the Summer COL application is a proposed plume exposure pathway emergency planning zone. Regarding the size of the emergency planning zone, NUREG-0654 includes guidance consistent with the information in the regulatory requirements found in section 50.33G, that judgment should be used by planners to determine size and shape of the specific EPZ in consideration of local conditions. The Summer COL applications stated that the existing emergency planning

zone for Unit 1 would also be used for Units 2 and 3. This is typical of an application where a new reactors plan to be added to an existing site.

The EPZ is defined as the area for which planning is needed to assure that prompt and effective actions can be taken to protect the public in the event of an accident. The use of the existing EPZ has been endorsed by the state of South Carolina and the four counties, Lexington, Newberry, Richland, and Fairfield, within the 10-mile plume explosion planning zone. As part of the application process and in accordance with the requirements of Section 527922I, the applicant obtained and provided letters of certification from the state and local governmental agencies with emergencies planning responsibilities, that the proposed emergency plans are practicable. These agencies are committed to participating in any further involvement of the plans, including exercises, and the agencies are committed to executing their responsibilities under the plants in the event of an emergency.

During the review [spelled phonetically] process, FEMA issued a request for additional information, or an REI, to address whether the existing EPZ should be expanded approximately one mile to the southwest or if the current EPZ boundary was adequate. The applicant coordinated the REI response with the state of South Carolina emergency management agency and the county emergency management agencies of Lexington, Newberry, Richland, and Fairfield counties.

The additional area addressed by the REI was determined largely a managerial plan of trees supporting its extensive logging

Industry in this area. The population in this area was limited and the secondary road in this structure, has roads that lead away from the EPZ towards a recreational lake area approximately 20 to 25 miles from the Summer Unit 1. The applicant met with the state emergency management staff and the elected officials from the four counties -- Lexington, Newberry, Richland, and Fairfield -- and obtained resolutions from each county commission that the existing EPZ boundary is appropriate for the emergency planning needs of the jurisdiction and adequate to protect the health and safety of the public for the proposed new reactors. Slide 5, please.

This is a picture of the EPZ for the Summer emergency plan. This graphically shows the 10-mile EPZ ring, which is the outer most ring you see in the picture. It shows that the EPZ is actually an irregular shape due to the local topography, demography, and jurisdictional boundaries. In some areas, the EPZ hedge is greater than 10 miles from -- and in other cases, it is less. The EPZ around Summer is a rural area. The stars in the middle are the locations of the existing Unit 1 and the proposed locations of Unit 2 and 3. Slide 6, please.

This slide is a closer look at the area of interest. In this picture, the green arrow is the approximate location of the site. The green line is the approximate borderline of the existing EPZ. The red line shows an alternative boundary of the EPZ that would result if the EPZ is extended to 10 miles from the proposed location of the new units. The NRC staff conducted two site visits to the proposed location for the

new units, including various areas within the 10-mile EPZ. Slide 7, please.

The staff concluded that the applicant's planners did, as suggested by the guidance, use judgment in proposing the size and shape of the EPZ for Units 2 and 3. In accordance with the applicable regulatory requirements, the size and shape of the EPZ for Unit 2 and 3 does consider the local emergency response needs and the capabilities as affected by the demography, the topography, the land characteristics, the access routes, and jurisdictional boundaries. The appropriate state and local organizations were involved in the planning process and support the proposed EPZ. The proposed EPZ for Units 2 and 3 capitalizes on the established infrastructure, training, and public understanding of the existing Unit 1 EPZ to provide a consistent site-wide program. Slide No. 8, please.

In conclusion, by a letter dated June 30, 2010, FEMA provided an interim finding report to the NRC that concluded that the off-site state and local emergency plans are adequate and that there is reasonable assurance that the plans can be implemented with no corrections needed. The NRC staff has reviewed the FEMA report and base its overall reasonable assurance finding on the FEMA finding and determination regarding off-site emergency plans. Based on the NRC staff's evaluation of the emergency plans and the proposed Unit 2 and 3, the staff finds that the applicant's on-site emergency plans meet the standards of 10CFR 50.47B and the requirements of Appendix C to Part 50. The NRC staff finds that there is reasonable assurance that adequate

protective measures can and will be taken in the event of a radiological emergency.

At this time, I will turn over the remainder of the presentation to Don Habib.

DONALD HABIB: Thank you, and good afternoon. My name is Don Habib. I'm a project manager in the Office of New Reactors. I've been managing preparation of staff safety evaluations for the Summer combined license since June of 2010, and I'm here to present information related to three topics of interest in the safety evaluation, in Chapter 6, engineered safety features; Chapter 9, auxiliary systems; and Chapter 8, electric power. May have the first slide, please, Slide 9?

The first topic involves the toxic gas hazard analysis conducted to demonstrate compliance with general design criteria 19. UDC 19 requires the applicant to provide a habitable control room. The applicant must evaluate potential threats to the control room from the release of toxic chemicals. Potential toxic hazards are reviewed in Section 2.2.3 of the staff safety evaluation. Chemicals that meet the screening criteria described in Regulatory Guide 1.78 are subject to further analysis as reviewed in Section 6.4 of the safety evaluation. In the case of the Summer application, there were three site-specific chemicals that warranted further analysis -- ammonium hydroxide, chlorodifluoromethane, and cyclohexylamine. To analyze these hazards, the applicant chose to use a publicly available code called "ALOHA,"

developed by the U.S. Environmental Protection Agency. The applicant's analysis demonstrated that the control room concentrations for all chemicals are well below the established limits.

To perform confirmatory calculations, the stuff used an NRC developed code called "HABIT." HABIT is endorsed for this purpose in Reg Guide 1.78. The staff analysis showed that all concentrations will remain below regulatory limits as well and concluded that some have met regulatory requirements.

When the ACRS reviewed the Summer application and the staff safety evaluation, the ACRS agreed with the staff conclusions regarding toxic gas threats. The ACRS committee members also expressed a concern about the staff use of the HABIT code, in particular, the staff's use of the code for heavier-than-air gases. The ACRS recommended that the staff limit the use of current version of the HABIT code to neutral density gas dispersion modeling. The ACRS recommendation for regarding the use of HABIT do not impact the conclusions regarding Summer's compliance with control-room habitability requirements.

Regarding the ACRS recommendations, the staff agrees that HABIT does not include an explicit heavy gas dispersion model and that HABIT can and should be improved. NRO has requested assistance from the Office of Nuclear Regulatory Research in improving and benchmarking HABIT. The continued use of HABIT for evaluation of toxic gas threats is appropriate as long as code limitations are recognized and understood. The staff and ACRS appropriately took the limitations into consideration when making the safety finding.

In conclusion, through Summer combined licenses, the ACRS agreed with the staff finding that the control room atmosphere meets the regulatory requirement for habitability. Next slide, please.

The next topic I will discuss is related to the raw water system. Revision 19 of the AP1000 DCD did not describe the design of the raw water system. In DCD Chapter 1, it states that the raw water system's out of scope. Therefore, the Summer combined license application provided the design of the site-specific raw water system. The raw water system is classified as non-safety-related and the raw water system serves no safety-related function and, therefore, has no nuclear safety design basis.

The raw water system supply source is the Monticello Reservoir. The raw water intake structure is shared for both Units 2 and 3. One raw water subsystem includes raw water pumps, traveling screens, trash racks, and screen water pumps. The other raw water system, the ancillary raw water system, received water from the Monticello Reservoir via the water treatment plant intake structure and the water treatment plant. The raw water system supplies water to many non-safety-related users, including the circulating water system cooling towers, surface water system cooling towers, dilution water for rad waste discharge from the circulating water system is not available, and the fire protection system. In addition, either of the raw water subsystems can supply water to the non-safety-related service water system cooling towers by way of a cross-tie between the two subsystems. This is a partial list, just to name some of the important users.

In the event of a loss of normal AC power, two out of three of the raw water system intake pumps can aligned to receive power from a non-safety-related standby diesel generators. Next slide, please.

In the response to our request or additional information, or REI, the applicant stated that the raw water system will utilize high density polyethylene, or HDPE, for underground piping. The applicant also stated that the raw water system piping structures are designed and constructed in accordance with nationally recognized codes and standards, such as ASME, ANC B31.1 entitled the Power Piping and the American Waterworks Association. HDPE is a material not susceptible to corrosion. Next slide, please.

This slide shows a picture of two different samples of HDPE that have been fused together. I'm going to stop for a moment. We have brought along a sample of the material, and it's been admitted as Staff Exhibit 16. A picture of this sample was previously admitted as Staff Exhibit 16. What you see in this sample is a result using butt-fusion to join together two pieces of HDPE. On the sample, you can see the beads that are formed on the surface of the pipe. These beads form during the fusion process and mark the location of the fusion joint. I will describe the butt-fusion process more in the next slide. As shown in this picture, HDPE can have different pipe diameters and wall thicknesses. Next slide, please.

Butt-fusion is the process by which the butt ends of two HDPE pipes are connected together. This slide shows the butt-fusion equipment used in the field for fusing buried HDPE pipe. The cutting

wheel is shown at the top of the picture removed from the joint. To fuse two HDPE pipes together, the ends of each pipe are first cut by the cutting wheel. Next, a heating element is placed between the two butt ends for a pre-determined time period. The heating element is then removed and a force is applied to the butt end, squeezing them together. A data logger is typically used to document the pressures, temperatures, and time durations during the fusion process. In addition, a visual inspection is typically performed to verify uniformed beading. Next slide.

The staff reviewed the applicant's FSAR and issued REIs regarding the design of the raw water system. The staff review focused on general design criteria 2 and 4 to ensure the failure of the raw water system and components will not adversely affect system structures or components or SSEs important to safety. The applicant stated in an REI response that the raw water system does not interface with any safety-related SSEs and is not routed in close proximity to safety-related SSEs. The majority of piping is routed underground and a resultant flood from a break in the raw water system piping is bounded by the analysis for a break in the circulating water system piping. The flood analysis for the circulating water system in the yard ensured that the potential water sources are located far from safety-related SSEs and that the site grade would carry water away from safety-related SSEs.

The staff concluded that failure of the raw water system, or its components, will not affect the ability of any safety-related SSEs to perform their intended safety functions because the raw water system

is not located in the vicinity of any safety-related SSEs and the water from a postulated break will not reach any safety-related SSEs.

In summary, the staff concluded that the raw water system will be designed and installed in accordance with applicable standards and meets all applicable regulations. Next slide, please.

The next topic I'll present address minimization of contamination as it relates to wastewater discharges. This slide shows a schematic of how the treated discharge from the liquid rad waste system is managed at Summer. For each of the two planned reactor units, the discharge from the liquid rad waste system flows by gravity through two distinct sections of piping. The first section of pipe appearing at the top center of the slide runs between the rad waste building and the connection to the wastewater system blowdown line. The applicant will monitor this piping for leakage to comply with 10CFR 20.1406.

This regulation, entitled Minimization of Contamination, requires the new reactor applicants to describe how the facility design and procedures for operation will minimize contamination of the facility and the environment, facilitate eventual decommissioning and minimize the generation of radioactive waste.

Appearing in the center of the diagram is the connection point between the liquid rad waste piping and the wastewater system blowdown line. At this location, the liquid rad waste is diluted by a much larger flow in the blowdown line. This dilution flow is sufficient to dilute the liquid rad waste system effluent until the resulting flow meets the release limits of 10CFR Part 20. This diluted liquid rad

waste then drains by gravity through the underground wastewater system blowdown line to a diffuser at the plan outfall at Parr Reservoir.

The wastewater system blowdown line is a single wall, 36-inch diameter pipe made of HDPE. There are no valves, vacuum breakers or pumps along the wastewater system blowdown line between the point where the liquid rad waste system connects and the plant outfall at Parr Reservoir. Groundwater monitoring for leakage of the wastewater system blowdown line would be evaluated and implemented if necessary as part of the Units 2 and 3 groundwater monitoring program. Next slide, please. After reviewing the Summer COL application and the related staff safety evaluation, the ACRS was briefed by South Carolina Electric and Gas on the design of Summer's wastewater discharge line. The ACRS committee discussed the liquid discharge in a subsequent letter to the chairman in which the committee concluded that the plant can be safely built and operated. The committee noted that the tree of liquid discharge are the liquid rad waste system will be diluted to below allowable off-site discharge limits by blending with the cooling tower blowdown. The diluted discharge will then flow approximately one mile through a buried section of HDPE pipe to the plant outfall at Parr Reservoir. Although piping connections at the on sight blending location will be accessible for inspection, the downstream portion of this line will not be readily accessible for inspection. Detection of groundwater contamination will be addressed as part of SCE&G's groundwater monitoring program at the Summer site.

In its FSAR, the applicant committed to follow NEI 0808A for

a description of its groundwater monitoring program. NEI 0808A is entitled to generic FSAR template guidance for life cycle minimization of contamination. NEI 0808A is an NRC-accepted generic template guidance document for life cycle minimization of contamination. It describes a program which is consistent with the guidance provided in the Reg Guide 4.21, entitled Minimization of Contamination and Radioactive Waste Generation Life Cycle Planning. The staff developed Reg Guide 4.21 to provide guidance to Industry on how to meet requirements of Section 20.1406.

Reg Guide 4.21 states that monitoring and routine surveillance programs are an important part of minimizing potential contamination to meet the requirements of section 20.1406. Summer will develop a groundwater monitoring program beyond the normal radioactive effluent monitoring program to ensure timely detection of inadvertent radiological releases to groundwater.

Monitoring for leakage of the wastewater system blowdown line will be evaluated and implemented if necessary as part of the Units 2 and 3 groundwater monitoring program. The staff will conduct inspections to evaluate the acceptability of the applicant's groundwater monitoring program. Next slide, please.

Some of the design features incorporated into the wastewater system discharged by being to comply with 20.1406 are first no-valves vacuum breakers or other fittings are incorporated, outside the building in either the liquid rad waste system or the wastewater system. This minimizes the potential for leaks. Second, the liquid rad waste system

discharge [unintelligible] from the Units 2 and 3 rad waste buildings of stainless steel pipe enclosed within a guard pipe and monitored for leakage to comply with 20.1406. Third, discharge from the liquid rad waste system is diluted in the wastewater system blowdown line to meet the release limits of Part 20, Appendix B. And finally, the wastewater system blowdown line is an HDPE pipe with fused joints. This minimizes the potential for leakage.

The staff concluded in Chapter 12 of the Summer FSAR that the site-specific design features incorporated into the discharge piping comply with the requirements of 20.1406. In addition, the staff found that the implementation of the groundwater monitoring program, based on NEI 0808A, is in compliance with 20.1406 and is acceptable. Next slide, please.

The final topic to be presented in this panel is off-site power. This is a simplified diagram showing how off-site power will be connected to Summer Units 2 and 3. Summer Units 2 and 3 will be connected to a new 230 kilovolts switchyard, which will be supplied by 12 overhead transmission lines to other substations, and of which, three are tie lines connected to the Unit 1 switchyard. The reserve auxiliary transformers of each unit will be connected independently to the switchyard through a 230 kilovolt overhead line.

In the diagram, the central rectangle represents the new switchyard and connections to Summer Units 2 and 3, including the connections to the reserve auxiliary transformers that appear across the bottom. There are tree tie lines to Unit 1, switchyard, I marked on the

left, and the remaining nine off-site connections appear across the top of the diagram. Next slide, please.

The result of the applicant's grid stability analysis indicated that the transmission system will remain stable under shut down, start up, and turbine trip conditions, reserving the grid connection and supporting reacting coolant pump operation for at least three seconds. This is to satisfy the Westinghouse interface requirements specified in DCD Section 8.2.2, but the reactor coolant pump bus voltage remain above the voltage necessary to maintain the flow in the reacting coolant system for a minimum of three seconds following a turbine trip. This is assumed in the accident analysis in DCD Chapter 15.

The NRC staff reviewed the results of the applicant's calculations pertaining to the grid stability analysis and has concluded that the information in the FSAR demonstrates that the grid will remain stable to maintain reacting coolant pump operation for three seconds following a turbine trip as required by the design certification. Thank you, and this concludes our presentation for the panel.

CHAIRMAN JACZKO: Well, thank you for that presentation. I'll maybe start off with a question on the wastewater discharge line. The ACRS says -- I read that letter. It seems to be a little bit more specific and a little bit maybe stronger in their recommendations, although they don't specifically cite in their recommendations to a need to address these issues but their language seems to be a little bit stronger than what I heard from the staff, and maybe you can help

clarify this for me. They say monitoring wells will be relied upon as the only method for detecting groundwater contamination. And this is after they, I think, mention the HDPE pipe. And as they state, localized lack of fusion can occur during the joining of the HDPE piping segments in the field and such defects are not detected by initial inspection on hydrostatic testing and repair can propagate through the pipewall by slow crack [unintelligible]. And I say since many joints will be formed in the field with no provision to inspect them using volumetric methods, undetected defects may grow and cause leaks during the 60-year service life of a pipe. So, what I heard from you, Mr. Beavis [spelled phonetically], is you kept using the phrase "monitoring will be installed if necessary." The ACRS usually are a little bit more direct and say, and says "monitoring will be relied upon as the only method for detecting groundwater contamination." Their groundwater monitoring program should be designed to provide for early detection of any leaks that develop in the HDPE waste water discharge line. The monitoring wall should detect contamination close to the pipe along this entire run before it becomes widespread and well before compliance with 10 -- or 2014.06 [spelled phonetically].

Is what they're saying consistent with what the NEI guidance says, or are they asking for something a little bit more? Or am I just misreading it?

ED ROACH: Good afternoon, my name is Ed Roach. I'm the branch chief of the health physics branch in the reactor's office, and I have been sworn in. At the ACRS meeting, one of the members of the

committee was using his operational experience and experience with the current fleet of plants, and was advocating for, at this point, why not make it a double -- a pipe in a pipe, at this point. And 2014.06 regulation that we evaluate, too, is as practicable. And in this case it's a mile long pipe, and the applicant, as part of the NEI 08-08A [spelled phonetically] guidance, does a risk assessment of the hazardous -- of the systems that can release radioactive material to the environment, and in their case, they will have to situate the monitoring commensurate with that risk.

In the case of this waste water pipe, within a few feet of those double wall pipes being -- injecting the high -- I think the highest is 100 gallon per minute discharge equivalent into the minimum of 6,000 gallons per minute discharge flow. It would be well less than the Part 20 limits, and I think that's why their committee didn't make a stronger recommendation on that.

CHAIRMAN JACZKO: Okay.

ED ROACH: Because it would be --

CHAIRMAN JACZKO: So what -- so, I think what I'm hearing is, so, there may not be monitoring, then, of this particular discharge line?

ED ROACH: We will evaluate the program, but they have to do a risk assessment as part of that, and there -- the idea of the Reg. guide 4.201 [spelled phonetically] and the 2014.06 [spelled phonetically] is to identify as close to the source. And so we would expect to see monitoring along the pipe.

CHAIRMAN JACZKO: Okay, so you would expect consistent with what ACRS was saying.

ED ROACH: Yes.

CHAIRMAN JACZKO: Okay, thank you. Turning to another issue, and this is a question I've asked of OVO [spelled phonetically] as well, and I bring it up because I'm slightly curious and slightly concerned about if there are other comparable situations like this. And this has to do with the emergency action levels. And it may be both -- this question both for the applicant and parts for the staff -- you can explain to me in some -- at least give me an example in some degree of specificity, is what is the information that is currently locking that prohibits us from specifying the EALs in the application?

ROBERT WILLIAMSON: Bob Williamson, emergency planning manager for Reese Dessembler [spelled phonetically]. Right now, the design of the radiation monitors is not complete, so we cannot complete the off-site dose calculation manual. And those calculations are necessary to complete the EALs. So, I mean, you -- the response spectrum of each of the red monitors and the sensitivity are taken in account for the calculations for each of the thresholds for the various classifications.

CHAIRMAN JACZKO: So at what point -- what point do you have -- I mean, what point is that available, then? When do you have that information specified?

ROBERT WILLIAMSON: When the design of the radiation monitoring system is complete.

CHAIRMAN JACZKO: To when the design is complete? So when do -- we don't know that -- is that a site-specific design for --

ROBERT WILLIAMSON: It's still a Westinghouse design, and when the information is available, we will complete the EALs and submit them as required in their Appendix echo of 10 CFR 50.

CHAIRMAN JACZKO: Why is that not available now?

ROBERT WILLIAMSON: It's not part of the DCD.

CHAIRMAN JACZKO: But why isn't it a part of the COL? I mean, I guess that's the --

MALE SPEAKER: Let me -- I think maybe I can add something to clarify the question for you. And I think I understand the concern is, is that we're giving this license, if approved, without seeing the EALs. And my answer would be no, we are not. And the reason is, we have a commitment from them, and a requirement that they develop those EALs in accordance with NEI 07-01, a very specific document, we have zero, specifically. I brought that document with me, it's about 300 pages long, we don't have to go through the whole thing here but just --

CHAIRMAN JACZKO: It's not long, it's just not as exciting.

[laughter]

DANIEL BARASS: Just a random page picked out of it, it shows-- here's the initiating condition for the EAL and then here is the specifics. Steam generator blowdown, BDS-RE-010, which is a moderator -- a specific moderator in the design and it's a site specific value. They don't know that value yet, that's why they can't give us the EALs. They need to build the system, calibrate the systems, to come up with

that site-specific value. When they give us that and plug it in, they'll give us that page with that site specific value filled in and we'll have the EALs --

CHAIRMAN JACZKO: Why don't they just submit those and then amend them later when that value is known?

DANIEL BARASS: There would be duplicate of review effort and all that and it's not really something they need to do at this point, we know it's going to be -- we know how they're going to get it, that's what I wanted to go on to say, not only does it say fill in the site-specific value, but on the next page it has a basis for developers notes that tells them and us specifically, and the public and anybody else that wants to look at it, how they will develop that site-specific value. So they just can't go off and randomly come up with a number, we actually laid out the methodology that they have to use to come to that and what we found agreeable. Further, the --

CHAIRMAN JACZKO: If they don't want to do it that way, it's an inspection finding then, right?

DANIEL BARASS: Well they have to do it that way, that's what their commitment is to do, there's not an option. That's what the license condition is and the license condition is without deviation; they have to follow this without deviation, so they don't have an option there. I wanted to add, just for clarity's sake, this document was not developed in a vacuum, it was developed through an open, collaborative process with public input, comment and all that. So it's a very scrutable process, it's an old process and it's very detailed and

specific, so to say that we don't know the EALs, we know what the EALs are going to look like, we just don't know what that number is, where it says site specific because the system hasn't been built, hasn't been calibrated, you can't know that until it's done.

CHAIRMAN JACZKO: So the broader question I have then gets back to how we did this. As I go through our regs it seems like this is something that should have been included in the emergency plan or the part 50 Appendix E requirements, requires them to specify his part and in through the part 52-79 they're required to specify the emergency plans which includes all the requirements in 50 Appendix E which includes specification of the EALs and this may be a very persnickety question, but I don't quite understand why this wasn't an exemption, that came in and said, for what appear to be very valid reasons, we are not specifying the EALs at this point but there will be a license condition that will specify them later. Am I misreading part 52 that this is a required part of the application or no?

DANIEL BARASS: Our view is that yes, it's required, that they provide a scheme for an EALs and the staff's opinion is that they have provided the scheme and the scheme tells us this is what the emergency classification levels will be. There's four of them and they fit a standard definition that it's NUREG 0654 -

CHAIRMAN JACZKO: It's that part that part 52 requires a provision of the schemes, not the EALs themselves.

DANIEL BARASS: It goes deeper than that, the scheme, it goes down to the EAL level, I would say it hits--

CHAIRMAN JACZKO: Why wasn't there an exemption request then, saying that we're not providing the EALs at this time? That's all I'm trying to understand.

DANIEL BARASS: I guess in our view they didn't need to get an exemption because they provided us the information that says the EALs look like this and we know what they're going to look like, the one thing we don't know is that specific -- site specific value and that will be --

CHAIRMAN JACZKO: So they did then submit EALs.

DANIEL BARASS: Well they submitted a license condition that says the EALs will look like this. So we know what they look like.

CHAIRMAN JACZKO: Well then again maybe I'm just hung up on this and you're probably never going to satisfy me because, it seems like submitting a license condition isn't the same thing, I mean you don't submit license conditions as part of the application. You submit the contents of the application, which would be the EALs. You know, it gets to the point where--

DANIEL BARASS: The content is here, we have the content already, we just don't have the numbers filled in because it's impossible to do at this point.

CHAIRMAN JACZKO: And again, so maybe that's the answer in that it's helpful, maybe it's six and one half dozen whether we review them now or at the license condition so effectively the EALs were submitted, is what you're saying to me.

DANIEL BARASS: Yes.

CHAIRMAN JACZKO: Okay, thank you. Commissioner Svinicki?

COMMISSIONER SVINICKI: I'll begin with a couple of clarificationS from applicant witnesses. Applicant slide 3 describes that there will be a single emergency plan that will include the existing unit, along with the two new units, if approved, could you describe how or the mechanics of how you would phase in new units as they come online into this emergency plan, which -- I guess I'm just trying to understand the approach and process as Unit 2 would come online and Unit 3. How do they get rolled in to the emergency plan?

ROBERT WILLIAMSON: In particular the annexes, each annex will come online so initially when Unit 2 comes online the annex is for Unit 1 and Unit 2 will be applicable and then as we bring Unit 3 online we'll implementing an annex for Unit 3. The unit specific information is contained within those annexes.

COMMISSIONER SVINICKI: So if I am -- Unit 1 -- when Unit 2 is rolled in to the emergency plan, with consideration to emergency plan issues, is that invisible to me, does anything change for me or if I'm Unit 2 and I'm online, and Unit 3 gets rolled in to the plan is there anything that changes about how I approach anything related to the plan in the units that are already online?

ROBERT WILLIAMSON: Well, for example, the emergency response organization will differ from the current Unit 1 emergency response organization as we roll in the passive reactor, it's a dip. We'll have licensed senior reactor operators in the technical support center and in the EOF that will be part of the RO, they're currently not there.

They'll be licensed to the AP1000 technology, in addition there will be technical support personnel or engineers specific to the AP1000 plant that will be rolled in to the emergency response organization as well. If you go further into the emergency plan and each of the particular sections, for instance section two talks about which organization has the lead, so today Unit 1, a standalone unit, Unit 1 has a lead, for an event that involves all units at the site, Unit 1 will be the lead control room. If it's an event that only impacts Unit 2, and these are specified in each annex, Unit 2 will be the lead control room and then as Unit 3 comes online, Unit 3 will be the lead control room, so it's a phased approach as each unit comes online.

COMMISSIONER SVINICKI: Okay, I think I understand that. So a new unit being rolled in to the emergency plan, all these algorithms you're talking about for any thing that has an effect on the units that are already online, that's all laid out when that annex is invoked and in place and -- any differences for the units that are already online are carried forward or understood by just -- I guess what I'm getting to is that if you just add, if would be like adding a new appendix to a document, if it has the effect of affecting other things for the units that are already online, what I'm understanding your answer to mean is that's already taken into account.

ROBERT WILLIAMSON: That's correct.

COMMISSIONER SVINICKI: And for the Summer auxiliary systems, I'm just trying to understand how much commonality there is with the reference COLA at Vogtle. For instance, the raw water and the waste

water systems at the two sites, except for design parameters that are driven by site characteristics and what's at the bottom of my question is that I'm curious about what members of the AP1000 design center, how much coordination is there for items outside of the DCD?

TIMOTHY SCHMIDT: Commissioner, I can answer that. We have had discussions with Southern, in particular with the rad waste interface with the waste water system. How that's double walled, with the rad waste systems piping to the waste water system piping, which is single walled, this concepts, this designs at that level are similar, I do understand the Vogtle site has different topography and so forth on how their blowdown line is routed.

COMMISSIONER SVINICKI: It sounds like there's some level of at least discussion and coordination that attempts to drive some level of standardization, although obviously it's not required. It sounds like there is some effort or attempt at some common design or approach to the systems.

And my other questions are for the staff: Do the ITAAC related to emergency planning require drills and exercises on specified frequencies and if so, what are those frequencies?

DANIEL BARASS: Yes, the frequencies are pretty much laid out in the regulation and there is a biannual, or every two year, exercise, which is evaluated by the inter scene FEMA, which involves the off site and the on site organizations and then in between those exercises there is an on site exercise which exercises, basically, the on site organization. There are also another level below that there are drills

and training things that are conducted -- those things are also laid out in the emergency plan. At what frequency they would have those I don't have those in my mind --

COMMISSIONER SVINICKI: Okay, the Commission recently approved -- although I'm not sure it's all the way through the process of being promulgated -- changes to our EP regulations and so has the staff approached ITAAC and other review and approval steps with an eye towards the implementation of the new EP requirements that the commission has approved or is that something that is yet to be incorporated?

DANIEL BARASS: Of course the EP rules is not yet in place, so we couldn't review the regulations against something that didn't exist yet so the answer is no, we didn't review it against the EP rule change. However, we did provide in the EP rule that is going in the process and the consideration of the COLs and specifically in there it addresses they can either make the changes now and submit them or they can implement them after the rule has changed, and there's a very specific provision in the rule language that addresses that, giving them time frame of when to implement them, and that was specifically done with the understanding of you can't hit a moving target and you have to freeze at some point and do your evaluation. I remember this came in in 2008, long ago, and it was written against the standard review plan that was in place six months before that. So the applicant provided something, we reviewed it, we completed our review work maybe a year or so ago, and it's now getting to the point where we're finalizing it, and

as you know, the rule is still in processing so where do draw the line? We drew the line and then we wrote provisions in the rule that allow to incorporate any changes that do happen and require them to live by those rule changes.

COMMISSIONER SVINICKI: Okay thank you that was the -- that response is helpful.

When I look at the totality of the record on the exchange of REIs and information between the staff and the applicant it appears that there was some interchange on the topic of the off-site grid stability analysis and I don't know which staff witness could speak to this most specifically, but were there differences between the Summer analysis and the one that was performed for Vogtle and if someone could address maybe any kind of novel or unique aspects of the analysis and also if this is an area of -- are there any lessons learned that could be carried forward to subsequent reviews?

TANIA MARTINEZ-NEVEDO: My name is Tania Martinez-Nevedo and I'm an electrical engineer in the Office of New Reactors. I've been sworn in. With respect to the stability studies for the grid, they differ in that site-specific characteristics are factored into the analysis so the contingencies that are looked upon, when the analysis is performed might be similar, but then the site-specific characteristics might be the ones that would differ between the applicants.

COMMISSIONER SVINICKI: Was there anything particularly novel or unique in what was proposed by the applicant in their analysis in this case or was it just a matter of the back and forth was working

through -- just looking at their analysis and performing your review?

TANIA MARTINEZ-NEVEDO: Nothing in particular was different. It's the detail of the results that we were looking that prompted us to ask the questions on unseen, what is the spectrum of the results they had.

COMMISSIONER SVINICKI: Okay, thank you. Mr. Chairman?

CHAIRMAN JACZKO: Commissioner Apostolakis?

COMMISSIONER APOSTOLAKIS: Thank you. The scheduling notes says that there will be no specific presentation from several specific topics, but we can ask questions anyway.

[laughter]

So, chapter 18, intrigues me. Human factors engineering. What issues does human factors engineering deal with in context of the COL? Can you tell me, or the applicant maybe, I don't know.

DONALD HABIB: I was the exemption for the location of the TSE and that has human factors incorporated into that--

COMMISSIONER APOSTOLAKIS: Tell me some of those factors.

DONALD HABIB: -- chapter 18. It was design of the displays in the TSC that they be --

DANIEL BARASS: He's talking TSC and that's my hearing so I'll interrupt him.

[laughter]

Is specifically, in our guidance document, there's a one line sentence that says that the TSC and the EOF will include human factors in the design, specific human factor things. That's all it says. It

doesn't say a lot, so this is a, I would phrase it a gray area, there's not a lot of definition into what it is. I saw Joe to this-- coming to the mic, I don't know if he has anything to add, I don't think we have a human factors expert in the room today, but you want to add something before I go on?

JOSEPH SEBROSKY: This is Joe Sebrosky, I'm the lead safety PM and I am a sworn witness. Most, if you look at chapter 18 you would find most of the material in there is standard, there is one site-specific item and that's the departure that both Don and Dan alluded to. One of the things looked at, and Dan, you can correct me if I'm wrong, is the human factors folks worked with the EP folks to address any PCRS concern. It was an ACRS concern about being-- making sure when you have this common TSC, that you can delineate which unit the information is coming from, that there's a clear delineation on Unit 1, Unit 2 and Unit 3. I believe we have an ITAAC in that area as a result of the interactions with the ACRS. So that's an example of--

COMMISSIONER APOSTOLAKIS: I've got --

JOSEPH SEBROSKY: Your question was human factors and that's what we looked at.

COMMISSIONER APOSTOLAKIS: Something that the ACRS happened to raise is I gather you don't have any systematic way of evaluating the human factor's aspect.

DANIEL BARASS: Well human factors experts, if they were here, maybe could provide you a more thoughtful response to that, but as Joe said, at least in my mind, and I'm not a human factors expert, it

comes down to can the person who's trying to get the information, can he readily get that information without being confused by other information-- you know, that confusion factor and that's what the human factor hopefully looks at, is the information presented in a clear and specific manner so that they know I'm looking at Unit 2 and that's the data and if I need to find something out for Unit 3, can I find Unit 3 data and not get it confused with other-- they have a program for that and it's--

COMMISSIONER APOSTOLAKIS: Thank you.

CHAIRMAN JACZKO: Commissioner Apostolakis, we'll take an action to get back to you on the standard approach and what was looked at, which factors respectively.

AMY MONROE: Commissioner? I'm Amy Monroe. We have a witness who might provide some additional input if it would please you.

DAVE CARROLL: My name is Dave Carroll, I'm the -- [unintelligible]. My name's Dave Carroll, I'm with the South Carolina Electric and Gas, I'm a design engineer in the New Nuclear Informant Group. HFE for the --

CHAIRMAN JACZKO: I'm sorry could you just clarify you've been sworn in?

DAVE CARROLL: I have been sworn in sir, yes I'm sorry. TSC for the TSC and the EOF the only thing that were HFE designed are the displays that are-- the same displays that are used in the main control room. The main control room uses NUREG 0711 as their HFE guide, the TSC and the EOF use the NUREG 696 as their guide for how they do HFE and the

successful completion of the drill is how we determine that HFE is sufficient.

COMMISSIONER APOSTOLAKIS: So there is guidance, that's what you're saying.

DAVE CARROLL: Yes.

COMMISSIONER APOSTOLAKIS: Okay, thank you. In the-- you discussed the off site power, the intent there was not to come up with the frequency of area, was it?

DONALD HABIB: I'm going to defer to the subject matter expert.

TANIA MARTINEZ-NEVEDO: Again, Tania Martinez-Nevedo from NRO. The intent of the rate stability study is to assess whether or not the plant's going to be capable of providing those-- the power to the RCPs for three seconds. It doesn't go to that specific area.

COMMISSIONER APOSTOLAKIS: Thank you. This habit thing confuses me. You said that the ACRS raised the issue about heavy gas effects. Does the staff agree that habit has to be upgraded to include heavy gas effects? Does the staff agree that habit has to be upgraded to include heavy gas effects but then you all agreed that it's okay, I mean this particular control room is okay, I don't understand that. If you are excluding the heavy gas effects, why, there are they not important? Then if they are not important why are you upgrading the code?

JOHN MCKIRGAN: John McKirgan, I'm chief of the ventilation branch and I'm a sworn witness in this proceeding. The basis for both

the staff and the ACRS's finding in this matter are really derived from the applicant's use of ALOHA [spelled phonetically]. The applicant's analysis is the analysis record and that's what we're basing our safety finding on. The staff's use of habit was confirmatory, a habit's a tool, it's been well used by the staff and the industry, it's got a number of features. It also has some limitations and the staff is working to correct those. But it was the nature of ALOHA, in both the staff's and the ACRS's acceptance of ALOHA and its heavy gas model that's the basis for the--

COMMISSIONER APOSTOLAKIS: So you do have it. Okay, okay, thank you. And a final question, responding to prehearing question eight, the staff stated that the licensee, after the EPZ is determined, the licensee would not be required to make any changes to the size of the EPZ should land use change. You also state that if FEMA made a determination that adequate protection did not exist for the citizens of the area, then the NRC would do something about it. How would FEMA do this? What is it that would prompt FEMA to say "Wait, wait, a minute, too many people have come in and there is no adequate protection." I don't understand that thing.

DANIEL BARASS: The emergency preparedness program is not static, it's a very dynamic program and we run drills and exercises throughout the year as we mentioned already in the response to the question, every two years there's an evaluated exercises, there are also required-- by FEMA's requirements they have what's called an annual letter of certification where the off site agency certified FEMA, their

plans are updated they've done the training, they haven't done the things they could.

So there is a process that they go through on a routine basis that they look at things and also there are requirements for the on site program that they audit their program at a certain frequency by outside group, EP group does the audits, to detect whether or not there are changes and if there are things that are identified, then they put them in the correct action program and they fix them. What's not dynamic is the licensing basis, which is what we're establishing today, you set the EPZ and here's a licensing basis and that doesn't randomly change, that's fixed, however if there's--

COMMISSIONER APOSTOLAKIS: I hope nothing changes randomly.

[laughter]

DANIEL BARASS: If there is a growth or a reason to look at something then we look at--

COMMISSIONER APOSTOLAKIS: So what you're saying is there is a process.

DANIEL BARASS: There are processes, would be considered and evaluated, if changes needed then there are processes to get that change effectively.

COMMISSIONER APOSTOLAKIS: Thank you. Back to you sir.

COMMISSIONER MAGWOOD: Before I get to my question, first things first, if we're able to have a discussion, just a few minutes ago, habit versus ALOHA, as I recall ALOHA has some limitations as well, I think it's because it doesn't account for confined spaces, is that

correct?

MALE SPEAKER: Yes, one of the features that the staff likes about habit is that it models the control room, it was developed by the NRC so it's got some capabilities there.

COMMISSIONER MAGWOOD: So when you say that staff's analysis was based on an evaluation of the licensee calculation, that's based on a code that's not entirely accurate for this purpose either, is that?

MALE SPEAKER: No, if I may clarify, what the staff does is looks at the concentrations of the intake to the control room and so if the ALOHA calculations, which are somewhat more robust for those specific chemicals in this instance, if the concentrations of the intake to the control room are below the levels of concern then no further analysis would be needed.

COMMISSIONER MAGWOOD: Okay, thank you. That helped a lot. Also, Commissioner Svinicki asked a question earlier about the exercises required under the ITAAC and we got to a conversation about the biannual drills and the other exercises. As I recall, there's only one exercise under the ITAAC and that's the one full scale that has to take place within two years of fuel load, is that correct?

DANIEL BARASS: I believe that's correct, yes.

COMMISSIONER MAGWOOD: Okay, all right, just wanted to clarify that. Clarification also, I'll direct this to the applicant, I recall someone earlier, perhaps it was Commissioner Williamson that said that the TSC was located between the protective areas and I remember looking at a map somewhere along the way and I thought the TSC was

located near the switchyard, which is sort of off to the east of unit one, can you help me with that?

ROBERT WILLIAMSON: Yeah, Robert Williamson, manager of immersed planning. The TSC is located between the protected areas, it is located to the southwest of unit one and will be located southwest of unit one. We are currently constructing the new nuclear operations building where the majority of our engineering staff will be housed and it will be in the basement of that facility.

COMMISSIONER MAGWOOD: Okay, so it will be geographically between--

ROBERT WILLIAMSON: Geographically in the center.

Commissioner Magwood: Okay, thank you, that helps. Let me start with the staff on this. The TSC confuses me a bit. As I understand, what we heard doing the presentations, the TSC will be a unified facility for all three units. It will be ten to fifteen minutes transit time between TSC to control rooms, outside protected areas, as you were saying, go between the TSC and the control room, you have to go through security. As I understand, this is departure, I went back to look at the origins of all this, which comes out of NUREG 0696, and here's what the NUREG says about the location of TSC. It says "During"-- and this is post TMI, so this goes back aways, but "During this event at nuclear power plants, telephone communication between facilities were ineffective in providing all the necessary management interaction and technical information exchange. This demonstrates the need for face to face communications between the TSC and control room personnel, to

accomplish this the TSC will be as close as possible to the control room, preferably located within the same building, walking time from TSC to control room shall not exceed two minutes." It goes on to say "There will be no major security barriers between these two facilities other than the access control station for the TSC control room." Well, I understand, again, this is a departure but I guess this comes in philosophy, if you're going to have a departure you might as well make it a good one because this really seems, 180 degrees about face with where we were.

DANIEL BARASS: Regulatory requirement is that they have a TSC, and that they can manage and relieve the control room of functions from that. What you're reading from is a guidance document created in 1980, 1981 time frame. We've learned a lot since then and particularly the events that happened in September, 2001, I think it was, right? There are other considerations that we didn't think about in 1980 that we now think about. Also, you look at the equipment capabilities, what was available to us in 1980 time frame, when we were writing these things, back then were nothing like the communications capabilities, the computer capabilities things that we have today. So there's a huge technological difference from then to now. And there are other factors that we now consider important in that. So, having the TSC within very close proximity, when you can have those face-to-face communications, is a good thing, and something there may be occasionally a reason why you want to have that face-to-face communication.

The lessons we learned at TMI was, one, there was too much

face-to-face communication, too many people in their control room, too confusing, so you needed to move them out of there and leave the operatives to do their operation and get that stuff out of the control room. So we did that with the TSC. We have the concern, if you're going to have an event, a B5B-type event, well, you're going, potentially, to have a compromise or a loss of that control room. If you've got the TSC that close to it, now you've lost the TSC also. So there is a strategic, I guess, response, of having the TSC somewhat removed from that. It adds a benefit --

COMMISSIONER MAGWOOD: So do we now have guidance that says to look into TSC a greater distance and two minutes [spelled phonetically] away from the control room?

DANIEL BARASS: In the reg [unintelligible] review plan, the staff did make that position that, using modern communications capabilities, that that [unintelligible] window could be expanded.

COMMISSIONER MAGWOOD: Wait, back up for a second. So what you just said was, because of 2001, we learned that having a TSC too close to the control room is a bad thing. So are we moving all the control rooms, or, excuse me, all the TSCs further away?

DANIEL BARASS: I'm sorry; I'm not understanding the question.

COMMISSIONER MAGWOOD: Well, you just said that, because of 2001, you learned that having the TSC too close to the control room is a bad thing; that's effectively what you just said. So, in this non-matter [spelled phonetically] of having the option of being with two

minutes or a little further, is -- or to be further away than two minutes, correct?

DANIEL BARASS: At this point, I wouldn't say it's better on one place or the other. There are --

COMMISSIONER MAGWOOD: By way of 2001 --

DANIEL BARASS: There are distinctive advantages --

COMMISSIONER MAGWOOD: [inaudible]

DANIEL BARASS: There are distinct advantages in both locations, and I think both are acceptable. We have an existing fleet out there with TSCs that are located in close proximity to them. We are not requiring or making them move those TSCs, although we have required and asked them to identify where they could relocate that to, and have plans in place to do that, should that be necessary. So we've done that. Now, this applicant, and other applicants that have chosen to have a centralized TSC, they've kind of taken that a step further, and now the TSC is actually moved to a different location, which, again, is, in my mind, a good thing, because it's eliminated one of the concerns. It now adds in this factor, okay, if I want to get in there and talk to the control room operators and actually see things, now I've got to worry about a ten-minute commute to get there. So that's a factor. But, adding in the fact that we've got enhanced computer systems, real time data, stuff like that, there may not be that need to be in there face-to-face to have that communication. So, there are trade-offs involved.

COMMISSIONER MAGWOOD: So, I guess I, you know, I guess we

can expect these [unintelligible] talking about the TSC, but it seems to me that part of what -- part of the message I get from looking at the [unintelligible] says that telephone communications and electronic communications, there could be an interruption, you could have a power outage, you could have a, you know, a station blackout, and you could lose those capabilities. And that's one of the reasons you want to have the ability to have that face-to-face communication. And now we have this greater distance. And I -- that's something, you know, I'd like to explore further, but I have 56 seconds left, so I'm going to ask another question.

And that is, just bringing this back at the staff, as I -- if you look at Slide 5 in the staff presentation, you have a map that shows the EPZ. And I think the staff was making, you know, their compassion [spelled phonetically] in Slide 6, and showing that there's this little pocket, which I guess is forced into areas that everyone agreed wasn't worth worrying about, effectively, per terms of emergency planning. But, to the -- make sure I get my directions right, I'm dyslexic when it comes to directions like that. When we look to the east, you start to look in -- you start to move into what I think are basically the suburbs of Columbia, at that range. If you want to extend the EPZ another mile to the southeast, if I'm looking at this correctly, do you start to run into those populated areas? Do you start to pick up some of those suburbs of Columbia?

DANIEL BARASS: I'll let the applicant answer that, I think -- better knowledge of that specific area.

ROBERT WILLIAMSON: All right, if the location that we use [unintelligible] were moved to the southeast, then that would be applicable. But as it's set now, the actual EPZ change, the extra one mile would be to the southwest. And that would only impact the two counties of Newberry and Lexington. As I state in my presentation, the risk populations for Lexington County in particular, they're -- within the town of Chapin, there are four schools, a daycare center, and an assisted living facility that are outside of the 10-mile boundary of Unit 1, but are within the EPZ particularly because they are there.

COMMISSIONER MAGWOOD: And would not pick up any [unintelligible]

ROBERT WILLIAMSON: That's correct.

COMMISSIONER MAGWOOD: Okay. All right. Thank you. Thank you.

CHAIRMAN JACZKO: Commissioner Ostendorff?

COMMISSIONER OSTENDORFF: Thank you. I just have a comment. I [unintelligible] EPZ, and I just would comment that I think emergency planning is an area where it's so important to show proper state and local response organization engagement, and I'm very pleased when I hear that, in looking at this, the addition of two units and how it affects the existing EPZ, that a common sense, pragmatic approach was employed with local stakeholders. So just a comment, not a question.

I do want to ask a question of TSC, but I'll ask this to the applicant. What external events is a TSC designed to withstand?

JAMES LABORDE: It's designed to local building codes, so

it'd be for the hundred year occurrence of wind, flooding. But I'll say it's a hundred year occurrence of just wind and flooding.

COMMISSIONER OSTENDORFF: Does the relocation TSC change the design parameters for any external events it would have had to withstand?

JAMES LABORDE: For the facility?

COMMISSIONER OSTENDORFF: Yes.

JAMES LABORDE: No, it does not.

COMMISSIONER OSTENDORFF: Okay. Let's -- HDPE, I want to stay with the applicant, and I dealt with carbon steel piping for many years, and corrosion [unintelligible] pitting, corrosion with the nuclear propulsion systems, you know, I was very pleased to see the HDPE. I think I understand that this is already being used in a couple nuclear power plants in this country, or maybe in other applications. Can the applicant talk about where HDPE is being used right now in the United States, and if so, and what kind of nuclear applications?

TIMOTHY SCHMIDT: Okay, just, you know, in general industry, HDPE is used in natural gas service, waste order service, and municipal water suppliers use HDPE. You know, fossil power plants have -- use HDPE for a number of years. I think we talked about ACR or ACRS earlier this year, nuclear plants have started using HDPE a little over 10 years ago. And, again, I can't speak to the specific applications, safety, non-safety. I know primarily, you know, there -- this, you know, being addressed right now. Regarding one plant in particular, we talked to -- they replaced their blowdown line with HDPE, just within the last couple

years. Five miles of it. That was one benchmark we used.

COMMISSIONER OSTENDORFF: Okay. Is it -- you have something to add there?

LARRY WHEELER: Yeah, my name's Larry Wheeler. [unintelligible] staff, technical review for Chapter 9. I have been sworn in. About a year ago, I attended a workshop with EPRI. And at that EPRI workshop, there was a discussion in which the Duke power plant has had HDPE in the service squad or non-safety application, and it's been in service for about 13 years.

COMMISSIONER OSTENDORFF: Okay. What do you know, stay at the podium here just for follow-up. I'll ask the question: any comparison on seismic resistance between HDPE and existing carbon steel piping in water applications?

TIMOTHY SCHMIDT: I'm not able to speak to that.

COMMISSIONER OSTENDORFF: Do you have any -- is there any assessment that's in the, you know, with ASME or any industry analyses in this area that you're aware of?

LARRY WHEELER: My understanding is B31 wind code [spelled phonetically] will be utilized for the HDPE installation at the site, and it is not evaluated for seismic.

COMMISSIONER OSTENDORFF: Thank you. Thanks, chairman.

CHAIRMAN JACZKO: Any other questions or comments? Okay. Well, thank you very much for your presentations. And, for the applicant, we will adjourn for today and reconvene tomorrow morning to discuss the environmental issues. Thank you.

(Whereupon, at 5:00 p.m., the above-entitled matter recessed to reconvene at 9:00 a.m., October 13, 2011)

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

United States of America

Nuclear Regulatory Commission

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IN THE MATTER OF DOCKET NO: 52-027-COL and

SOUTH CAROLINA ELECTRIC AND GAS 52-028

COMPANY AND SOUTH CAROLINA PUBLIC

SERVICE AUTHORITY (ALSO REFERRED

TO AS SANTEE COOPER)VIRGIL C. SUMMER

NUCLEAR STATION, UNITS 2 AND 3

Thursday,

October 13, 2011

+ + + + +

Rockville, Maryland

The hearing commenced in Rockville, Maryland, at 9:00 a.m.

BEFORE:

Gregory B. Jaczko, Chairman

Kristine L. Svinicki, Commissioner

George Apostolakis, Commissioner

William D. Magwood, IV, Commissioner

William C. Ostendorff, Commissioner

APPEARANCES:

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

9:00 a.m.

CHAIRMAN JACZKO: Well good morning everyone. Today we'll conclude our mandatory hearing on South Carolina Electric & Gas Company's application for two combined licenses for nuclear reactors at the Virgil C. Summer site near Jenkinsville, South Carolina. At the onset, I also want to remind all the witnesses that they remain under oath and if there are any people who'll be speaking today that are not, not been sworn in make sure they do that before they do make any statements if they do. Today's panels will focus on the environmental review and then we'll hear closing from the applicant, and the staff. We'll begin this morning with an overview of the process for developing the EIS for the project as well as the project's impacts on the environment, land use, air quality, water quality, [inaudible], socioeconomics, health, human health and cultural resources. The presenters will also discuss alternatives to the proposed actions including alternative sites and alternative, energy alternatives. So, again, I would ask all the witnesses seated at the tables to please state their names and title for the record and we'll start with the applicant and then do the staff.

APRIL RICE: Good morning, my name is April Rice. I'm the Licensing Supervisor for VC Summer Units 2 and 3.

STEPHEN SUMMER: Steve Summer, Supervisor, Environmental Searches, SCANA Services.

LISA MATIS: I'm Lisa Matis, I'm with Tetra Tech, Deputy Project Manager for the Environmental Report.

SCOTT FLANDERS: Scott Flanders, Director of the Division of Site

and Environmental Reviews.

RYAN WHITED: I'm Ryan Whited, I'm the Chief of Environmental Projects Branch Two, Office of New Reactors.

PATRICIA VOKOUN: I'm Pat Vokoun, I'm the Project Manager for the Environmental Review of Summer.

JACK CUSHING: Jack Cushing, I'm a Senior Project Manager in the Office of New Reactors.

NANCY KOHN: Nancy Kohn, Pacific Northwest National Labs, I'm with the Deputy for the VC Summer Environmental Review, Deputy Team Leader.

CHAIRMAN JACZKO: Thank you. Now we'll begin with the applicant's brief presentation.

APRIL RICE: Thank you. Good morning Mr. Chairman, commissioners. As the Chairman mentioned we will cover a summary of the environmental review process, highlights of the proposed action, alternatives to the proposed action, and a summary of the cost benefits of the proposed action. Next slide please. Next slide please, thank you.

The ER was submitted to satisfy NEPA requirements in NRC regulations including 52.80 Bravo, and 51.50 Charlie. The ER describes the purpose and need for the proposed action which is to provide the option for construction and operation of two nuclear power facilities to provide additional baseload generation at the VC Summer site. The ER satisfies the NRC environmental regulations contained in 10 CFR 50, 10 CFR Part 51, and Table 1.3-1 provides a comparison of Part 51 requirements to the response of ER Section. The ER was based primarily on NUREG-1555, the Environmental Standard Review Plan. Next slide.

ER Revisions 0 was submitted in March, 2008, with the original COLA. Revision One was submitted in February, 2009. It included information requested from the NRC acceptance review including ecological studies and alternate siting information. ER Revision Two was submitted in July, 2010, and it provided information in response to the site audit REI responses and site layout and transmission line design updates. The staff conducted an intensive week-long site audit and a separate alternative site audit in March, 2009. The site audit involved over 75 people including NRC staff, SCE&G, Vectal, Tetra Tech, and government agencies.

Personnel performed field observations, interviews and data reviews during the audit. Follow up information was provided to the staff via formal correspondence. SCE&G also responded to over 70 NRC and U.S. Army Corps requests for additional information including many part REIs. SCE&G provided supplemental information and clarification from REI responses as requested by the staff or in response to project development. In addition to the staff's outreach efforts in the community SCE&G held open house meetings with community residents to discuss the project status and address questions and concerns. Meetings and site tours have also been conducted with local officials.

Also the Senior Vice-President established a grassroots community coalition to provide a forum for regular and open communications to and from the community. These groups still meet today. Initial consultations with government entities are covered in Appendix A. These consultations have continued throughout the project during the environmental review as well as during permit applications. Next slide.

As covered in the OEF Overview the ER covers the existing site

environment impacts from the project, alternatives and cost benefits. Next slide.

Specifically the ER evaluates the impacts of construction in Chapter Four, and operation in Chapter Five. Impacts are analyzed in a single significance level of potential impact to each resource it's assigned consistent with 10 CFR 51, Subpart A, Appendix B. Small impacts of environmental effects that are not detectable are very minor. Moderate impacts of environmental effects that are sufficient to alter noticeably but not destabilize any important attribute, whereas large impacts have environmental effects that are clearly noticeable and are sufficient to destabilize important attributes. Now Mr. Summer will provide a more detailed impact analyzes.

STEPHEN SUMMER: Next slide. Construction impacts. The construction land use impacts were evaluated as small, except for transmission rights-of-way which was moderate. Transmission impacts were evaluated as potentially moderate due to land use changes. SCE&G and Santee Cooper were able to cite the majority of the transmission lines on existing rights-of-way. Mitigation for transmission right-of-way impacts will be obtained through the use of best management practices and through the U.S. Army Corps of Engineers 44 Permit Process. Construction water related impacts were all evaluated as small. For construction water use the water will be provided by a local water system and from withdrawal from Monticello Reservoir. Construction ecological impacts were all evaluated as small. In the case of threatened endangered species construction impacts there are no Federal threatened or endangered species identified on site in Monticello Reservoir or Parr Reservoir. Next slide please.

I continue with the construction impacts. Socioeconomic impacts were evaluated as small except for economy which was small to large but beneficial, taxes which was small to large but again beneficial, and transportation which was moderate due to increased local traffic during peak hours. Transportation impacts are being mitigated by actions such as staggered shifts and installation of turn lanes and a planned traffic light at the site entrance on Highway 213. Traffic patterns are being monitored by SCE&G and the South Carolina Department of Transportation and actions will be taken as needed. In the case of historic and cultural resources the ER evaluated the impacts as small. An example of a preempted mitigation was the delineation and fencing of a cemetery which contains a grave of and monument to John Pearson, a Revolutionary War soldier. The final environmental impact statement evaluated construction impacts as moderate primarily due to alteration of landscaping environment. Next slide please.

Operation impacts. Land use impacts were evaluated as small. Water use impacts were evaluated as small. Operational water use impacts will be primarily due to the evaporation of water from the coolant towers. Ecological impacts were evaluated as small. Next slide please.

Continuing with operational impacts, socioeconomic impacts, all impacts were evaluated as small except for three areas. Economy which was evaluated small to moderate but beneficial, taxes which was evaluated as small to large but again beneficial, and transportation which was evaluated as small to moderate due to increases in localized traffic during peak hours. In the area of historical and cultural resources SCE&G and Santee Cooper have signed agreements with the South Carolina State Historic Preservation Office which

addressed the identification and preservation of historic and cultural resources on the Summer Station Unit 2 and 3 site as well as the associated transmission line carbs. Ms. April Rice will discuss alternatives. Next slide.

APRIL RICE: ER Chapter 9 examines the alternatives to the proposed action including alternate energy sources and sites. The no action alternative is for the NRC to not issue the COLs for the new units. This alternative, in this alternative the proposed project would not be constructed or operated. The companies would lose the benefits of power being provided at this site. In addition, the companies may not meet the need for power, it would be a lower reserve margin, the power from -- a power from alternate sources could be more expensive. The companies would have a less diverse fuel supply portfolio and air quality would be impacted if current traditional sources of generation are used. Ultimately the companies would need to implement energy alternatives and construct on an alternate site. Next slide please.

The ER evaluated a number of energy alternatives for the proposed action including alternatives that do not require new generating capacity such as purchase power, extending the life of existing units and implementing demand site management. We also looked at alternatives that provide new generating capacities such as wind, solar, hydro, geothermal, biomass, coal and gas. A more detailed evaluation was done for reasonable alternatives that are considered viable based load power sources in South Carolina and that was performed for coal fired and gas fired options. SCANA concluded that there are no environmentally preferable energy alternatives. The reasonable alternatives would entail significantly greater environmental impact pact to air quality.

Next slide.

Alternative sites. At the initiation of the project in 2005, SCANA performed an alternate site evaluation. The region of interest for the site selection was originally the SCE&G service territory in an area within 15 miles of that service area since Santee Cooper was not a partner at the time. SCE&G conducted several siting studies in the course of the project. Ultimately 20 potential sites were assessed for suitability. ER Section 9.3.2.3 describes the screening process used to identify candidate sites as follows.

The 20 sites were first evaluated using exclusionary criteria to eliminate sites that posed significant issues that would preclude the use of the site for a nuclear power plant, for instance, geotechnical issues caused significant impacts or degradation of local natural resources on the site or posed significant impacts to terrestrial and aquatic ecosystems. The exclusionary criteria presented in ER Table 9.3-1, based on this evaluation nine sites were eliminated. The remaining 11 sites were then screened against the EPRI Siting Guide in order to rank them in terms of suitability. The screening level criteria were divided among 10 categories and weighted by relative importance. These categories included cooling water supply, flooding, hazardous land uses, ecology, wetlands, and geology. Each site was assigned a score of one least suitable, to five most suitable for each criteria based on the site suitability metrics in ER Table 9.3-2. The sites receiving the highest score were subjected to more detailed analysis in 9.3. Five sites remained after this evolution. The VC Summer site, the Savannah River site, a Greenfield site, a Saluda site, the Cope site, and another Greenfield site Fairfield One. At the conclusion of the detailed evaluation for each

alternative site it was determined that there were no obviously superior sites and the VC Summer site had notable advantages such as being fully characterized in the ecology and seismology area as well as having existing infrastructure. Now Ms. Lisa Matis will present the cost benefits of the project.

LISA MATIS: Next slide please. The benefits of the proposed action are addressed in ER Section 10.4.1. Principal benefits include satisfying the need for additional base flow generation identified in the integrated resource plan. The two AP1000 units would generate approximately 16 to 18 million megawatt hours per year depending on the capacity factor that is achieved. Expanding nuclear generation capacity increases fuel diversity. Units 2 and 3 provide an alternative to increase use of natural gas to generate electricity. New nuclear plants provide price stability that is not available from generating plants fueled with natural gas. Unlike electricity generated with coal and natural gas, nuclear energy results in minimal emissions of those air pollutants associated with global warming and climate change. Next slide please.

Continuing with the benefits. Regardless of which reasonable energy alternative one compares to nuclear power, Units 2 and 3 would represent a significant benefit in emission reduction or emission avoidance assuming that fossil plants would be constructed to satisfy the need for base flow generation in the event that proposed nuclear plants were not. Emission estimates were presented in the evaluation of coal and natural gas energy alternatives in ER Section 9.2.3. There would be substantial economic and tax benefits. The economic benefits would include up to 3,600 direct jobs at the peak of construction. Operation of Units 2 and 3 would create 2,500 new jobs in the 50

mile region of the plant. That figure's based on an operations workforce of 800, and an estimated 1,700 indirect jobs as a result of economic multiplier effect. Those operations jobs would be maintained throughout the life of the plant. Tax revenues would be generated from taxes on worker earnings and from sale and use taxes, property taxes, and corporate income taxes paid by the utility, for example SCE&G negotiated fees in lieu of property tax during the operation of Units 2 and 3 were ranging from 50, excuse me, from $14 to $31 million annually. SCE&G corporate income tax payments are estimated at $89 million to the Federal government and $15 million to the State of South Carolina each year during operations. Again these tax payments would continue over the life of the project. Next slide please.

Cost of the proposed action are addressed in ER Section 10.4.2. There would be monetary cost associated with the construction and operation of the two AP1000 units. There would be unavoidable impacts in several resource areas. As Mr. Summer addressed earlier impacts for construction and operation of Units 2 and 3 are primarily temporary such as during construction, are small, or can be mitigated.

Section 10.2 of the ER addresses the irretrievable commitments of resources. The largest quantity of materials would be committed to the project, are materials for construction such as concrete, structural steel rebar. The ER assessed the quantities of materials required and although the material quantities were large the amounts are consistent or typical with other large construction projects would have a small impact on the availability of these resources. The ER also considered the uranium that would be used to fuel the plants over their operating life concluded that it would have a small

impact on the availability of uranium worldwide. There would be radiological emissions impacts to workers and to members of the public during the operation of the new units. The occupational radiation dose is obtained from the AP1000 DCD. Maximum exposed individual and population doses were obtained with site specific calculations. Projected doses are well within the applicable regulatory limit and would have a small effect impact.

In summary most of the adverse environmental impacts would be small and in many cases temporary while the benefits are substantial and long term. The cost benefit analysis and the environmental report concluded that the benefits of the proposed VC Summer Units 2 and 3 would outweigh the estimated monetary and environmental costs. This concludes our presentation.

CHAIRMAN JACZKO: Thank you. I'll now hear from the staff.

PATRICIA VOKOUN: Good morning. This morning's presentation will provide an overview of the staff's environmental review for the VC Summer combined license application. My name is Patricia Vokoun and I am the Project Manager for the Summer Environmental Review. With me today are Scott Flanders the Director of the Division of Site and Environmental Reviews in the Office of New Reactors; Ryan Whited the Chief of Environmental Projects Branch Two; Jack Cushing, Senior Project Manager in the Environmental Technical Support Branch of the Office of New Reactors; and Nancy Kohn, the Deputy Team Lead at NRC's contractor Pacific Northwest National Laboratory.

I'm going to begin with a brief overview of the framework that the staff uses to conduct the environmental review and a summary of how this process was applied to the Summer review. Nancy will then discuss how the staff performs its review and some of the key technical disciplines. Finally,

Jack will discuss the staff's process for analyzing alternatives and will present the environmental conclusions. Next slide.

The National Environmental Policy Act also known as NEPA requires Federal agencies to use a systematic approach to consider environmental impacts. An environmental impact statement or EIS is required for major Federal actions that may significantly affect the quality of the human environment. The NRC regulations that implement NEPA are found in 10 CFR Part 51. The NRC has determined that the issuance of a combined license is an action that requires an EIS. An application for a combined license must contain an environmental report. The environmental report provides input that the NRC staff evaluates in preparing the EIS. Detailed guidance for conducting the environmental review is found in NUREG-1555, the environmental standard review plan and recent update. The staff provided supplemental guidance to the environmental standard review plan in a December 2010, memorandum. This guidance adjusts certain aspects of the environmental reviews for a new reactor applications that were identified during the first several reviews of early site permit and combined license applications. Additional guidance is found in numerous regulatory guides and in interim staff guidance documents. Next slide.

In accordance with NEPA and the requirements of 10 CFR Part 51, the staff prepares environmental impact statements based on its independent assessment of the information provided by the applicant and information developed independently by the staff. The staff analysis uses a systematic approach to integrate information from many scientific and technical fields. Before developing the draft EIS the staff issues a Notice of Intent to conduct

scoping and invite public participation. The intent of the scoping process is to identify issues important to stakeholders that should be considered in the staff's environmental review. The staff provides opportunities for interested stakeholders as well as the general public to participate during the scoping period. The staff then conducts a detailed environmental review through audits of the proposed and alternative sites, development of requests for additional information, confirmatory modeling and analyses and the development of independent information through interviews with stakeholders, review of relevant databases and maps, and other methods. The draft EIS summarizing the staff's findings is filed with the Environmental Protection Agency and is issued for public comment. The staff considers all comments received on the draft EIS and describes the manner in which comments were dispositioned in Appendix E of the final EIS. Involvement of stakeholders is a key aspect of the staff's review process. In addition to the public meeting and government interactions that are conducted during the scoping period the staff holds public meetings following publication of the draft EIS to solicit stakeholder comments. The staff also conducts consultations with the Fish and Wildlife Service, National Marine Fisheries Service, interested tribes, and the state historic preservation officer as required by the Endangered Species Act, the National Historic Preservation Act, and other laws. For the Summer environmental review staff conducted additional outreach activities which will be discussed as part of the environmental justice presentation later this morning. Next slide.

The NRC staff evaluates environmental impacts in the EIS by using the impact category levels of small, moderate or large. Definitions of each

category are shown on this slide. Next slide please.

The NRC staff evaluates environmental impacts in the EIS by using the impact category levels of small, moderate, or large. Definitions of each category are shown on this slide and indicate whether an impact is noticeable and whether it could potentially alter or destabilize important attributes of a resource. This framework for categorizing impacts helps to explain the effects of the project consistently for each of the resource areas analyzed in the EIS which are shown on the following slide. Next slide.

This slide depicts the resource areas that were considered in the environmental review. The environmental review team was composed of more than 40 experts at the NRC and the Pacific Northwest National Lab. The team spent more than a year performing analyses and preparing the draft EIS. Once comments were received on the draft EIS we spent nine months responding to comments and preparing the final EIS. I'll now turn the presentation over to Nancy to discuss the staff's technical review in a little more detail.

NANCY KOHN: Thank you Pat. I am Nancy Kohn of the Pacific Northwest National Laboratory. I'm the Deputy Team Lead for PNL since December 2008. I was [inaudible] before the scoping Notice of Intent was issued. As Pat described this review was an interdisciplinary effort that took a great deal of teamwork and coordination. The experts look at the effective environment for each of the resource areas shown, that were shown on the slide and this includes the socioeconomic and cultural environment as well as the natural environment. They assess how and to what degree a resource would be affected by constructing and operating Units 2 and 3 as proposed by the applicant. We also consider environmental impacts that would occur during or

after operation such as impacts associated with uranium field cycle, waste disposal, transportation of fuel and waste, and decommissioning. Now I'll briefly describe the construction and operation impacts on environmental resources. Next slide.

The impacts from construction and operation of VC Summer Units 2 and 3 were found to be small for the following environmental resources, water use and water quality which looks at impacts on both groundwater and surface water resources; aquatic ecology which looks at impacts on fish and other aquatic biota; meteorology and air quality which includes impacts from ducts, equipment and vehicle emissions, and removing of heat and moisture from the cooling towers; radiological health which considers radiological exposures to plant workers, the public and wildlife; non-radiological health which includes public and occupational health impacts; postulated accidents which considers the radiological consequences of design basis accidents and the environmental risk of severe accidents; and finally the uranium fuel cycle including waste disposal, transportation of radioactive material and decommissioning at the end of the operating life of Units 2 and 3. Next I'll present in a little more detail the resource areas were impacts were not small. Next slide please.

Land use impacts. Land use impacts includes the effects of land clearing for plant construction and related onsite services and clearing associated with transmission line corridor development. Six new transmission lines would be needed to distribute power from Units 2 and 3. These new lines have a combined length of almost 400 miles. Most of the new transmission lines would be located within existing corridors but 39 miles of existing corridor would need to be widened and about six and half miles would be new corridor.

Impacts include conversion of land uses for example agricultural to industrial use or changes to land covers such as clearing forests and converting it to open fields. The areas affected by the proposed utilities including the transmission lines were overlaid onto satellite imagery depicting existing land uses and cover types. The basis for the impact assessment is the change in acreage of each land use or land cover type within the affected area and relative to the surrounding region. On the Summer site itself the impacts were determined to be small for both construction and operation because land use and land cover had already been significantly altered as a result of Unit 1 construction. The offsite impacts were found to be moderate because of the conversion of land use and land cover in new and expanded transmission corridors. Land use changes would be minor once construction was completed therefore the impact of operation on land use would be small. Next slide please.

In the Office for Terrestrial Ecology involves reviewing site specific and regional data related to protected species, migratory birds and other important species, wetlands and unique habitats. Potential impacts during construction and operation include disturbance, displacement, habitat loss, [inaudible] collision with equipment or cooling towers and the effects of increased traffic and noise, dust, outdoor lighting and cooling tower drift. Impacts of construction on terrestrial resources on the Summer site would be small but impacts would be moderate where new transmission lines are built. The greatest potential for noticeable terrestrial impacts would be from clearing forests in and adjacent to existing corridors and in the six and one half miles of new corridor. This results in permanent loss of forest habitat

in the corridors and fragmentation of adjacent forest habitat. The impacts of operating the proposed facilities and transmission lines would be small. An important part of the terrestrial ecology review is the consultation, consideration of potential impacts to federally listed threatened or endangered species. Under Section VII of the Endangered Species Act, Federal agencies are required to ensure that their actions do not jeopardize the continued existence of the listed species.

NRC and the Corps of Engineers conducted a joint consultation and prepared a biological assessment for the U.S. Fish and Wildlife Service. This biological assessment addressed potential impacts on 12 potential species, protected species, including one fresh-water mussel. It also addressed critical habitats for the fresh-water mussel. NRC and the Corps, determined that the project may affect but is not likely to adversely affect the listed species for critical habitat. The U.S. Fish and Wildlife Service concurred with these determinations. Next slide, please.

The socioeconomic review examines how local and regional communities are affected by the proposed action. The analysis involves collecting data on the local economy, taxes, infrastructure, education and other relevant business and economic statistics.

The staff also met with stakeholders familiar with the economic and social services in the region. They do this to seek insight into the magnitude of the expected impacts and to determine the regions ability to absorb the impacts of the proposed action.

The beneficial impacts would be small during construction and small to large during operations. The large beneficial impact is based on property

tax revenues of Fairfield County over the 40-year license period. Other beneficial impacts to the Columbia area economy include 3,600 direct construction jobs and 800 direct operations jobs along with several thousand more indirect jobs.

The adverse socioeconomic impacts ranged from small to moderate. The moderate impact is associated with the local traffic impact in the Jenkinsville area during peak construction employment when several thousand workers would be traveling local roads. Those are the socioeconomic impacts on the local and regional communities in general.

Later this morning, we'll present our environmental justice review which focuses on the physical and socioeconomic impact of the project on minority or low income populations. Next slide, please.

The last resource area that I'll touch on is cultural and historic resources. This analysis involves reviewing known cultural resources that may occur near the Summer site, historic properties, archaeological sites, cemeteries, historic architecture and other similar resources to determine impacts related to the proposed project.

Potential impacts on cultural or historic resources include damage through inadvertent discovery as well as visual impacts from nearby clearing new buildings or transmission lines or towers.

As part of the cultural and historic resources review, the staff contacted the South Carolina State Historic Preservation Office, the Advisory Council on Historic Preservation and four American Indian tribes and also reviewed historical records.

Impacts on cultural and historic resources on the Summer site

during construction would be moderate because the clearing and grading and placement of various buildings would noticeably alter the visual landscape near the General Pearson Cemetery and the Daughters of the American Revolution monument that are fortunately on the slide. These are near the -- these resources are located near the intersection of several access roads and the disposal area.

Impacts on cultural and historic resources during operation of Units 2 and 3 would be small. The EIS addresses NRC and Corps of Engineers consultation responsibilities under the National Historic Preservation Act as well as NEPA.

To ensure continued protection and management of cultural and historic resources in the project area, including the transmission corridors, the state has entered into management agreement between the Corp of Engineers and each utility, SCE&G and Santee Cooper.

These management agreements formalize the protection and avoidance measures to be taken by the applicants. They were completed and signed in January of 2011. This concludes the presentation project of specific environmental impacts, and now Jack Cushing will take you through the remainder of the environmental review.

JACK CUSHING: Thank you, Nancy. Next slide, please.

Cumulative impacts of the impacts of the proposed action added to the effects associated with past, present and reasonably foreseeable future actions.

Staff evaluated the impacts of Units 2 and 3 in addition to the proposed and existing projects such as Summer Unit 1 and the Fairfield pump

storage facility that could impact the same resources. Overall, the cumulative impacts on the proposed majority of resource areas would be small; however, cumulative impacts to air quality would be small to moderate due to the impact when greenhouse gases from sources other than the proposed project.

The cumulative impact to terrestrial ecology and land use would be moderate due to the transmission lines. Most socioeconomic impacts were small, however, and the beneficial impact to Fairfield County would be large due to the tax revenue.

There is a moderate socioeconomic and environmental justice impact due to the traffic during construction. There was a moderate impact to cultural resources due to the visual impact in the General Pearson [spelled phonetically] Cemetery. Next slide, please.

The staff evaluated in detail the reasonable alternatives that could meet the purpose and need to provide additional baseload power to capacity within the service territories of SCE&G and Santee Cooper by 2016 and 2019. An alternative was not considered reasonable if it could not meet this purpose and need for baseload power.

The reasonable alternatives would then compare to the proposed action of constructing and operating two AP1000s at the VC Summer site to determine if there was an environmentally preferable or obviously superior alternative.

The staff evaluated the no-action alternative, alternative sites, alternative energy sources and alternative system designs. In the no-action alternative, the NRC would not issue the combined licenses. The impacts and benefits of the project would not occur. The no-action alternative would not

meet the need for baseload power and is, therefore, not a reasonable alternative.

The staff evaluated alternative system designs, including alternative heat dissipation systems, circulating water systems and alternative water sources. The alternative system designs are not environmentally preferable to the proposed system designs because the proposed system designs make small impact on the resources. Next slide.

This slide shows the process for identifying alternative sites. The process starts with the applicant identifying the region of interest or the area where they plan to deliver the power. The applicant then identifies potential sites within or adjacent to the region of interest.

The potential sites are screened to identify the candidate sites. The candidate sites were evaluated using ranking weighting factors to ensure that the alternative sites selected were among the best sites available in the region of interest.

The applicant identified the Cope [spelled phonetically] generating site and the Saluda site and a site located at the Savannah River site as alternative sites. The staff, during its audit, renewed the applicant site selection process and determined that the FA-1 site should also be included as an alternative site because of its proximity to the Summer site and is used for the same resources, resulted in a close ranking to the other alternative sites. Next slide, please.

The FA-1 site shown on this slide is a Greenfield site located close to the Summer site. The Cope generating site is a Brownfield site that has an existing coal plant. The Saluda site is Greenfield's site, located on

the Saluda River arm [spelled phonetically] of Lake Murray.

The Savannah River site is a DOE facility, and the alternative site is located on the Savannah River site near the Aiken-Barnwell county line. Next slide, please.

The staff has contractors visit each of the alternative sites, as well as the Summer site, to gather information to aid in its determination of whether or not an alternative site is an environmentally preferable or obviously a superior site.

The staff compared the impacts of building and operating two AP1000s at the Summer site and at each alternative site. While there were differences in impacts to the various resource areas between the Summer site and the alternative sites, none of the alternative sites were environmentally preferable to the Summer site. Next slide, please.

In order to be a reasonable alternative, the energy alternative must be able to supply baseload power within the time frame of the project. The staff evaluated alternatives that do and do not require new generating sources.

For alternatives that do not require new generating capacity, the staff evaluated purchasing the needed power, extending the life the existing plants, reactivating retired plants or implementing conservation and demand site management programs and determine that they were not reasonable alternatives to meet the baseload power need.

For alternatives requiring new generation, the staff evaluated coal, natural gas, wind, solar, hydropower, geothermal, oil, fuel cells, biomass, any combination of energy alternatives.

Only coal and natural gas have the quantity and capacity factor to meet the baseload power needs and are reasonable alternatives. The alternative energies other than coal and natural gas could not, by themselves, meet the required baseload power; however, a combination of alternative energies with combined-cycle natural gas is capable of meeting the baseload power of the proposed Summer Units 2 and 3.

None of the reasonable energy alternatives -- coal, natural gas or a combination of alternatives -- were found to be environmentally preferable to the nuclear plants. The distinguishing impacts are primarily related to emissions from the alternate -- alternative generation sources.

A nuclear plant has less impact on air quality and emits less greenhouse gases than coal, natural gas or the combination of alternatives. Next slide, please.

In summary, the staff concluded that the no-action alternative was not a reasonable alternative. Additionally, the staff concluded that no alternative energy source, alternative site or alternative system design was environmentally preferable. Next slide, please.

The EIS documents the adverse impacts that would occur if the licenses were to be granted. This slide summarizes the principal resource areas that would be adversely affected from the construction and operation of the proposed project at the Summer site.

There would -- land be -- land would be committed for the use of the site and for the transmission lines. There'd be increased water use, temperature and concentration of chemicals in the discharge. Less than an acre of wetlands would be filled. There'd be habitat disturbance associated with

the construction and operation, including the transmission lines. They'd be temporary, highly localized traffic impacts that would occur in the Jenkinsville area, an Environmental Justice community. Cultural resources would be altered from the proposed action in the insulation of transmission lines. Next slide, please.

The staff identified the following principal resource commitments that would essentially be permanent impacts of the proposed action that could not be mitigated. There'd be land committed to the disposal of radioactive and nonradioactive waste. It's committed to that use and cannot be used for other purposes.

Cooling water would be lost to consumptive use, evaporation during operation. Wetlands would be filled. There'd be a visual impact to the cultural resource attributes. The availability of uranium ore and existing stockpiles of highly enriched uranium in the United States and Russia that could be processed into fuel is sufficient so that the irretrievable commitment of this resource would be negligible. Next slide, please.

The most notable benefits of the proposed action are economic in nature or related to the economic productivity of the Columbia/South Carolina region. There'd be 16 to 18 million megawatt hours of electricity generated annually; $860 million in property tax revenue to the Fairfield County over the 40-year license period; 3,600 direct construction jobs with a peak benefit of 3,800 indirect jobs; 800 direct operation jobs with a benefit of 1,700 additional indirect jobs; $200 million in annual total income to the Columbia economy during operation. There'd be increased electric system reliability and fuel diversity. Next slide, please.

The most notable costs of the proposed action are economic, social and environmental in nature and would be born primarily by the customers of the applicant.

There'd be an estimated $7 billion in overnight capital costs; estimated $576 million in transmission system upgrades, including new corridors; $37 to $42 per megawatt hour of levelized operation and maintenance costs; small environmental impacts to most resources; moderate impacts to land used, traffic, environmental justice and cultural resources.

The NRC staff's recommendation to the Commission related to the environmental aspects of the proposed action is that the COL should be issued. The basis for this recommendation includes most of the environmental impacts will be small; none of the reasonable alternatives will be environmentally preferable; the short-term use of the environment from the production of electricity enhances the long-term productivity of the region and would not be equal by any other use of the site.

On the basis of the assessment summarized in the EIS, the construction and operation of the Summer Units 2 and 3 would have accrued benefits that are expected to outweigh the economic, environmental and social costs.

The staff, after a thorough review of the environmental impacts of constructing and operating two AP1000s at the VC Summer site, recommend that the combined licenses be issued.

This ends our presentation. Thank you. We look forward to your questions.

CHAIRMAN JACZKO: Well, thank you. My first question will probably

be both for the staff, but I'd ask the applicant first. You know, we do a lot of these environmental impact statements on a lot of these projects, and I think what we do is a little bit different from what other people do. You know, if you're Department of Transportation and you're building a highway, a federal highway or a state, and you're building a state highway, and you've got comparable issue to NEPA, the -- really, the actual kind of full action, in a way, rests with the -- with the government entity.

And so ideas like "alternatives" means something different. I mean, the federal government is trying to build a highway somewhere and -- alternatives, they can look in different places. I mean, we have the decision to license or not license. It's kind of binary in that -- in that sense.

You all then have to figure out, well, where you want to put this thing; so then I guess in that sense, we could tell you we don't like a site, but we can't tell you, you know, "You need to go buy this land in this location and build a nuclear reactor there."

So it -- it's a little bit of an awkward thing. So I -- you know, I think to some extent there's -- you know, it always looks a little weird because of that. I mean, there's some extent to which it's not -- you know, it's kind of odd, but --

One of the -- one of the things that I always find interesting is the alternatives analysis, and maybe you can talk to me a little bit more about your environmental reporting. When you did your environmental report and you kind of weigh the costs and the benefits, I mean, what's the answer? I mean, is it significantly beneficial? Is it just marginal? Or how does it kind of work out? I mean, is there a way to kind of combine them?

APRIL RICE: Let me ask that you clarify the question. Are you talking about the alternative sites compared to the VC Summer site or the --

CHAIRMAN JACZKO: Well, maybe I think the overall -- I guess the overall assessment of the project as cost beneficial. Let's say that -- or I mean, I guess -- or you can answer both maybe.

APRIL RICE: Okay. Well from an --

CHAIRMAN JACZKO: And I've got a follow-up; so we'll see where that goes, but --

[laughter]

APRIL RICE: From an overall project perspective, that is what we're trying to balance, and Chapter 10 of the ER is the overall cost versus the overall benefit. And as we've tried to summarize, the costs are relatively small from an environmental side. Moderate actions can be mitigated. The benefit that we see to the state of South Carolina to the company as well is, you know, safe, reliable, emission-free, cost-effective power. So that's what we've tried to portray in Chapter 10 of the ER.

CHAIRMAN JACZKO: And so and this is -- you know, and this is why I think I'm asking you this and not the staff because this is probably more a question for you -- so why aren't more people doing this? I mean, it seems like if they're -- if these things are so overwhelmingly there, why don't we have 30 reactors lined up to construct right now? I mean, there's got to be some other cost there that somehow -- maybe it's not on the environmental side?

APRIL RICE: I can give you my perspective.

CHAIRMAN JACZKO: Yeah.

APRIL RICE: I mean, building a nuclear power plant, you need an

experienced staff to build and operate. It's not a venture that a local small utility might undertake. You need capital and the wherewithal to raise the funds; but in the end, it is very cost-effective.

You know, when we did our Need for Power studies, we found that nuclear power is much more cost-effective than solar or wind, for instance. They're just not proving yet, and they can't provide the baseline power that we need. So I hope that helps.

CHAIRMAN JACZKO: You know, that's fine. I mean, as I said, you know, I don't know if there's really a right answer here. Just -- we -- you know, I think we put a lot of effort into these analyses, but I, you know, I don't know that we're ever going to come out with an answer in our EIS that said, "This is not an acceptable alternative." I mean, I just --

APRIL RICE: [inaudible]

CHAIRMAN JACZKO: -- I don't see us -- I don't know that that's within our --

APRIL RICE: It's not in our --

CHAIRMAN JACZKO: -- within our scope, really, to do it, I guess.

APRIL RICE: If I can add one more comment --

CHAIRMAN JACZKO: Yeah.

APRIL RICE: I think the staff, in their review, they're very thorough --

CHAIRMAN JACZKO: Yeah.

APRIL RICE: -- and they ensure -- like in our instance of alternate sites that --

CHAIRMAN JACZKO: Yeah.

APRIL RICE: -- initially, we looked at two sites, Savannah River and VC Summer. They didn't feel that met the NUREG requirements --

CHAIRMAN JACZKO: Yeah.

APRIL RICE: -- and so we worked to satisfy those needs --

CHAIRMAN JACZKO: Yeah.

APRIL RICE: -- so they helped us to look at a very broad range and do a very rigorous -- and a very rigorous siting study.

CHAIRMAN JACZKO: Yeah. Well, you know, and as I said, I mean, I think this is an interesting conundrum, and I don't know. Maybe somebody in the staff site can answer this, I mean, but let's say we enlighten [spelled phonetically] the Summer site from an environmental perspective. I don't know that we have the authority to deny that. I mean, would we be able to say, "You can't build at that site"? I mean, because it's not -- and we don't have regs. Even our setting -- I mean, if it wasn't a safety issue -- let's say it was a -- you know, strictly an environmental issue. We couldn't deny the site, could we? I mean, somebody else would have to do it like Fish and Wildlife, if there was an endangered species or something.

SCOTT FLANDERS: Yeah. In the past, we've faced this situation like when we were licensing plants, maybe back in '70s, and there were situations where we identified through our environmental review that there were sites that we thought weren't the best --

CHAIRMAN JACZKO: Yeah.

SCOTT FLANDERS: -- generally driven by a population determination. In those cases, we would essentially notify the applicant of our concerns relative to the site.

[talking simultaneously]

SCOTT FLANDERS: [inaudible] because that's [inaudible] option, but in terms of [inaudible] standpoint --

[talking simultaneously]

CHAIRMAN JACZKO: [inaudible]

SCOTT FLANDERS: -- right. I mean, from a population standpoint, that's a safety issue.

CHAIRMAN JACZKO: I mean, we're worried about was it a dose kind of thing --

SCOTT FLANDERS: Actually --

CHAIRMAN JACZKO: -- we're worried about or something different?

SCOTT FLANDERS: Actually, in the case that I'm thinking of -- I mean, it goes back to the Perryman site, just north of Baltimore. Yeah. It was in the early '70s. Actually, it was focused more on the environmental -- it was actually part of a NEPA review that we identified our concern about population although it's very closely tied to the Part 100 siting criteria --

CHAIRMAN JACZKO: Right.

SCOTT FLANDERS: -- issue, but that was an example where it was a NEPA review which drove that determination. But you're right. In terms of the hard radioation [spelled phonetically] that says "No, you did not," it's more of a, you know, expression of our -- of our concerns relative to the site and the decision on the part of the applicant.

CHAIRMAN JACZKO: Yeah. Well, I think that's helpful to and I mean, that's something that we lose sometimes with the EIS is that we're not -- I mean, we have the licensing action, per se, but, you know, I mean, he talked

about the fresh-water mussel. I mean, it's ultimately Fish and Wildlife or some other authority that would have to step in and prevent the permit or something else because there was a significant enough environmental impact, but we wouldn't independently have that authority, kind of, as I understand.

But in any case, I want to turn to another issue. I appreciate this. This is very helpful for me.

And this is it for the staff. I mean, you referenced the definition of "small" in your presentation. And it's not the definition of small we use for "severe accidents." I mean, severe accidents definition is the smallest, low probability of that. It's not whatever the -- I'm trying to remember whatever that is, you know, you referenced as the definition of "small."

And I am probably never going to win on the battle with 20, 30 years of all the legislative and legal history of NEPA; but I guess I just got a -- and Scott this a question I asked you yesterday --, I mean, there are times when, by "small," we don't mean that the effect is non-detectible or so minor it will neither destabilize [unintelligible] attribute to the -- attribute to this resource; we also mean that it's very low likelihood.

SCOTT FLANDERS: Everything that's principally for the most part -- to answer your question, yes. For the most part, that criterion is used in looking at all impacts and all resource areas.

Severe accidents are unique, and we do talk about it in the context of a risk probability and weigh the consequence. And that's consistent with guidance that was actually promulgated many years ago in the early '80s when we first started considering how we look at severe accidents and then also

included in the [unintelligible] and policy statement issued in '85, '86. So in that context, in some of the thinking behind that --

CHAIRMAN JACZKO: Let me -- I'm sorry. I mean, I just want to get in something else here because of the point -- I mean, I kind know where I -- like I said, I don't want to re-litigate years and years and years of that decision; but from the standard point of the EIS -- and as I looked, and I had looked in more depth at the Vogtle EIS than I have it this one -- it seems that we can do a better job talking about this because I think we create a misimpression that there is a difference between saying that the consequences of this reaction are small, and the -- in the EIS perspective, we're not going to worry about them because they have a low probability.

I think those are very, very different things, and I think as we go forward, I'll probably have some follow-up questions to see if we can figure out a better way to write this if we talked about it in our EIS because it really is not a small impact. I mean, obviously, you know, and everybody -- in the back of everybody's mind should be Fukushima. We're not talking about a small environmental impact from Fukushima. We're talking about a very, very large environmental impact -- at this point, I think unknown ocean impacts, certainly more well-known land contamination on land; so thus then to characterize, you know, our EIS is that the impacts are small, I think, creates some amount of confusion.

SCOTT FLANDERS: I appreciate the challenge, and I think it's a challenge that the staff has. And I think also at the time when we were establishing how we would addressed "severe accident" in NEPA documents, they talked about the need to -- well, yes, the consequences when severe accidents

certainly could be larger. There's no question about that. But then they also had to put that into context in the sense of how likely is it to happen? And it was -- it was determined that it was important to kind of express it in that -- in that context so that you had a balancing of, certainly, these could be very significant impacts but -- so the public also understands that -- details. They need to understand, you know, how likely such an event can happen. And so that's kind of the balance that we try to do with our NEPA document. So our decision on what the impact level is really based on that --

CHAIRMAN JACZKO: Right.

SCOTT FLANDERS: -- that risk --

CHAIRMAN JACZKO: Yeah.

SCOTT FLANDERS: -- if you will

CHAIRMAN JACZKO: And again, I mean, maybe you can appreciate how for some people that's confusing because they think of -- you know, I mean, we hear "moderate impacts" from traffic and a "severe accident" is a small -- you know, I mean, is this word -- you know, there's maybe some better ways that we can talk about it, and this is probably a generic issue and not really specific to this, but I'm taking too much time so -- Commissioner Svinicki.

COMMISSIONER SVINICKI: Thank you all for your presentations. I'll begin with a couple points of clarification from the applicants, if I may.

The first is just a general point. The proposed location, of course, for Units 2 and 3 is not a Greenfield site. You have Unit 1 already operating. In your preparation of the environmental report, can you describe in broad terms how much previous environmental studies or historic studies were relied upon? Or do you look afresh -- the data that you input to the

environmental report, could you characterize broadly how much you just tap into previous environmental reports related to Unit 1 versus really looking afresh and updating your data and inputs?

STEPHEN SUMMER: Let me answer that. Steve Summer, supervisor of Environmental Services. It's a combination. Most of the -- since we had -- and I was involved in the environmental monitoring when Unit 1 was being constructed and in its post-operation monitoring, we had that information available.

We also had the information from previous things like cooling water intake studies that are required under the EPA. Those kind of things help address aquatic issues, but when we started on this process, we did do a lot of new studies. We had -- backup for a second. When we went through license renewal, we did some cultural resource in -- for endangered species.

[unintelligible] endangered species, we were able fold that in an areas already been looked at. But we did do aquatic surveys, terrestrial surveys, cultural resource surveys of the a whole site, and then as the ER has expanded to include the actual locations of transmission corridors, we did those same kind of things along those corridors; so we used some of the existing information, but we also looked at most of the resource -- all resource areas again.

COMMISSIONER SVINICKI: In those instances where you relied upon data that you had available because of the existence in operation of Unit 1, would it be your testimony that you at least looked at whether or not that information was accurate in terms of existing circumstances today in all instances where you used existing data?

STEPHEN SUMMER: Yes. I feel comfortable with that.

COMMISSIONER SVINICKI: Okay. Thank you. And as second question for an applicant witness, as has been mentioned, the impacts of construction on transportation were found to be moderate. The applicant has committed to develop a construction management traffic plan with mitigating measures. When does the applicant expect to finalize the construction management traffic plan if it's not yet finalized? And do you expect to implement a combination of the measures that you set forth in your environmental report?

APRIL RICE: We'll address that. We are drafting the construction management plan. Prior to this point, we've done several traffic studies to kind of gather baseline data. That will be in place before the end of the year. We do plan to utilize the existing methods that we've described already and look at alternatives such as shuttle buses or things like that should the traffic get to be very difficult. But just to clarify it, it's really a shift change when the traffic problem exits. Other than that, the roads are fairly rural and there's not a lot of traffic. But certainly we have been working with SCDOT and continue to upgrade the roads in that area as we can.

COMMISSIONER SVINICKI: As you draft that plan, is it accurate to say that it's your expectation that it would put forth or set forth, essentially or in general, the same types of measures that you described in your environmental report?

APRIL RICE: Yes. And a number of those have been taken already.

COMMISSIONER SVINICKI: Okay, thank you. My other questions are for the staff. I had asked a similar question in the local mandatory hearing. It really is just to get into the record a better understanding of the types of

site audits and field activities that were undertaken by the staff as part of its review. Yesterday we had the benefit of seeing some of, in our photos of NRC staff in the field doing this work. So what I'm trying to understand is, just in broad outlines, the type site audits, field work that you did, and certainly to complement the paperwork and desktop reviews that you did. And I think the applicant mentioned in the presentation this morning at least one activity where they were a 75-member team. I don't, maybe that was just cumulatively over the course of the various field activities. But could one or more of you give some broad description into the record of the types of field activities you conducted or site audits?

PATRICIA VOKOUN: We had one site audit, and we also audited all the alternative sites. So that entailed going to the site, walking the site. We looked at comps. We met with other agencies and with the applicants while there.

RYAN WHITED: I would just add to that. We do a variety of things at these audits. Depending on the resource area, we'll have folks that look at input and output decks for some of the code modeling. There'll be discussions between our experts and the applicants' experts. Socioeconomics folks will go around to the community and interview key stakeholders. We do "boots on the ground," you know, walk-arounds to various parts of the site, depending on the resource area involved, the things that they need to see.

COMMISSIONER SVINICKI: Okay, very good. Is there anything else that anyone would like to add?

JACK CUSHING: Also like the cultural resource review. We actually go visit with the State Historic Preservation officers. And we also engage

other state and local officials during the site audits and invite them to our site audits.

COMMISSIONER SVINICKI: And does that engagement with these other officials sometimes result in additional activities that you undertake?

JACK CUSHING: Definitely with the State Historic Preservation officer. Because we do consultation under the National Historic Preservation Act. So we have an active engagement with them on exactly what they would like. And for the transmission lines are resulted in a management agreement between the core and the two utilities.

COMMISSIONER SVINICKI: Thank you. Anyone else?

PATRICIA VOKOUN: Yes. I would just add that the resource specialist would also be, we do tour the site and look at all of the where the intakes and discharges are going to be. Only usually their environmental staff would show us where all of their environmental monitoring activities are taking place and where their data has been collected. That's part of our verification activity. So, we always look at the metrological tower and where they've conducted the aquatic resource monitoring and terrestrial resource monitoring, cultural.

COMMISSIONER SVINICKI: Okay, great. Thank you. I think that much just helps me paint a better picture. We know that types of activities you undertake, and that's very helpful. Thank you, Mr. Chairman.

CHAIRMAN JACKO: Commissioner Apostolakis.

COMMISSIONER APOSTOLAKIS: I'd like to come back to an issue that's related to what the chairman raised earlier. In other context -- I mean as she pointed out, the decision before the commission is a yes, no decision. We

either approve or we disapprove. And that, of course, is the same with many other areas, like power uprates, design certification, and so on. And some people have complained that the Commission never says no. And it seems to me that there is a good reason for that. [unintelligible] it never says no. But in most cases it agrees with the staff's recommendation. The stakes are so high, economic stakes for the applicant. And there is such an elaborate review process that takes place, including the pre-application review before the issue comes before the Commission, that it seems to me that the probability that the thing will be approved is extraordinarily high. Otherwise, it would be foolish to come here when there is even a 10 percent chance that it may be rejected. So, the criticism that we never say no, it seems to me, ignores this part that by the time things get before us, there is a very high probability that whatever it is would be approved precisely because of this prolonged review and the willingness of the applicant to go over it with the staff and accommodate, perhaps, the staff's questions and requirements. Is that a reasonable way of thinking? Or am I missing something?

SCOTT FLANDERS: No, I think that's a reasonable interpretation of the process. Certainly, through a request for additional information, it's purpose starts with the guidelines that we lay out, in terms of what type of information and what the expectations are that need to be satisfied. So there's a good understanding of what's needed early on in the process. And then through that we also ask a great deal of requests for additional information to ensure that we have an adequate review. And then I would just add that there have been examples, some of which you talked about, is through this process, as we find ourselves getting close to making decisions but not

necessarily find our ways to support the proposal, applicants have modified their proposals. There's been examples in the past where that's occurred, where they actually go back and make a modification. I just think of an example in the, Amy and I go back to the early '70s when we were licensing plants with the South Oak Creek site. Originally the first proposed site was a site that we, the NRC staff, made clear that they were not aligned with. And later they decided to move it to the current location. So there's examples of that. So I think that's a reasonable interpretation.

COMMISSIONER APOSTOLAKIS: Hasn't been ever a case where a decision came before the Commission with a negative site recommendation? Does anybody know of any case? Was anybody foolish enough to come here?

[laughter]

BARRY ZALCMAN: My name is Barry Zalcman. I think you need to swear me in before I can testify.

CHAIRMAN JACZKO: Please state your name and raise your right hand.

BARRY ZALCMAN: Barry Saltzman.

CHAIRMAN JACZKO: Do you swear or affirm that the testament you will provide in this proceeding is the truth, the whole truth, and nothing but the truth?

BARRY ZALCMAN: Yes, I do.

CHAIRMAN JACZKO: Okay, you're sworn in.

BARRY ZALCMAN: A very interesting point. I think Mr. Flanders has indicated the perfection of an application occurs over time. And your expectation that this is to be a very mature application by the time it actually shows up at the Commission with a high expectation that the agency

would act favorably on it. But if you do go back a long time ago, there was a site called the Ravenswood site in Queens, New York, where the applicant, Consolidated Edison at the time, suggested that putting in a facility right at the load center would be a benefit in economic, in terms of producing safe and clean energy. And that actually was at the advisory committee, ACRS. They said, "What are you thinking?" And, in fact, the answer was no. You should not build in downtown Queens a nuclear power plant. So that has been a part of the history. The Burlington case, the Newbold Island, winding up being South Oak Creek. Other examples where during the course of the staff review, the interactions with the applicant resulted in perfecting the applications. So it's not that the agency doesn't say no. But sometimes it's a very long time before we get to yes.

COMMISSIONER APOSTOLAKIS: But in those cases, the decision or the issue never came before the Commission. It was stopped earlier.

BARRY ZALCMAN: Correct.

COMMISSIONER APOSTOLAKIS: Now again for the applicant. On slides 12 and 13, you're discussing view of alternatives. And you gave a brief description of tables with matrices at putting numbers from one to five. That's when you talk about it.

APRIL RICE: [inaudible] alternate sites, the one to five.

COMMISSIONER APOSTOLAKIS: There's energy alternatives and then alternate sites. You did it only for the sites?

APRIL RICE: For the alternate sites, correct.

COMMISSIONER APOSTOLAKIS: Not for the energy alternatives.

APRIL RICE: That's correct.

COMMISSIONER APOSTOLAKIS: And then concluded there was no obviously superior site to Summer. Could you give me a little more detail on all this process? I mean who, for example, when you rank something between one and five, who did that? You did that? Or you had outside people do it? And was there ever a discussion of whether it's a two or a four.

APRIL RICE: Yes, actually there was. We did have Tetra Tech do that analysis for us, the environmental services contractor. And we were reviewed in-house of the results of the initial scoring. For instance, Mr. Whorton, who was here yesterday, looked at the geotechnical scoring. Mr. Summer looked at the hydrological scoring. And we did have some back and forth on whether the score was two or four or one. But ultimately the scoring showed the VC Summer site to be higher in ranking than the other site, perhaps not by a whole lot in the case of Fairfield One, but by a substantial amount compared to others. The criteria are defined in an EPRI Siting Guide that we use. So the initial criteria came from the EPRI Siting Guide. And then there is judgment required, though, in determining the exact number --

COMMISSIONER APOSTOLAKIS: -- The issue here was, we will build a nuclear plant, and here is a number of sites where we can do it.

APRIL RICE: Correct.

COMMISSIONER APOSTOLAKIS: Whereas in slide, when you're dealing with the energy alternatives --

APRIL RICE: -- Correct.

COMMISSIONER APOSTOLAKIS: -- you may build something as was explained very clear. Why didn't you use a similar process there?

APRIL RICE: I'm not sure I can answer that question. We looked

generally at whether these alternatives would be preferable to a nuclear power plant. In the instance of purchase power or demand-side management, it would not provide baseload power. In the instances of wind and solar in South Carolina, you cannot really generate large amounts of baseload power from that. So you end up with coal and gas, which had the emissions cost. And so --

COMMISSIONER APOSTOLAKIS: -- So it was kind of easier to do that, you know, using your own judgments.

APRIL RICE: I think this is generally how they've been done before. We did look at other --

COMMISSIONER APOSTOLAKIS: -- Traditionally.

APRIL RICE: -- applications.

COMMISSIONER APOSTOLAKIS: Thank you, Mr. Chairman.

CHAIRMAN MAGWOOD: Commissioner Magwood.

COMMISSIONER MAGWOOD: Thank you. Good morning. I wanted to -- in this such short amount of time, I wanted to pick up on a question the chairman started earlier this morning about nature of the NRC EIS. I sort of had some of the same thoughts. And I wanted to follow up in a little bit. One of the things that occurred to me as I went through this, particular the evaluation of the energy alternatives, was that's certainly the way that NRC staff might view these alternatives. But I wonder what other agencies do with these alternatives, other agencies that have to go through EIS for power-related activities. DOE, I'm sure Interior has had to do them in the past. Have you ever looked at, broadly, what the federal government does in evaluating energy alternatives? Coal versus nuclear versus renewables. Is the government consistent in its analysis?

SCOTT FLANDERS: I think, in terms of going back and looking at what other agencies do in terms of evaluating energy alternatives. Certainly one of the resources that we use in terms of understanding some of the energy alternatives and their potential is the Energy Information Agency, information from DOE. And we certainly take that into account and factor that into our decision making. But it explicitly, I'm going back in and kind of comparing how they go through this alternative evaluation, and how they evaluate the environmental impacts associated with each. I, myself, I can't say that we have. But we can certainly follow up. Let us get back to you on that, to follow up on the more detailed questions, so we can check with other members of the staff to see if maybe there's some folks have actually looked at that.

COMMISSIONER MAGWOOD: Yeah, I'd be curious about that. Because it seems to me that, particularly right now, and I actually don't know for a fact that the DOE is doing EIS's course loan guarantee program. But I imagine there must be something like that. And if they want to build a large solar facility somewhere, for example, let's say I don't know, South Carolina, bad place for a solar point, by the way. And they ran through this analysis. And they compared building a large solar plant to a large coal plant or a nuclear plant, and then came up with the exact opposite type analysis, that would be very troubling. And I just wonder if there's something we can do to understand what others are saying. And not that we control what our agencies do. But it would be good, and I figure the public deserves, to have some sense of consistency from the government when these evaluations are made.

SCOTT FLANDERS: Yeah. We'll certainly get back to you on that. I think one of the, I would just add that while the conclusion may be different,

in terms of whether or not to proceed with a particular or different type of energy alternative, that could be driven by a number of factors, in terms of overall decision making part of the process. So it could be that while the technical aspects of describing what the impacts are from each of the opposed that technologies or alternative energy sources. Hopefully there's some similarity in terms of the basic facts of the impacts. But the decision could be different as a result of different considerations, in terms of what the proposed actions are.

COMMISSIONER MAGWOOD: I just recall that back when states were doing resource management plans for the first time back in the late '90s, there were some states that had nuclear dows [spelled phonetically] and ethnic costs for a whole lot of different reasons I won't go into now, but you can, there's analysis can go different ways depending what objective you're trying to get at the end of the day. And I wanted to have some comfort that the results of our analysis wasn't driven by the outcome, that it was driven by the process. So if there's a way of looking into it, I'd appreciate it.

JACK CUSHING: Along this line, in South Carolina they're a regulated utility. They go before the Public Service Commission. And in that process, the Public Service Commission looks at the different types of energy available to supply the needs of the people of South Carolina. And in that they look at different types of energy. And they weigh all the different -- you know, reliability, they don't want to be all one fuel source. They also look at the environmental impact. So that is a process. And we were informed by that when we were looking at the environmental impact statement for Summer site.

COMMISSIONER MAGWOOD: I appreciate that. More specific question. Severe accident mitigation analysis, the S.A.M. analysis. It was interesting that the analysis that we have in the environmental report goes through the usual physical possible design change that could be made as we go through this analysis. But it doesn't have the procedural modifications that one could look at. And the reason given for that was because we don't have a completed plant with established procedural controls yet. So therefore, that was left in advance. Question for the staff I have is that, and I appreciate the fact that we don't have those procedures yet, but how do we go forward? I mean, how does that comply with the regulations not to have that in place?

JACK CUSHING: Well in the EIS, they looked at -- they acknowledged that the procedures weren't in place. And what they did was a screening. They said if we took all the risk from the procedures out of the severe accidents, it would still not be cost beneficial. So that was how they dealt with it. And so they don't expect any procedural changes to have any effect. And I was a former operator. And I have a feeling that any procedures that they will develop will be ones that would deal with severe accident in the most efficient way.

COMMISSIONER MAGWOOD: No, I have feelings about it too. But where's the analysis? Don't we have to go through that formal step?

MALCOLM PATTERSON: I'm Malcolm Patterson. I'm a reliability and risk analyst in the Office of New Reactors. I'm in the Severe Accident and Probabilistic Risk Assessment branch. I actually think that was a very good answer. We quantify this to the extent that we look at how much good the operators' actions can do, what mitigation we expect from the actions that we

are confident will be in their severe accident mitigating guidelines.

COMMISSIONER MAGWOOD: I get it. I'm not challenging the technical intuition. I have a two minutes. I'll tell a quick story. When I was a young -- actually, I was never an engineer; I was a scientist -- working in industry, I went to a senior engineer with a problem, didn't know how to solve it. And he looked at it and said, "Put 50 there, 100 there, 15 there." And I asked him, "Well, how should I reference that?" He said, "Put engineering judgment." That was the answer. I don't think we can use engineering judgment. I just, it seems to me that one should have to go through the process of writing down what some procedures ought to be, and then showing that they don't make a big difference. And I think simply just saying that it's our engineering judgment that it'll be okay. How does the public review that?

MALCOM PATTERSON: I don't think that that method of engineering judgment is considered acceptable any longer. We do have to document --

[talking simultaneously]

MALE SPEAKER: [inaudible]

MALCOM PATTERSON: -- our assumptions. There are guidelines developed at the DC stage; so it's not that the expected actions are hypothetical. We have identified the kinds of strategies that the operators will have available to them, and so we know what benefits we expect implementation of those strategies to provide.

COMMISSIONER MAGWOOD: So will this ever get picked up and then in the analysis, whether it be a STAMA-type [spelled phonetically] analysis that'll reflect that -- or is it just --

MALCOM PATTERSON: It'll be evaluated after those procedures are in

place and that is [unintelligible].

COMMISSIONER MAGWOOD: Okay. So it's part of what process? Is it -- when will that happen?

[talking simultaneously]

MALCOM PATTERSON: After those procedures are developed.

COMMISSIONER MAGWOOD: And so that happens as part of what process? This is part of our normal regulatory --

MALCOM PATTERSON: The SEMG [spelled phonetically] implementation is done by the licensee after [inaudible] --

[talking simultaneously]

COMMISSIONER MAGWOOD: Okay. Okay. It's part of the SEMG implementation. Got it. All right. Thank you. Thank you.

MALE SPEAKER: [inaudible]

COMMISSIONER OSTENDORFF: Thank you, Mr. Chairman. Thank you all for your presentations today. I'll start off the applicant in the area of groundwater contamination. Can you talk -- can somebody address how you plan to minimize the groundwater contamination?

STEPHEN SUMMER: Generally, the site does not have a major aquifer. The water table tends to sit on top of the granite in that decomposed rock area with some water in the cracks in the granite; so water wells are low-producing in the area and also transmission of any contaminated floats [spelled phonetically] tend to take a long time to get to a person or -- the word's escaping me -- the receptors -- yes, thank you.

Evaluation looked at those float pathways off site. I'm -- I'm not able to speak about the actual design of the facility. I know we will have --

I expect we'll have groundwater wells put in place.

Right now, we put in groundwater wells before pre-construction activities and monitored those, but some of those had to go away with the pre-construction. There'll be new groundwater wells put in, and we can monitor that. As far as spills that may occur inside the plant, I'm not able to address that.

APRIL RICE: I guess I would add that Mr. Schmidt yesterday talked a little bit about the wastewater discharge line and the fact that we will meet the NEI guidance for providing groundwater monitoring wells, if that was your specific question.

COMMISSIONER OSTENDORFF: Well, I know that that was the one subset --

APRIL RICE: Right.

COMMISSIONER OSTENDORFF: -- that was discussed yesterday afternoon, but I just [inaudible] that was just one system though. It's not necessarily a comprehensive piece. I'd ask you to take that question for the record and provide a full response on that.

APRIL RICE: Well --

COMMISSIONER OSTENDORFF: I thank you. For the staff, let me ask you a question. Can you talk about you -- how the staff analyzed the water consumption analysis provided by the applicant? I mean, do an independent analysis, a confirmatory analysis -- just in -- at a high level. I'm just curious.

JACK CUSHING: Staff used the CORMIX model, and we didn't bring our hydrologist with us; so I'm not exactly sure if it was independent or

confirmatory analysis. I could check with the EIS [inaudible] --

[talking simultaneously]

COMMISSIONER OSTENDORFF: I'd ask you to tape that for the record as well --

JACK CUSHING: Yes.

COMMISSIONER OSTENDORFF: -- get some background on how that was -- the staff looked at that, in particular as to how the staff looked at future projected water use.

JACK CUSHING: Yeah. You mean by other users or [inaudible] we do a cumulative analysis in chapter seven for water use. And what we do in that area is we look at -- we identify an area of potential interest. In this case, it was the Broad River drainage basin.

COMMISSIONER OSTENDORFF: [affirmative]

JACK CUSHING: And then we go to the NEPA database and -- for water permits -- and we looked at the water users [spelled phonetically], and we primarily focus on how the water uses [spelled phonetically].

We did include in our analysis the lead facility that's potentially come on line. We consider that as part of -- because that will also take water from the Broad River drainage basis. So we do project out reasonably foreseeable future activities on the hydro [unintelligible] surface water use.

MALE SPEAKER: [inaudible]

[talking simultaneously]

NANCY KOHN: Could I -- can I answer that? The hydrologist did do an independent review of reliability of future water supply. I can give you the -- go into the detail of it [inaudible] --

[talking simultaneously]

COMMISSIONER OSTENDORFF: But [it wasn't] [spelled phonetically] independent as opposed to confirmatory review?

NANCY KOHN: Yes.

COMMISSIONER OSTENDORFF: Okay.

NANCY KOHN: Yes. And that would -- that is in our -- in chapter five of the EIS under water use, and I can also address how the staff looks at the -- you know -- or water use on the routine operation basis. The water lost in evaporation was about 21 CFS, and we looked at that in the context of the flow regime of the Broad River; and it's about one percent of the mean annual flow of the river?

COMMISSIONER OSTENDORFF: Okay. Thank you. Nancy, I want you to stay [spelled phonetically] for you one last question here. With your position for Pacific Northwest National Laboratory, I assume you have a chance to see how other agencies approach environmental issues -- do you? If you don't [inaudible] --

[talking simultaneously]

NANCY KOHN: [inaudible] not enough to answer right here.

COMMISSIONER OSTENDORFF: [unintelligible] you know, all I -- the question other colleagues have kind of asked, you know [unintelligible] up that, you know, how do other kind of consistencies do we have as a federal government between the Department and Energy, EPA, NRC, Corp of Engineers, et cetera, and I didn't know if there's anything that came to your attention from where your home organization is that would highlight any significant differences as to how the NRC is approaching the NEPA review compared to how

other agencies might approach the similar issues.

NANCY KOHN: I have not been involved in other NEPA reviews for other agencies. You'll hear a little bit later from Ryan about how the Corp looks at alternatives but --

COMMISSIONER OSTENDORFF: That's okay.

NANCY KOHN: -- I can't answer.

COMMISSIONER OSTENDORFF: All right. Thank you. Thank you, Mr. Chairman.

CHAIRMAN JACZKO: Well, thank you for your presentations. We'll take a five-minute break.

(Whereupon, a short recess was taken)

CHAIRMAN JACZKO: All right. We'll go and get restarted with our last panel on the environmental review, and that will discuss the environmental justice review and then the staff's interactions with the U.S. Corp of Engineers in producing the Environmental Impact Statement. Again, would the witnesses please state their name and position for the record [inaudible] --

APRIL RICE: April Rice, licensing supervisor, NC [spelled phonetically] Summer units two and three.

STEPHEN SUMMER: Stephen Summers, supervisor, Environmental Services, SCANA Services.

LISA MATIS: Lisa Matis, Tetra Tech, deputy project manager for the environmental report.

SCOTT FLANDERS: Scott Flanders, director of the division and site -- division of site and environmental reviews.

RYAN WHITED: I'm Ryan Whited, chief of environmental projects,

branch two, Office of New Reactors.

PATRICIA VOKOUN: Pat Vokoun, project manager for the environmental review.

DANIEL MUSSATTI: Daniel Mussatti, economist with the environmental technical support branch

DAVID ANDERSON: Dave Anderson, senior economist, Pacific Northwest National Laboratory.

CHAIRMAN JACZKO: [Unintelligible] applicant.

PATRICIA VOKOUN: Next slide, please. Next [unintelligible] thank you.

As requested, this panel will address the environmental justice analysis and the applicant's perspective on the U.S. Army Corp and Memorandum of Understanding. Ms. Matis will cover the topic of environmental justice.

Next slide.

LISA MATIS: By way of instruction, I'd just like to say that "environmental justice" is to find the fair treatment and meaningful involvement of all people, regardless of race, color, national origin or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies; the concern that minority or low-income populations might be bearing a disproportionate share of adverse health and environmental impact by then President Clinton in 1994 to issue Executive Order 12898 to address these issues.

In 1997 the Council on Environmental Quality provided guidance for implementing environmental justice into the National Environmental Policy Act or NEPA processes [spelled phonetically].

The NRC has issued its own guidance [spelled phonetically] from the environmental justice analysis, modeled on the [unintelligible] guidance; for example, the Office of Nuclear Reactor Regulations, instruction LIC-203 or specifically Appendix C of that document. All of these guidance documents were considered in the environmental justice analysis for the VC Summer units two and three environmental report.

Next slide, please.

The practice used to evaluate environmental justice for the VC Summer site is summarized in Section 2.5.4 of the environmental report. Potential impacts for construction and operation of units two and three are described in sections 443 and 5.8.3, respectively. The environmental justice impacts analysis for each of the alternative sites is addressed in Section 9.3.

The evaluation began by contacting local government officials and the staff of social welfare agencies, concerning any unusual resource dependencies or practices such as subsistence living that could result in potentially disproportionate impacts to minority or low-income populations.

Interviews were conducted with organizations including United Way in the Midlands; [unintelligible] Public Service, South Carolina Department of Health and Environmental Controls, home health services, the Department of Natural Resources, Newberry County Memorial Hospital and Newberry County Department of Social Services.

Because of the rural nature of the area in which the Summer site is located, most public agencies cover more than one county. The interviews identified no unusual resource dependencies or practices such as subsistence living through which populations could be disproportionately impacted by

construction or operation of the new nuclear reactors.

Agency representatives contacted during the development of the environmental report stated that most low income individuals relied on government or community-aid programs than on fishing, hunting or gardening. Most agency representatives reported that activities such as hunting, fishing and gardening were done for recreational purposes rather than for subsistence living.

A representative from the Department of Natural Resources did mention that occasionally Vietnamese individuals were observed collecting Corbicula [unintelligible] Asiatic clams from the Monticello Reservoir. The census data identified only one block group having a significant Asian population, and that's located in Richland County which is some distance from the site.

Because Corbicula harvest for possible human consumption had been observed, the analysis of samples of Corbicula from Monticello Reservoir was incorporated in the VC Summer radiological environmental monitoring program. Samples have been collected and analyzed for gamma-emitting isotopes; and to date, no detectable radioactivity background has been detected.

Fishing does take place recreationally in Monticello Reservoir or Parr Reservoir in the Broad River. The Department of Health and Environmental Control monitors water bodies in the state and posts fish advisories as appropriate. There are no advisories exist or have historically for Monticello Reservoir or Parr Reservoir or the Broad River.

With respect to migrant workers, agencies' representatives stated that there was not a large migrant worker population; and the population that

does exist was not expected to engage in subsistence living.

Next slide, please.

We applied the NRC methodology for identifying potential environmental justice areas through a demographic search of the 50-mile region, conducted at the census block group level. The methodologies are described in NUREG 1555 and in LIC-203, appendix C.

Geographic Information System or GIS software in the U.S. Census Bureau 2000 census data were used to determine minority and low-income characteristics by block group within 50 miles from the VC Summer site. The block group was included in any part of an area it fell on the 50-mile region. The 50-mile radius includes 803 block groups in both South Carolina and North Carolina.

The census block groups were evaluated independently, depending on the state in which they were located. For example, if the block group minority percentage exceeded 50 percent or the block group percentage exceeded the corresponding state percentage by more than 20 percent, the block group was identified as having minority population. 234 block groups had significant aggregate minority populations. This included much of Fairfield County.

A block group was considered low income if its low income population exceeded 50 percent or the percentage of households below the poverty level exceeded the corresponding state percentage by more than 20 percent. 45 block groups had significant percentages of low income households. None of these fell in the vicinity of the VC Summer site.

Next slide, please.

Looking at the construction impacts. As described in panel one,

most adverse construction impacts were small and temporary. The environmental report concluded that the construction traffic could have a moderate to large impact on the two-lane highways in Fairfield and Newberry County, particularly South Carolina 213 and 215.

As previously discussed, mitigation measures are being taken to address the construction traffic impacts. No constructional-related disproportionately high or adverse health or environmental effects to low-income or minority populations were identified.

When considering the expected impact and the likely exposure pathways, the environmental report concluded the environmental justice impact would be small and warrant no additional mitigation. In the final EIS, the NRC staff noted a moderate construction traffic impact.

NRC guidance regarding environmental justice indicates that if there are significant impacts to minority or low-income population, the reviewer shall look at mitigating measures and benefits. To the extent practicable, the mitigative measure should reflect the needs and preferences of the affected minority or low-income populations.

SCE&G has formed a community coalition with members of the public from the communities in close proximity to the site. That outreach effort included identifying heavy truck traffic on certain local roadways as an area of concern. SCE&G has been able to redirect the truck deliveries to mitigate some of the traffic and noise concerns.

Next slide, please.

Turning to operations. The evaluation of environmental justice impacts from operations was conducted in a similar fashion. Described in the

earlier panel, most adverse impacts from operation of units 2 and 3 were small. No operations-related disproportionately high or adverse health or environmental impacts, impacting minority or low-income population health and welfare were identified. The environmental justice impacts for the operation of units two and three were found to be small and additional mitigation not warranted.

Next slide, please.

The environmental justice evaluations for the alternative sites follow the same process to identify minority populations or low-income populations in the region within a 50-mile radius of each alternative site.

For the first three sites listed, Savannah River, Cope and Saluda, the 50-mile radius fell within the states of South Carolina and Georgia. For the Fairfield one site, the 50-mile radius included South Carolina and North Carolina.

The impact analysis for each alternative site considered the possible health and environmental effects and the likely exposure pathways. The environmental report concluded the environmental justice impacts from the construction and operation of the proposed project at each of the alternative sites would be small, and additional mitigation would not be warranted.

That concludes the environmental justice discussion. Mr. Summer will now address the Memorandum of Understanding with the Army Corps of Engineers.

STEPHEN SUMMER: Next slide, please.

The Memorandum of Understanding between the Nuclear Regulatory Commission and the United States Army Corps of Engineers was signed in

September 2008 and established a framework for coordination and participation in the review of nuclear power plant applications.

Next slide.

The Memorandum of Understanding primarily affected the NRC and U.S. Army Corps of Engineering staffs. From the applicant's perspective, the staffs and the two agencies work well together and produce to complete timely and thorough final environmental impact statement.

The U.S. Army Corps of Engineers participated in public meetings, developed requests for additional information with the NRC staff and made visits to the site to verify jurisdictional determinations.

The NEPA scope for the two agencies is slightly different as the proposed action is different for the two agencies. Since most of the impact is to waters of the United States, primarily wetland impacts for this project occur outside of the Summer Station units two and three project boundary. Their transmission rights [unintelligible] pass. The U.S. Army Corps of Engineers had a greater focus in these areas. This concludes our presentation.

CHAIRMAN JACZKO: Thank you. We'll now hear our presentation from the staff.

RYAN WHITED: Good morning. My name is Ryan Whited, and I am the chief of environmental projects, branch two, in the Office of New Reactors.

With me today is Scott Flanders, director of the division of site and environmental reviews in the Office of New Reactors;

Patricia Vokoun, the project manager for the VC Summer review;

Daniel Mussatti, economist in the division of site and environmental reviews; and Dave Anderson, senior economist at Pacific Northwest

National Laboratory.

This presentation will discuss the two novel issues highlighted in the staff's SECY paper that was provided to the Commission in advance of this hearing.

The first issue is implementation of the updated Memorandum of Understanding, or MOU, with the U.S. Army Corps of Engineers; while the second issue is the staff's environmental justice review for the VC Summer COL application.

I'll begin with the discussion of the MOU, and Dan and Dave will follow with the presentation on the staff's environmental justice review.

Next slide, please.

On September 12, 2008, the NRC and the Corps signed an updated MOU for the review of nuclear power plant applications. The NRC and the Corps began negotiating the updated MOU when it became clear that many new reactor applicants would need a Corps permit to undertake pre-construction and construction activities.

The MOU establishes a framework for early coordination and participation of both agencies to ensure the timely review of applications so that each agency's review responsibilities under the National Environmental Policy Act and other related statutes can be met in a manner that is effective for the federal government.

The MOU anticipates that the NRC would usually serve as the lead agency as it did for the VC Summer review and that the Corps will act as a cooperating agency. The overall goal of the MOU is to develop a single EIS that supports both the NRC's licensing process and the Corps' permitting

process.

Next slide, please.

Practices for performing environmental reviews differs somewhat between the NRC and the Corps. For example, the NRC staff evaluates environmental impacts in the EIS by using the impact category levels of small, moderate or large; and alternatives to the proposed action are compared to determine whether there are environmentally preferable alternatives and, if so, whether they are obviously superior.

The Corps administers a regulatory program to protect the nation's aquatic resources, including wetlands under Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act.

Applicants for a Corps permit must demonstrate that they have taken all appropriate and practicable steps to first avoid, then minimize and, finally, to mitigate unavoidable impacts to aquatic resources. In making permit decisions, the Corps must determine that the proposed action is the least environmentally damaging practicable alternative, or LEDPA.

In addition, the Corps conducts a public interest review as part of the permit decision-making process. In performing this review, the Corps considers numerous factors such as fish and wildlife values; historic, cultural, scenic and recreational values; flood plains and flood hazards; and energy conservation and development.

Evaluation of the probable impacts that proposed activity may have on the public interest requires a careful weighing of these and other factors. The decision by the Corps to authorize a project is determined by the outcome of this general balancing process.

Finally, while the Commission has limited the definition of construction in Section 50.10 and 51.4, to those activities that fall within its regulatory authority, the Corps does not make this distinction.

Pre-construction activities such as clearing and grading, erecting support buildings and building transmission lines are typically within the scope of the Corps permitting action when there is a potential impact to aquatic resources. This difference affected how each agency defined the VC Summer project and how pre-construction impacts were described in the EIS.

Next slide, please.

In preparing the EIS, the information needs of the NRC and Corps differed at times due to differences in the two agencies' regulatory frameworks and differences in the proposed actions for each agency.

The NRC's proposed action is the issuance of combined licenses, while the Corps proposed action is the issuance of a Department of the Army individual permit. The differing information needs of each agency required close coordination between the NRC and Corps staffs to ensure that all issues were adequately addressed in the EIS.

The Corps staff was integrated into the environmental project team at an early stage and remained engaged throughout the EIS development. The Corps staff participated in audits and developed requests for additional information for issues that were unique to the Corps.

Corps staff participated in writing sessions with the NRC staff to develop the EIS and were involved in public meetings on the draft EIS and consideration of public comments and the preparation of the final EIS.

The two agencies jointly consulted with other agencies, including

the Fish and Wildlife Service, National Marine Fisheries Service and the South Carolina State Historic Preservation Office which helped promote alignment among the consulting parties and reduced duplication of effort.

Accomplishing the goal of having one EIS that meant both NRC and Corps needs required certain adjustments to what the staff typically provides in EIS. In general, these modifications involve providing additional content for areas relating to the Corps proposed regulatory action. Examples of these adjustments are provided on the next slide.

Next slide, please.

Due to the Corps regulatory focus on protection of waters of the U.S., a more detailed and quantitative evaluation of wetland and stream impacts at both the proposed and alternative sites was performed.

The Corps issued requests for additional information to obtain the total linear feet of streams, the total acreage of wetlands, number of stream crossings and acreage of open water that would be impacted by the project at both the proposed and alternative sites. This required the applicant to provide and alternative sites.

This required the applicant to provide construction footprints at the alternative sites to determine impacts to water and wetlands as a supplement to the reconnaissance level information provided in the COL application.

While the building of transmission lines is not part of the NRC's action, because NRC's regulations specifically exclude such activities from the definition of construction, the Corps considers construction of transmission lines to be part of its proposed action if wetlands or waters of the U.S. are

affected as is the case for the VC Summer review.

Consequently, the environmental review team requested more data regarding transmission lines than the staff would ordinarily request for an NRC EIS. For instance, more detailed plans from the applicant regarding transmission line routing and impact assessments for potentially affected species along transmission line rights of ways were provided for both the proposed and alternative sites.

Finally, content was added to the EIS to describe the Corps' regulatory framework and role in developing the EIS. For example, information regarding the Corps' role as a cooperating agency and a description of the permitting process is included in chapter one of the EIS, while a description of the public interest review factors is provided in Appendix I.

Statements regarding the Corps' regulatory authority and process are provided in the introductions to other chapters such as chapters four and nine.

Next slide, please.

The VC Summer environmental review was one of the first projects to implement the revised MOU between the NRC and the Corps. The environmental review team achieved the objectives of the MOU in terms of timeliness, effective use of resources and the development of a single EIS to meet both the NRC and Corps' needs. In cooperating with the EIS, the team conserved federal resources and developed mutually beneficial working relationships that drew upon each agency’s respective expertise.

The technical analyses supporting the EIS, particularly those regarding water and wetland impacts, benefited from this close cooperation.

The Corps final permit decision will rely to a large extent on the information in the final EIS and will be made in its record of decision which will include the length of the determination, public interest review and any required mitigation measures.

As noted in the staff's response to one of the Commission's pre-hearing questions, the Corps has indicated that it will likely make its permit decisions 30 to 60 days after the applicant obtains its Clean Water Act's Section 401 Water Quality Certification from the South Carolina Department of Health and Environmental Control.

I'll now turn the presentation over to Mr. Dan Mussati and Mr. Dave Anderson to discuss the staff's environmental justice review.

DAVID ANDERSON: Name is Dave Anderson. I'm a senior economist of Pacific Northwest National Laboratory. I've been a subject matter expert in the areas of socioeconomics and environmental justice for the NRC since 1995. I've conducted the technical aspects of the staff's environmental review of the proposed action in the areas of socioeconomics, environmental justice, land use and benefit costs.

DANIEL MUSSATTI: Name is Daniel Mussati, and I'm the lead socio-economist for DSER's [spelled phonetically] environmental technical support branch. I have been an environmental economist with the federal government for more than 20 years, 15 of which were with the Environmental Protection Agency.

I oversaw the research and development of the staff's draft and final environmental impact statements for the VC Summer COLs, including socioeconomic; environmental justice; need for power; and benefit cost

assessments.

Next slide, please.

The assessment of environmental justice impacts -- the NRC has a robust and comprehensive process. The Commission's 2004 policy statement on the treatment of environmental justice matters addresses NRC's implementation of Executive Order 12898 and informs the staff's analysis of impacts on minority and low-income populations as part of the agencies' NEPA obligations.

The staff's environmental justice review follows the guidance in the relevant sections of NUREG-1555, the environmental standard review plan, which was based on CEQ guidance and incorporated environmental justice into the NEPA review.

The environmental standard review plan is periodically updated in consideration of changes in technologies, infrastructure and administrative processes and other conditions. That's why you see two dates in our references as well as the staff memo.

Next slide, please.

In accordance with our guidance, the staff establishes a circle with a 50-mile radius centered on the COL site as the outer boundary for detectable impacts. The staff uses census summary data and population estimates to identify areas within the 50-mile circle for minority individuals or low-income households maybe disproportionately affected by the agencies' issuance of the COL.

The staff's methodology is described in detail in Section 2.5.4 of the FEIS; in NUREG-1555, chapters 2.5.4, 4.4.3 and 5.8.3; in LIC-203, Appendix C; and in the staff's response to the Commission's pre-hearing question No. 16.

Areas that are identified by the census search are considered to be populations of interest. Identifying populations of interest through the census-based search does not necessarily mean that there is an environmental justice problem.

Conversely, the lack of identified census-based populations of interest does not mean that there are no environmental justice considerations to be addressed. To make that determination, the staff supplements the census-based information with their own investigation of the region.

This involves visiting local communities to observe general socioeconomic conditions, visits with public officials, visits with other community leaders, including minority leaders, church officials and the managers of local philanthropic and charitable organizations.

From these reviews, the staff verifies and supplements the census results. This boots on the ground process, also provides great insight into the pathways by which environmental impacts are transmitted to minority and low-income populations so that the staff can determine whether or not they will be subjected to adverse and disproportionate impacts in particular resource areas.

Before yielding the floor to my partner, Dave Anderson, let me summarize by stating that the NRC's environmental justice process is robust and comprehensive and as Dave will explain in his presentation, it also works.

DAVID ANDERSON: Next slide, please.

This map illustrates the census blockers that exceed minority population thresholds in the vicinity of the Summer site. We see that most of Fairfield County, the host county, makes up a population of interest. This

fact caused the staff to perform deeper reconnaissance of the local area to search for attributes that might affect the environmental review such as distinctive characteristics or practices.

Analysis of the census data did not identify block groups meeting or exceeding low-income thresholds in a close proximity to the site. The census analysis and the applicant's environmental report set the stage for the types of questions we asked in stakeholder interviews.

Next slide, please.

The staff visited the region of the summer site several times between 2007 and 2009. This local reconnaissance included driving affected roadways, meeting with local stakeholders, visiting river and lake recreation sites used by the local communities and visiting the cities and towns in the region.

Information from local interviewing and on the ground reconnaissance of the area surrounding the Summer site confirmed the following characteristics: The population is almost exclusively African-American. The interviews confirmed the existence of significant poverty not revealed in the census data. Community and religious leaders confirmed that fishing for subsistence or for cultural reasons is understood to occur.

The staff observed what we believed to be subsistence fishing in confirmed locations reported to be used for subsistence fishing. [unintelligible] some backyard gardens for subsistence also was reported in local interviewing. Interviews also suggested that subsistence practices were fading with the aging population and that the rising generation does not embrace these practices as fully.

Community leaders and government officials confirm that a lack of scheduled transportation in the western regions of the county prevents many local residents from finding and maintaining employment. Many residents walk as a primary form of transportation.

Next slide, please.

This slide illustrates two locations visited by the staff on more than one occasion where the staff observed fishing that could be characterized as subsistence fishing. An experienced observer can distinguish subsistence fishing from typical recreational fishing based on several characteristics observed in the field: A person -- a person bank fishing alone without visible means of transportation nearby; fishing at all times of the day; buckets or other gear indicating that fish are being kept rather than released; and all of this in a community where the practice has been reported to occur.

Next slide, please.

In addition to the officials we interview as part of a typical socioeconomics review, the staff also arranged interviews with local religious leaders, local political representatives and local charitable assistance providing agencies.

Senior management accompanied the staff on these to reviews to determine how best to facilitate the affected local communities participation in the scoping process. In addition to traditional scoping activities, additional customized scoping was arranged in the town of Jenkinsville.

Commenters were able to have their comments personally transcribed by staff rather than having to speak into a microphone or use Internet comment forms.

In the community open house format, staff made themselves accessible to the residents in attendance in a small group format designed to highlight the various issues that might concern local residents. Local residents conducted a survey regarding the proposed action, and the responses were added to the record as comments.

Next slide, please.

The staff determined that during peak construction -- during the peak construction employment period, traffic to the site would not exceed daily road capacity standards established by the state of South Carolina; however, the peak-hour traffic levels would exceed current state standards and construction worker traffic would result in a 50 percent increase in average daily traffic along Highway 213 and a 125 percent increase in average daily traffic along Highway 215. Therefore, the staff concluded there could be traffic-related disproportionately high and adverse impacts on minority and low-income populations in the Jenkinsville area.

However, the staff found that, because the traffic-related impacts would be temporary and of short duration and because they would be mitigated to some extent by the applicant's commitments, including the development of a traffic management plan, the impacts would be noticeable but not destabilize it.

Staff concluded that the environmental justice impacts to traffic during the building of the facility would be moderate. The staff concluded that all other environmental justice impacts during the building and operating of the facility would be small. The following slides provide some additional detail.

Next slide, please.

This slide provides some geographic context to the transportation impacts discussed. It is important to point out that Jenkinsville is not just the dot on this map but a linear community straddling Highway 215, the north-south route shown below the dot to extending off the top of the map.

The state traffic data is measured at the intersection of U.S. 176 on State 213, shown on the left side of the slide, where the state standard is a daily capacity of 8,600 vehicles.

It is also measured at the intersection of State 215 and State 213, circle just above the Jenkinsville dot, where the state standard is a daily capacity of 10,800 vehicles. Imagery from October of 2010 illustrates how the site entry intersects with Highway 213.

Next slide, please.

The staff considered several mitigative [spelled phonetically] factors in its analysis of environmental justice impacts from traffic. Traffic impacts would be temporary, lasting three to four years during which both unit two and three would be near maximum construction employment simultaneously -- planned mitigation of traffic impacts by the applicant, including strategic shift scheduling, use of shuttle bus and other measures identified in the traffic management plan.

Next slide, please.

In summary, the census analysis showed the immediate vicinity of the site holds a population of interest from the environmental justice perspective. Therefore, the staff performed more in-depth analysis than typical practice to more fully characterize this population, including local

interviewing of stakeholders and on the ground reconnaissance of the region.

This process led to development of customized scoping activities designed to engage the local communicate more fully, in addition to traditional scoping activities. The staff's analysis concluded that moderate traffic impacts would occur during peak construction employment, a three- to four-year period.

Because the characteristics of the local community, including their proximity to the expected traffic impacts, the staff determined the traffic impacts would be disproportionate and adverse for the Jenkinsville community. Therefore, a moderate environmental justice impact would be expected. The moderate impact determination was based in part on applicant commitments to mitigate the traffic impacts.

That concludes our presentation, and we look forward to your questions.

CHAIRMAN JACZKO: Thank you. [unintelligible] well, thank you for the presentation. I had a few questions. First, I was intrigued by the comment that -- I heard other comments about -- that some of the challenges of our environmental justice -- information gathering; and you indicated that there were, I believe, several low-income populations that weren't necessarily identified by the census.

Do we have a specific methodology that we use to try and identify those populations or is it more of an ad hoc process -- if we find them, we find them; if we don't --

DAVID ANDERSON: Well, the process is fairly consistent in that we -- it's organic as it goes. That's the consistent part of it. You

know, as we -- as we get a lead on information from talking to one stakeholder, we will try to confirm that with another stakeholder; and that process of interaction with various stakeholders lets us triangulate onto a reasonable conclusion. If enough people are telling us the same story, then we're likely to believe it.

CHAIRMAN JACZKO: So what are those primary sources of information then as you -- as you go to a community?

DAVID ANDERSON: Well, we start typically with local agencies -- as I stated, aid-providing agencies, local economic development folks, political representatives. In this case, we also talked to several different clergy and local county councilmen that represent the area covered by the site which kind of helped inform the review to the point that we got.

CHAIRMAN JACZKO: Okay. Thanks. The -- one of the issues that came out from the -- some of the audits -- and I believe that's part of the environmental justice reviews -- were concerns expressed about increases in crime and drugs during the unit one construction. And I'm not sure if that came out of regular scoping or specifically under the environmental justice review, but do we have any insights or expectations? Did we get any feedback about what expectations there might be for units two and three?

DAVID ANDERSON: Yeah. In our local interviewing, several of the stakeholders indicated -- and we had information from -- you know, there is a case where we had information from one stakeholder that suggested that there were crime issues and violence issues with the unit one construction so --

CHAIRMAN JACZKO: And I presume that's with the temporary construction workers --

DAVID ANDERSON: Yes.

CHAIRMAN JACZKO: -- that is coming to the --

[talking simultaneously]

DAVID ANDERSON: Yes. The construction workforce coming to the site and the practices that were in place at the time. In fact, perhaps the applicant might be able to shed some light on the unit one construction experience; but through our talking with local law enforcement and so forth in Fairfield County, that information was confirmed and then -- but they suggested now that practices have changed such in hiring that they wouldn't expect the same -- there's better betting of employees, and they would not expect the same kind of element to be hired and work on the construction.

CHAIRMAN JACZKO: [inaudible] if you wanted to add anything.

PATRICIA VOKOUN: I was not there at the time, but I believe Mr. Torres would like to speak.

Allan Torres: Allan Torres. I'm the general manager of construction for the site. I was present during unit one construction. I was part of the construction oversight, CNG [spelled phonetically], during that time period. There's a significant difference between the day -- the way we did business in early '70s in construction space. I'll give you -- starting with examples of Fitness For Duty bidding that we do currently for on-site work activities once you're in a post [unintelligible] stage.

Also preemployment activities have changed significantly in our industry from a -- from even from a construction side. You do -- you do the criminal background investigations. You do -- you do preemployment drug screening. Also all vehicles on site are subject to search, random search in

addition to the requirements for behavioral observation that take place by the supervision and staff; so it is a significantly different type of environment than it was in the early '70s.

CHAIRMAN JACZKO: Thank you. The last issue I want to touch on -- it slightly came up in the context of the MOU with the Corps, but it is -- and I don't know if have -- I don't know if we can put up a slide. It was probably one of the very first slides from the applicant's very first presentation but -- if you can get that so the folks can hear me. But it would be probably slide six from their very first presentation or -- six, seven, eight, any of those.

There's obviously a significant amount of activity going on at the site, and with the redefinition of construction -- thank you. Actually [unintelligible] one and two more. One more, maybe. I think it might -- thank you.

There is obviously a significant amount of activity going on at the site, and the Army Corps does not [spelled phonetically] have a pre-construction definition that we have -- personally may or may not -- no, I don't believe that that was a very good thing for us to do, and I didn't agree with that rule change; but maybe you can give me some thoughts on how we are capturing, and we've done a better job in the Summer EIS versus the Vogtle EIS which is also a little bit different because they had a construction [inaudible]. They had an actual LWA permit for construction activity, pre-license construction activity. I [unintelligible] call it that.

And how -- maybe you can talk about how we're properly capturing these impacts prior to the EIS being completed and, obviously, [unintelligible]

any licensing action for the site.

RYAN WHITED: Can I -- do you mean how we're capturing the impacts in the EIS?

CHAIRMAN JACZKO: Yes. How we're -- yeah. How we're capturing the impacts in the -- I mean, I think we're doing it as a cumulative effect or --

RYAN WHITED: Well, that's -- one of the key structural changes because of the Corps is cooperating is how we structure chapter four --

CHAIRMAN JACZKO: [affirmative]

RYAN WHITED: -- and in chapter four, we decided we need to structure -- to meet both or needs and the Corps' needs. Our needs would only be to describe the NRC increment, not pre-construction; but because the Corps doesn't make that distinction, we actually describe the impacts of both pre-construction and construction together and then we break out the NRC increment as well. So I think we would feel that we fully captured pre-construction impacts in chapter four.

CHAIRMAN JACZKO: So what if we don't have a Corps -- I don't know. Maybe there's no such -- there's not going to have some involvement of the Corps, but what if the Corps isn't there? What are we doing in that case then?

SCOTT FLANDERS: In those cases, chapter four would be as Ryan described where it would be focused on the NRC increment. So those activities that we consider a part of our regulatory action. And then those peak construction activities will be captured as they were also in the Summer EIS, also in chapter seven under cumulative impacts, where we categorize those as either past or present-type actions that need to be factored into the overall impact or stress on the environment. So that's how we would capture it, and

that's consistent with the overarching thought when they went through that rule -- the change [inaudible].

CHAIRMAN JACZKO: Well, as I said, I think when you look at these pictures, it is somewhat stark -- the activities and, you know, to some extent, a lot of the on-site immediate kind of environmental impacts happen well before we have any real involvement in the activity; and it's probably not a question here. It's just my continued belief [spelled phonetically] that there are challenges with this approach. But I appreciate your answers. Commissioner Svinicki?

COMMISSIONER SVINICKI: Thank you all for your presentations. I think all of my questions are directed towards the NRC staff. You described in your presentation this tailored approach to scoping. I think you talked about measures and certainly in the record you've discussed measures such as recorded interviews or transcribed statements so that individuals who weren't comfortable speaking in a public meeting would have the opportunity to provide input and not be subjected to circumstances that would make them less likely to participate in the process.

Have we received any sort of overall feedback about that -- the success of the way you went about this tailored approach to scoping, just generally? I think a lot of these strategies intuitively make sense, but do we have an overall assessment of how effective we think these tailored approaches were, and would we use them in the future?

SCOTT FLANDERS: Well, we don't necessarily -- at least I can't recall any specific written feedback on those approaches. We did receive comments at the time that we did it from a number of members who participated,

if they felt that it was useful and valuable and gave them an opportunity to better understand the action itself as well as to give them an opportunity to provide comments.

And also from our perspective, we thought it was valuable in terms of assuring that we had the opportunity and [unintelligible] one of the key pieces of scoping is to gather information. So it's information that the local community may have that we don't necessarily know about that would be important in the analysis.

And that was an opportunity also for us to get that information by broadening the scope of people that would actually participate in the process. So that's some of the things that we had, and we would use it in the future if we felt as though it was useful.

And again, like we did in this situation, it was dependent upon the particular location in the community. We actually went and spoke with the mayor of Jenkinsville, local [unintelligible] leaders, others, to get some sense of, "Okay. We want to do more. We want to reach out more to ensure that we received information from the local communities so that they understand the proposed action as well, how best to do that."

And the way in which we structured it was very much part-based on the feedback that we received in those interactions [unintelligible].

COMMISSIONER SVINICKI: So in the future, are you indicating that you would approach those same types of officials and you would solicit that same kind of feedback on tailored approaches and strategies; and if you received a positive answer, it's likely that you would use this in the future?

SCOTT FLANDERS: To the extent that we thought that was the best

method to go about doing the scoping and ensure that we reached at the community and try to get that broad perspective. So it's a balancing, but we certainly would not hesitate to use it if we thought it was necessary as we did in this case.

COMMISSIONER SVINICKI: Okay. Thank you. Turning to the topic of subsistence fishing -- I think was discussed in the presentation quite a bit. Subsistence farming was also talked about in some of the testimony. Is the determination though of subsistence -- does that have something to do with what portion of the diet is actually made up of the gardening or the local fishing product, and I appreciate also in the presentation, just now, you covered what were the indicators that led you in your observation to categorize something as subsistence fishing based on just, again, visual indicators that you had about it.

But if some portion of the definition of subsistence has to do with what proportion of the diet is made up of these types of foods, how do you determine that?

DANIEL MUSSATTI: We don't try to identify a specific proportion of the diet of the individual -- would come from the protein that comes from subsistence fishing. Whether it's five percent of their diet or ten percent of their diet, that would be very hard for us to determine.

What we're looking for is a general indicator that the harvesting of a natural resource for personal consumption is a way of being able to supplement your income so that you're freeing up resources that you have for other purposes whether it's other foods or, you know, clothing for your children, medicines, these sorts of things.

So it's a way of supplementing the income, and it's more than just for recreational purposes. There's a -- there's a business involved in this and that you need to do it. And it's -- there's been attempts before to put a threshold limit on it. Well, it has to be a significant part of the -- of the person's diet; so that means it has to be over half of it, but that's doesn't make very much sense from an environmental justice standpoint if somebody does this for a cultural reason or for an income reason. So we don't look for that income threshold. We just look for the behavior that would be fulfilling an income supplementing purpose.

COMMISSIONER SVINICKI: Okay. So in this portion or in this instance, the fact that it forms some portion of the diet is sufficient for you to put it in the category of subsistence really as a contrast with recreation is the real distinction that you're drawing here?

DANIEL MUSSATTI: I think that's a fair assumption or characterization.

COMMISSIONER SVINICKI: Okay. Thank you. And I have a question about -- maybe compare and contrast between the Corps' least environmentally damaging practicable alternative and the NRC's consideration of "obviously superior" from an environmental standpoint. And I wondered if someone broadly could just help with a further elaboration in the record on, you know, factors considered in identifying "obviously superior" in terms of a site from an environmental standpoint, maybe factors that would be considered there that wouldn't be considered for the least environmentally damaging practicable alternative and vice versa -- a little bit of a compare and contrast?

RYAN WHITED: I'll start with that. Actually, a good place to look

in the EIS to get a sense of this is Section 9.5. In Section 9.5, there's a discussion of additional information that the Corps needs for its [unintelligible] for determination. And what you'll see there is a table, a very quantitative table, a specific acreage of fill impacts and other impacts for each alternative site and the proposed site.

And basically, I mean, our understanding from the Corps is, if you look at that table and you look at -- and sum of all the numbers, and the least impact to aquatic resources -- unless there is some extenuating circumstance that that site couldn't be chosen as the preferred site, that's going to be the least environmentally damaging practicable alternative.

I mean, the Corps would like at extenuating circumstances, but it would have to be pretty substantial for them to get away from their authority to protect aquatic resources and use some other consideration to pick a different site.

COMMISSIONER SVINICKI: Yes. Would you like to add [inaudible] --

ANDREW KUGLER: Yes. Andrew Kugler, senior project manager in division site environmental review. I have been sworn in. When we started looking at this as we were starting to work with the Corps, this was something we were a little bit worried about because we were wondering how different our approaches might be.

And as Ryan pointed out, there are some differences and it's -- but it's mainly difference of emphasis. There's a very strong emphasize on the part of the Corps in looking at wetlands and waters of the United States; but in their basic premise, they're in a lot of respects, very similar because when they say "least environmentally damaging practicable alternative," they're

saying, "The first thing I'm looking for is which of these is least environmentally damaging?" But it does have to be practicable. It has to be something that can be done.

If there is, for instance, an extreme difference in the cost of developing a certain project at a given location, that can be considered as part of the practicable portion of it. When we look at "environmentally preferable" and "obviously superior," we're looking at some very similar things. We're measuring, first, is there an alternative site that, based just on environmental grounds, appears to be better than the proposed site by a margin that we can measure?

I mean, there's got to be a difference we can really see. And then, if there is an environmentally preferable alternative, we look to see, well, are there other factors such as cost and technical issues that would lead us to conclude that, even though it's environmentally preferable, it's not obviously superior? Or lacking those, we would conclude it is obviously superior.

So in some respects, they're very similar in their approaches. It's an emphasize that is a bill different. We're kind of broader in our look at it, whereas, the Corps, based on what regulations they're implementing, has more of an emphasis on the wetlands and waters of the U.S.

COMMISSIONER SVINICKI: Okay. Thank you. Ryan, did you have something?

RYAN WHITED: I would just add, -- you know, there's another example. We have had instances on some projects where applicants have had to readjust their site layout on-site, looking at on-site alternatives, because

the Corps felt that the current layout would not be the [unintelligible]. We weren't particularly concerned with the layout as it stood there, but they had to adjust that to meet the Corps needs.

COMMISSIONER SVINICKI: Okay. Thank you. Thank you, Mr. Chairman.

COMMISSIONER APOSTOLAKIS: Thank you. I just have a question about education. Why aren't you happy with just "superior"? Why does it have to be "obviously superior"?

[laughter]

MALE SPEAKER: It's not obvious that anyone wants to consider it.

[laughter]

ANDREW KUGLER: Well, actually, the terminology comes from a decision back in the late '70s; and the situation, there was -- there was a large number of alternatives, and people were saying, "Well, this one's better in this way"; "This one's better in that way."

And in looking at it, the decision led to the issue -- well, broadest to the point of saying, you know, "If it's just a little bit better on paper, is that enough to say, 'Well, we have to go with that alternative if this alternative looks a little bit better on paper.'"

And what drove the decision to say, "No, it really needs to be obviously superior" is the fact that the alternative sites are not looked at in as much depth as the proposed site. The proposed site has been turned over in all respects. We've got details surveys; we've got a lot of information on the proposed site. We know it really well. We basically know all the flaws. We don't expect to have any unexpected flaws when they go to build a proposed site.

The alternative sites we've looked at, but we don't go as deep. We don't have the depth of information. And so there's a very high likelihood that there are flaws associated with the alternative sites that we don't know about. And so what the board was saying was, "Therefore, it has to be obviously superior before we make a decision to go to an alternative [inaudible] --

[talking simultaneously]

COMMISSIONER APOSTOLAKIS: [unintelligible]

ANDREW KUGLER: I believe it's a licensing board decision. Yes. Licensing board decision, and I'm trying to recall the site.

MALE SPEAKER: [inaudible]

ANDREW KUGLER: Seabrook? I believe it's Seabrook. [unintelligible] Decision 78, I think. And so that's where the terminology actually first arose, and we've applied it since that time. It developed -- it's in our guidance in the environmental standard review plan.

SCOTT FLANDERS: I will just add it's also in the statements of consideration to the part 51 regulations that were promulgated in 1984. It talks about how we go about doing that, alternate site review in determination [unintelligible] are all obviously superior sites in the use of reconnaissance information.

COMMISSIONER APOSTOLAKIS: I'm impressed. Thank you.

[laughter]

MALE SPEAKER: Obviously.

[laughter]

CHAIRMAN JACZKO: Commissioner Magwood.

COMMISSIONER MAGWOOD: Well, see, first, I appreciate the effort the staff put into the environmental justice review. It's quite comprehensive. Both of you went personally to the area and interviewed people? Is that --

DAVID ANDERSON: Yes, we went together.

COMMISSIONER MAGWOOD: Just -- well, maybe to start off with that, it's -- well, I read in the EIS and some of the other materials -- very interesting. I wonder if you could give us more of a personal reflection on what life is like in that area.

DAVID ANDERSON: Very interesting question. I personally found the area to be depressed, economically depressed; and also my personal view of the attitudes of the people that we interviewed in the local area, the clergy and the political representatives, were that they felt some disenfranchisement from the political system in Fairfield County. On the other hand, there are -- we also find that there are many efforts going on to try and improve the economic situation of Fairfield County. There's a lot of business recruitment going on, a lot of manufacturing recruitment going on; and there's great anticipation of this proposed action being -- coming to fruition.

COMMISSIONER MAGWOOD: In Fairfield County itself?

DAVID ANDERSON: Fairfield County.

MALE SPEAKER: [inaudible]

DANIEL MUSSATTI: Everything that Dave says is spot-on. The only thing that I'd add is that the degree of poverty in the area was very striking. It's something that I did not expect to see still in the United States in some places where, literally, it was a tar paper shack with a corrugated metal roof on it for a home.

The only going concern of a business that was within a mile or so of the -- of the mayor's offices in Jenkinsville was a [unintelligible] portable trailer that was a chicken shack and then a gas station right at the intersection up to the -- up to the plant up to the Summer site.

There were no grocery stores in the area there, and with the lack of reliable transportation in the area, it must have been very difficult for them to be able to even get to the grocery store to be able to pick up what they needed. It was 15 miles away?

DAVID ANDERSON: Roughly.

DANIEL MUSSATTI: Roughly. And not exactly the best roads in the world to work on, to have to be on. So the area was depressed. This is almost the perfect word for it; and the people there had a level of despair or frustration that was very evident, and it was these attitudes that led us to start thinking in terms of how we could get them to vocalize and tell us what their concerns were because they didn't see any way for them to be able to be a part of the process, you know, because they were, you know, so isolated from the rest of the community.

COMMISSIONER MAGWOOD: Again, thanks for the extra effort to try to reach out to these people. You mentioned -- listening to you talk about the distance. It raises a question that I had when I read the analysis, and one area that came up as having moderate impact was traffic. What do we mean by that? I mean, obviously, rush hour isn't a big problem in Jenkinsville with walking everywhere; so what does "increased traffic" actually mean to these people? What does that actually do?

DAVID ANDERSON: Well, the example I can give you is what we most

often heard was for the those that are working in, say, Columbia, trying to turn left to get out onto one of these routes that goes back to Columbia is quite challenging, especially during the shift change times, you know, when folks are coming out to the site, and other folks from Jenkinsville need to get to Columbia. And until these -- the recent mitigation efforts that have started, you know, it's very challenging for [unintelligible].

COMMISSIONER MAGWOOD: Well, it sounds like there's a significant number of people that aren't going to Columbia to work. Sounds like there's a lot of people who are just in the area, you mentioned doing some subsistence gardening and fishing. Are they counted -- or do you consider them to be impacted by the traffic?

DANIEL MUSSATTI: Well, there's also a very strong religious community there in that they have very active churches all along that -- the route that Dave pointed out on the map, and a lot of their daytime is spent in commuting with their brothers and sisters at their church, and that would have been impacted quite heavily for one thing; and another thing is that with the traffic that would be expected at the peak employment period on -- during shift changes, if there were some sort of an emergency where they had to get in a rescue vehicle of some sort -- maybe somebody had a heart attack or something like this or a fire at their home -- the ability of the emergency vehicles to be able to get there in a reasonable time would also be a problem that be -- would have impacted that.

COMMISSIONER MAGWOOD: Okay. That helps. Appreciate that. [unintelligible] something -- a line of question [unintelligible] today. He started -- I actually thought she was going to go there, but she didn't quite

get to where I thought she was going; so let me finish where I thought it was going.

You indicated that there was not an assessment of the proportion of the diets that was coming [inaudible] subsidence [inaudible] gardening or fishing or whatever.

Does that affect how -- does this -- does that -- is the fact that they use subsistence methods affect how we get our dose of calculations for the population, or did we just not worry about that in this case?

MALE SPEAKER: This is independent of that?

DAVID ANDERSON: Although I would -- I would add that, you know, in doing the review, I consulted with the health physicist that does that dose modeling to indicate, you know, there's -- there is this population. We have observed subsistence fishing, and we know we have reports of, you know, significant backyard gardening. And I would defer to a health physicist, but I'm certain that those types of calculations are dealt with in the dose modeling as a matter of practice.

COMMISSIONER MAGWOOD: Is there anybody that can...

DONALD PALMROSE: Donald Palmrose, a senior project manager, Office of New Reactors. For the dose calculations, we use the codes LADTAP and GASPAR, and those include the pathways for the distribution of reactive material into the environment that makes assumptions as far as the consumption and -- of food and the drinking of water to the population and within the area; so if you were looking for exact numbers of what is used in those calculations, we'd have to probably go back and get a [unintelligible].

[talking simultaneously]

COMMISSIONER MAGWOOD: So there was some allowance made for the fact that some of the population is doing subsistence gardening and fishing?

DONALD PALMROSE: Would I -- I would have to verify that. So we'd probably have to [inaudible] --

[talking simultaneously]

COMMISSIONER MAGWOOD: Yeah. Let's get that for the record and make sure we understand how that was done because I guess I'm surprised that it wasn't part of the environmental justice assessment because, if the doses are higher, even if they aren't, you know, beyond part, you know, part 21 [unintelligible], it's still an impact.

DAVID ANDERSON: Well, we do look for the pathways; so if there was a pathway, you know, we would have -- we would have given it more discussion here in our limited time, but we didn't determine that there was a linkage to site activities and the fishing, for example.

COMMISSIONER MAGWOOD: Okay. Did -- just in the last few seconds we have, the -- just to clarify, our -- this is -- this is -- we were sort of talking about this morning. All right. NRC's role in all this is a little nebulous. We -- it's kind of like wetlands. We analyze impact on wetlands, but we have no authority of doing anything about wetlands. It falls into others -- the Corps [spelled phonetically].

In the case of environmental justice, same sort of thing; although I don't think there's anybody that picks up that particular ball. We analyze it, but there's not a lot we can do about it.

DAVID ANDERSON: We report the impacts.

DANIEL MUSSATTI: Our job is to provide you with the best possible

information that we can get so that you can make the best possible decision as far as the issuance of the COL. So we're just here to report what we see and look at the mitigation that would be able to dampen the effects to some extent, but I think you're right. I don't think this is -- I don't think NEPA has given us the power to do anything beyond that.

COMMISSIONER MAGWOOD: Appreciate it. Thank you very much.

CHAIRMAN JACZKO: Commissioner Ostendorff.

COMMISSIONER OSTENDORFF: Thanks, Mr. Chairman. I want to touch on the applicant a question, but I want to just kind of set the stage. I appreciated very much Dan and Dave's characterization of this area as being economically depressed-ridden [spelled phonetically] by poverty and frustration, disenfranchisement, et cetera, et cetera.

So in that notion, I want to ask the applicant, and then I want to come back to staff. The question to the applicant is, overall, does the local community around the proposed construction site view the construction of two additional units as a good thing or bad thing with respect to their economic future?

APRIL RICE: Based on feedback through the community coalitions that we've conducted over recent years, in a recent survey that we've conducted, they do see it as a good thing as was mentioned for job opportunities and benefits to the community. And we have done additional outreach during this process to make sure that there is two-way communication with individuals in the community.

COMMISSIONER OSTENDORFF: Follow up on that, April, with respect to the experience that your organization had with unit one, did the construction

of unit one enhance local area employment in this area?

APRIL RICE: I cannot speak to that. I don't know.

ALLAN TORRES: Statistical data for that time period probably wouldn't be available. But first hand knowledge on my part during the 70's during construction Unit 1, we employed over 5,000 employees over the peak of construction. Of course construction means the methods were significantly different during that time period, but we did employ a significant portion of the local community. And again, one of the environmental justice attributes that we contribute to on-site currently is we do track our impact of employment in the Fairfield County area and the specific county area. And currently in the Fairfield County area, we're currently employing about 37 workers. So if there's opportunities for the workers to become engaged, we are at that [inaudible].

COMMISSIONER OSTENDORFF: Thank you, Allan. Now [inaudible], you go back with the same kind of question for the staff here. And I appreciate it, and I'll start out with I appreciate that you had customized, tailored your approach to meet the appropriate needs of the local communities to asses their feelings, to capture their viewpoints, and I applaud you for doing that. Overall, macroscopic question from what you know today is the construction of the proposed two units, is that being viewed as a good thing or a bad thing by the local community?

DANIEL MUSSATTI: It depends on who you talk to in the community. There are some that feel that they are not going to be able to get any benefit from it all, they're just going to get all the traffic in passing, and they're going to get, you know, just rolled in over when it comes to any benefits that

might come from it. And these are the people that are frustrated, and have limited access to being able to have transportation to get to work. When you get into the larger communities where the Chambers of Commerce are, and where they can see what the benefits are going to be, they tend to be much more positive towards this. But I think there still is some reluctance to appreciate what the two plants will bring to them in some parts of the community.

DAVID ANDERSON: All right, if I could just add a little bit to that. We heard yesterday from the applicant, and this was confirmed during our review as well, that there are several local programs that have bee developed in cooperation with the community colleges in the area to try and train and then immediately hire those certified graduates of training programs at the local community colleges there in the Midlands area of South Carolina. So the problem is understood in the local community, and there are efforts that certainly we're aware, that I believed we mentioned in the [inaudible], that these efforts are ongoing to recruit business and to train a local workforce as best as possible.

COMMISSIONER OSTENDORFF: Let me ask this related question. In your community meetings down in South Carolina, was the aspect of enhancing the tax base and the tax revenue from additional units, was that discussed or explained to the local community?

DANIEL MUSSATTI: I believe so.

COMMISSIONER OSTENDORFF: Okay. Let me just, because I've touched on a couple things here. Does the applicant have anything to add to what the staff may have said about any local community aspects or understandings of

economic or other impacts of the proposed construction?

APRIL RICE: I don't believe we have any additional information to provide.

COMMISSIONER OSTENDORFF: Okay. Thank you. Thank you, Mr. Chairman.

CHAIRMAN JACZKO: Well, thank you. This concludes our panel presentations. We will take a break until 12:00, to give all the lawyers a chance to summarize and conclude, and then we'll come back for our closing and summary statements. Thank you.

(Whereupon, a short recess was taken)

CHAIRMAN JACZKO: Okay, well now we have an opportunity for closing comments by first the applicant, and then the staff. And again, if I could ask each of the persons at the table to state their name and their title.

MICHAEL JOHNSON: Michael Johnson, Director of the Office of New Reactors.

FRANK AKSTULEWICZ: Frank Akstulewicz, it's Deputy Director of the Division of New Reactor and Licensing, Office of New Reactors.

SCOTT FLANDERS: Scott Flanders, Director of Division of Site and Environmental Reviews, Office of New Reactors.

STEPHEN BYRNE: Stephen Byrne, Executive Vice President for Generation and Transmission, and Chief Operating Officer for South Carolina Electronic and Gas.

ALFRED PAGLIA: Al Paglia, Manager of Nuclear Licensing and Nuclear Performance, South Carolina Electric and Gas.

STEPHEN BYRNE: Good afternoon, Mr. Chairman and Commissioners. I

would like to make one correction to one slide we used yesterday during our opening, and that was slide number 20. On that slide we listed a number of permits. And one permit we listed as needed to get approved yet with a FIRC license amendment for water use. We got that approvals while we were in the hearings yesterday. So quick update to slide number 20. I'd like to again thank the Commission for conducting this mandatory hearing for the two new nuclear units utilizing the AP1000 technology at our VC Summer nuclear station. As I stated in my opening presentation, this is indeed an important milestone in the licensing of these two new units, and marks the culmination of tremendous effort by many organizations including the NRC staff. As the first SCOLA, SCENG has a unique perspective on the benefits of standardization, through not only its participation in NuStart, the DCWG, and APOD, but also the realization of corresponding licensing efficiencies. In addition, these two days of hearings have made apparent the depth and thoroughness of the staff's review. We appreciate the Commission's thoughtful questions and comments regarding our project, and we have answered many of those questions already. But we'll provide follow-up information on a couple of the items raised during the hearing, and we'll answer any additional post-hearing questions you may pose during the coming days. Of greatest importance, we believe that the Commission can make the safety and environmental findings necessary to issue the combined licenses for VC Summer Units 2 and 3. I'd like to clarify or reemphasize a couple of topics raised over the past few days in this mandatory hearing. First, we are confident in the AP1000 design. As I noted during my opening presentation, we purposely selected the AP1000 for a variety of reasons. Chief among them being safety features including its ability to

provide 72 hour station black out coping capability. Second, I'd like to reiterate the benefits of co-location of the technical support center, or TSC.

These benefits include a consolidated site-wide response capability, unified command and control, not having to staff multiple TSCs in an event affecting more than one unit, and the ability to rapidly staff the facility from off-site locations. There's been a significant amount of discussion about the need for a license condition to address the recommendations of the Fukushima near-term task force. I'd like to reemphasize that we do not believe that a license condition is necessary. The existing regulatory frame work already provides the agency with ample authority to impose any new regulatory requirements eventually determined to be necessary. As an existing plant, Unit 1 will comply with any applicable regulatory changes, and similarly, once issued their COLs, Units 2 and 3 will have to comply with applicable new regulatory requirements, as would any licensee. Mr. Chairman and Commissioners, I want to thank you again for your participation in this mandatory hearing, and finally I'd like to invite you ad your assistants to come to our site, and to our state. South Carolina is a supportive environment for a new nuclear employment.

We touched already upon the educational institutions that are supporting our project, and you're obviously aware of the seven operating reactors in the state. But in addition, we also have the DOE Savannah River site, the Westinghouse Nuclear Fuels Plant, the Barnwell Low-Level Radioactive Waste Facility, which is still open to South Carolina utilities, and the Navy Nuclear Training Command in Charleston. I would be remiss if I did not also mention the state's base load review act. If by statute also SCENG to recover

the financing costs and earn a return equity during construction until of waiting until the plants are in service.

We talked a little bit about the community here today. The community from my perspective is perhaps not as bleak as has been portrayed. But we would like you to see it. It is a very rural community, it covers a very large surface area, and has only about 24,000 residents. The jobs number, the SHAW direct craft employment numbers from Fairfield County indicate that we have 59 individuals, not 37, but 59 individuals working at craft on the project. That would be in addition to any management folks, or SCENG or SCANA personnel that would be working on [inaudible].

We also provide jobs for some local companies. In addition to things like catering companies, our surveyor comes from Jenkinsville. Taxes. We currently pay about 20 million dollars in taxes to the County. The two new Units are obviously going to have a significant positive impact on tax money. Some of the frustration that you heard discussed today was with the political structure in the county. We give our tax money to the county. What the county does with it is up to the county. We understand there are some concerns about the distributions of that money or those resources in the county. But that is not something that SCE&G has any control over.

Recreation. When we built VC Summer Unit 1, obviously we built the 1,600-acre lake, Monticello Reservoir. We also built a 300-acre recreation lake that is used by a lot of county residents, particularly western Fairfield County residents and Jenkinsville residents. We also built a county park at roughly the same location, which is, again, utilized by a lot of western Fairfield County and Jenkinsville residents. And we have, because of our new

projects, for the first time we've got a post-secondary, or higher education, institution with a brick-and-mortar facility in the county. Midlands Technical College completed construction last year of a facility that will do training for craft-level employees in the county. These are things like welders, pipe fitters, form carpenters, that kind of thing. They started their first class in January. In that facility, they included some community rooms and kitchen, which the community asked for. So I think that that's a very positive aspect of these two new plants on the county.

And speaking of jobs, somebody asked the question about jobs during the construction of Unit 1. There were a significant number of county residents that got jobs during the construction of Unit 1. Many of you are aware of our chief nuclear officer, Jeff Archie. Jeff grew up about three miles from the site. And you can recant when the lake was first flooded. He worked for us during a student, during construction. Jeff is now our chief nuclear officer. Jeff is very attuned to the needs of the county. Jeff still goes to church in Jenkinsville. So from a community impact perspective, a community relations perspective, I think we do have our fingers on the pulse of the county. And again, I want to thank you for conducting this mandatory hearing.

CHAIRMAN JACZKO: Thank you, staff [spelled phonetically].

MICHAEL JOHNSON: Good afternoon, chairman, commissioners. On behalf of the over 100 technical specialists, scientists, and engineers who participated in the review, including folks who appeared before you over the last day and a half, I'd like to thank the Commission for providing us the opportunity to discuss the Summer Units 2 and 3 combined license application.

In closing, I'd like to make the following points. In the staff statement a support of the COL and FSER and the FEIS and in our presentations during the hearing, we explained why all of the findings necessary to issue combined licenses can be made. The review was appropriately focused on finality, according to the issues within the scope of the referenced AP1000 design certification. We demonstrated thoroughness of our safety review. We explained our review process, the use of staff guidance, and interactions with the ACRS, including the ACRS's agreement with the staff's conclusions regarding summer application.

In our hearing presentation, we highlighted the novel aspects of the safety and security review, particularly with regard to the wet bulb temperature exemption and the size of the emergency planning zone.

We also explained the adequacy of our environmental review, including the process for developing the final EIS, the assessment of environmental impacts, the analysis of alternatives, conclusions and recommendations in the final environmental statement, and the novel aspects of the environmental review associated with the environmental justice interactions and with interactions with the U.S. Army Corps of Engineers.

The staff has found that the application, the final safety evaluation report, the final environmental impact statement, and our statement in support of this hearing provide an adequate basis for meeting the necessary regulatory findings set forth in 10 CFR 52.97 and 10 CFR 51.107. These regulatory findings support the issuance of the combined licenses for Summer Units 2 and 3.

We're confident, with respect to the work that was done by the

staff, in consultation with OGC to support the regulatory findings as previously discussed. We're similarly confident, with respect to [inaudible] 52 processes related to post-COL issuance activities and the tolls, including ITAAC, construction oversight processes, inspection of construction, including inspection of operational programs, and inspection oversight of transition from construction to operations. All of these activities will enable us to confirm that the plant will have been built and will operate in conformance with the license, the act, and the Commission's regulations.

I note that there were questions raised during the course of the mandatory hearing, including questions regarding our response to pre-hearing question 1A, Fukushima near-term taskforce recommendations, and the staff's preference for when those recommendations would be implemented. A response to the Commission's post-hearing questions from the Vogtle mandatory hearing, the staff will provide a potential pass forward to the Commission for consideration in addressing the near-term task recommendations, in the event the Commission decides to do so. We believe that the response will be applicable to Summer as well and will be responsive to the questions that were provided by the Commission during yesterday's overview presentation. Of course, we'll provide supplemental responses to all the questions that were raised during this hearing in accordance with the established procedures and direction provided by the Commission. The staff has appreciated the opportunity to present to the Commission the results of our review. This concludes the staff's closing remarks.

CHAIRMAN JACZKO: Well, thank you. I would just say, just briefly, and then we'll have some housekeeping things to summarize at the very end. As

we're thinking [spelled phonetically] the Vogtle hearing, we've seen that there are a number of issues, a lot of work has been done by the staff and by the applicant to prepare for the hearing. There are issues that came up. I think it's a testament to this process that there are things that, perhaps, give the Commission some thoughts about some conditions we may want to put or add to the license application. That would raise some good issues with the TSC that we may want to just take a look at and see. Clearly there are issues that were raised in the Vogtle that related more directly to the AP1000. Those will be looked at or addressed in the rule making, which is still to be completed.

The, as I look out, this is, I think, a very significant effort on the part of a lot of different people. That's obvious. I think that came through very much. We nibbled, perhaps, on a small piece of what is in the record in front of us. And ultimately we will have to make a decision about our comfort with the findings. And that will be the activity for the Commission as we go forward in the next couple months, as we wade through this information, as well as the existing thesis of the record. So I look forward to getting the response on Vogtle for the possible path forward on Fukushima action. And again, just formally for the record, we'll just request that that be submitted to this record as well. And with that, again, I think it was a very good, thorough presentation from you and from the applicant. And I'd ask my colleagues if they have any closing remarks.

COMMISSIONER SVINICKI: Thank you. I have one closing question. And I'll make some brief remarks. This is the exact question I asked in closing in the Vogtle hearing as well. But it regards the changes during construction license condition, which provides the ability for a licensee in

conjunction with a license amendment request, to request a notification that the NRC has no objection to the licensee constructing the proposed change design feature pending NRC's review of a license amendment request. I would ask the applicant, do they currently contemplate, or are they aware of any such request that they expect to file?

ALFRED PAGLIA: We are not currently aware of any licensing amendments that were required of preliminary acceptance review.

COMMISSIONER SVINICKI: Thank you very much. And in the way of closing remarks, similar to the chairman has indicated and Mike Johnson acknowledged the work of over 100 hard-working staff, I think if we were to add in a number of important support functions it would be even a larger number than that. So I acknowledge and thank the applicant for their vigorous defense and their responsiveness to my questions.

And again, I congratulate the staff on reaching this milestone and look forward to working with my colleagues on the Commission on a thoughtful deliberation of our support of the necessary findings. Thank you, Mr. Chairman.

COMMISSIONER APOSTOLAKIS: Thank you. I just want to say that I found the range of issues that were explored in the depth of the analysis that were performed, both by the applicant and the staff, very impressive. And I thank you very much for it. Thank you, Mr. Chairman.

CHAIRMAN JACZKO: Commissioner Magwood.

COMMISSIONER MAGWOOD: Well, thank you for the last day and a half. It's been a very educational discussion. Appreciate all the work that's gone on both sides, the applicant as well as the staff. Both sides have presented

themselves well today. Also, I wanted to thank people on my staff, Molly [spelled phonetically], Rebecca [spelled phonetically], Bill [spelled phonetically] that helped put this together. I also wanted to thank Mark Enosky [spelled phonetically], who was on loan and did a fantastic job. We appreciate his assistance. I do want to, again, for the record, chairman emphasizes the issue of the TSC. I think it's important to get a full regulatory analysis to explain exactly the basis for the departure. I want to make sure that there is a clear basis for what we're doing there. I want to understand it myself.

And I'll have some other questions for the record, as my colleagues will as well, as I imagine. I do have one general question for both the staff and the applicant. As you know, the fact that this hearing exists was something of a matter of small controversy in some circles, as to whether we should even have a mandatory hearing. And there's been efforts here and there to eliminate this entirely through legislation. Just curious, now that you've gone through it, start with you, Steve, any thoughts about whether this has been a worthwhile process? And do you feel that you benefit from it? Or do you think, or do you have thoughts about whether it should be either elimina -- or maybe take it from the Commission maybe back to a licensing board? Any thoughts like that?

STEPHEN BYRNE: Well, let me just say that if you have to have a hearing like this, I certainly appreciate the Commission conducting here. I think the opportunity to inform a group like this that has to make a decision this significant is a good opportunity. Getting back to the question as to whether or not we think one is necessary when there are no contentions, I think

I would have to say that from the perspective of an applicant who is going through a process that wants to get to the end of that process, obviously, we would view the step of a hearing, regardless of who the hearing would be adjudicated by, is not necessary.

COMMISSIONER MAGWOOD: Mike, any thoughts?

MICHAEL JOHNSON: Without offering a position about whether I think it's necessary, I think going into this I had a certain perspective. But I've gained a more favorable perspective, actually, with respect to what this hearing actually brings the staff, as we've discussed, provides tremendous effort, in terms of doing a review. And these are important decisions. The ability for the staff to be able to demonstrate the sufficiency of the review on a decision like this in this kind of a hearing. Opportunity, I think, provides visibility from process that might not ever get that kind of visibility. So from that perspective, I think it's a worthwhile endeavor.

COMMISSIONER MAGWOOD: I think, I'll share this. I've had a similar experience going through this and the previous hearing. I was skeptical as to how much value there was in it. And I think that even despite the fact it's happening at a very high level, I think it's been a worthwhile exercise. And I think my views are similar to what you've expressed. Just one more question for you, Mike. You probably knew this was coming. Can you tell me, Mike, for the record, do you believe, personally, that from everything you know and everything you've observed, is this plant safe to build and operate?

MICHAEL JOHNSON: Yes, this plant is safe to build and operate.

COMMISSIONER MAGWOOD: Thank you, very much. Thank you, Mr. Chairman.

COMMISSIONER OSTENDORFF: I don't have any questions. I just want to thank the applicant and the staff for their hard work and professionalism. Thank you.

CHAIRMAN JACZKO: Well thank you, everyone, for a very productive hearing. The commission has in front of it, now, a very important licensing decision. And I believe that this issuance of an operating license is certainly among the most important decisions entrusted to the agency's judgment. This license, if granted, will not only authorize the construction but also the operation of the plant for 40 years, a period of time that exceeds the entire length of the NRC's history. Our discussions over the past day and a half have demonstrated that this application, like any application to build and operate a nuclear power plant, involves a broad range of complex safety, security, and environmental issues. It's clear that the staff has done a tremendous amount of work in carefully and thoughtfully reviewing these issues, as has the applicant during the application. And as many have said, I want to thank both the staff and the applicant for their presentations and their responses to our questions.

I believe the Commission is committed to moving forward and reaching a final decision on this hearing in a timely, thoughtful manner that befits the important issues under our review. At this point, we have now conducted mandatory hearings on two new reactor license applications. And we are approaching the final decisions on them.

In looking back on this experience, I believe that the licensing process has worked very effectively in helping us meet our safety and security mission. That is certainly a success. Each success is a credit to many people

working on the Commission and many people who've worked on the Commission before any of us were here. This entire part two [spelled phonetically] process goes way, way back. Maybe way back. And although the process has seemed to work well, I believe that we do have the responsibility, especially as an agency, committed to continuous improvement. And I personally committed to several people that we will examine this experience and see if there are lessons learned where we can improve the process going forward. But as Commissioner Magwood said, I do think it was a very effective and useful effort for the Commission to undertake. So I look forward to discussing with my colleagues and the staff in the next year or so how we go about looking at those lessons learned and what lessons we will learn.

But for the short term, I think we have had a very productive hearing. And we do have work in front of us before we ultimately reach a decision on this application. So in that regard, we will have an opportunity for additional questions from the Commission and look forward to prompt answers to those from the staff and the applicant. An order will be issued within the next seven days regarding those supplemental responses and any follow-up questions. The party should coordinate regarding any additional exhibits included with your responses, so they are shared in advance and the Commission is informed of any objections by the time they are submitted. We expect the transcript of this hearing to be available within a few days. At that time, the secretary will issue a short order identifying the deadline for any transcript corrections. Although there is still some work ahead for the applicant, the staff, and the Commission, I believe this has been a very productive hearing. Thank you all for your participation. And that concludes

our time.

(Whereupon, at 12:26 p.m., the above-entitled matter was concluded)

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

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
SOUTH CAROLINA ELECTRIC	)	
AND GAS COMPANY, ACTING FOR ITSELF	)	
AND AS AGENT FOR THE SOUTH CAROLINA	)	Docket Nos. 52-027-COL and 52-028-COL
PUBLIC SERVICE AUTHORITY (ALSO	)	
REFERRED TO AS SANTEE COOPER)	)	
	)	
(Virgil C. Summer Nuclear Station, Units 2 and 3)	)	
	)	
(Mandatory Hearing)		

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing **ORDER AND OFFICIAL TRANSCRIPT FOR THE HEARINGS HELD ON OCTOBER 12 AND 13, 2011, ON THE COMBINED LICENSES FOR VIRGIL C. SUMMER NUCLEAR STATION, UNITS 2 AND 3** have been served upon the following persons by Electronic Information Exchange.

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Virgil C. Summer, Docket Nos. 52-027 and 52-028-COL (Mandatory Hearing)
ORDER AND OFFICIAL TRANSCRIPT FOR THE HEARINGS HELD ON OCTOBER 12 AND 13, 2011, ON THE COMBINED LICENSES FOR VIRGIL C. SUMMER NUCLEAR STATION, UNITS 2 AND 3

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[Original signed by Nancy Greathead]
Office of the Secretary of the Commission

Dated at Rockville, Maryland
this 17th day of October 2011