UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of DUKE ENERGY CAROLINAS, LLC (William States Lee III Nuclear Station, Units 1 and 2)	Docket Nos. 52-018-COL 52-019-COL

ORDER
(Setting Deadline for Proposed Transcript Corrections)

The Commission held an evidentiary hearing on October 5, 2016, 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 17, 2016. Transcript corrections should be limited to the identification of transcription errors that are material to the substance of the testimony or statements involved. The parties may coordinate their responses and file a joint set of corrections.

IT IS SO ORDERED.

For the Commission

NRC SEAL

/RA/

_____
Annette L. Vietti-Cook
Secretary of the Commission

Dated at Rockville, Maryland,
this 11th day of October, 2016.

Official Transcript of Proceedings

NUCLEAR REGULATORY COMMISSION

Title: Hearing on Combined Licenses for William States Lee III Nuclear Station, Units 1 and 2: Section 189a of the Atomic Energy Act

Docket Number: N/A

Location: Rockville, Maryland

Date: October 5, 2016

Work Order No.: NRC-2611 Pages 1-161

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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HEARING ON COMBINED LICENSES FOR WILLIAM STATES LEE III NUCLEAR STATION, UNITS 1 AND 2: SECTION 189a OF THE ATOMIC ENERGY ACT

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WEDNESDAY,

OCTOBER 5, 2016

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ROCKVILLE, MARYLAND

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The Commission met in the Commissioners' Hearing Room at the Nuclear Regulatory Commission, One White Flint North, 11555 Rockville Pike, at 9:00 a.m., Stephen G. Burns, Chairman, presiding.

COMMISSION MEMBERS:

STEPHEN G. BURNS, Chairman

KRISTINE L. SVINICKI, Commissioner

JEFF BARAN, Commissioner

ALSO PRESENT:

ANNETTE VIETTI-COOK, Secretary of the Commission

MARGARET DOANE, General Counsel

NRC STAFF:

FRANCIS AKSTULEWICZ, Direct, Division of New Reactor Licensing (DNRL), Office of New Reactors (NRO)

DAN BARSS, Office of Nuclear Security and Incident Response

PEYTON DOUB, Office of New Reactors (NRO)

BRIAN HUGHES, Senior Project Manager, Office of New Reactors (NRO)

ANDREW KUGLER, Office of New Reactors (NRO)

SAMUEL LEE, Acting Deputy Director, Division of New Reactor Licensing (DNRL), Office of New Reactors (NRO)

VONNA ORDAZ, Deputy Director, Office of New Reactors (NRO)

ROBERT ROCHE-RIVERA, Structural Engineer, Office of New Reactors (NRO)

GERRY STIREWALT, Office of New Reactors (NRO)

KENNETH THOMAS, Emergency Preparedness Specialist, Nuclear Security and Incident Response

PATRICIA VOKOUN, Project Manager, Office of New Reactors (NRO)

MEGAN WRIGHT, Counsel for NRC Staff

ALSO PRESENT:

CHRISTOPHER FALLON, Vice President, Nuclear

Development, Duke Energy

ROBERT KITCHEN, Director, Licensing Nuclear Development, Duke Energy

DAVID LEWIS, Attorney, Pillsbury Winthrop Shaw Pittman

PAUL SNEAD, Manager, Siting and Licensing Support, Duke Energy

LAWRENCE TAYLOR, Lead, Procedure and Program Development, Nuclear Development, Duke Energy

JOHN THRASHER, Director, Engineering Nuclear Development, Duke Energy

LANCE VAIL, Senior Research Engineer, Pacific Northwest National Laboratory

A G E N D A

T A B L E O F C O N T E N T S

P R O C E E D I N G S

8:53 a.m.

CHAIRMAN BURNS: Before we proceed to this morning's hearing, we have an affirmation item to come before us and I'll ask the Secretary to read us through that please.

MS. VIETTI-COOK: This matter involves the application of the U.S. Department of Energy National Nuclear Security Administration to export up to 130 kilograms of highly enriched uranium to France's CERCA facility at the Institute Laue-Langevin. The Commission is being asked to act on a Memorandum and Order that would respond to a request for hearing and petition to intervene filed by Dr. Allen Kuperman on his export license application.

The Commission has voted to approve a Memorandum and Order that denies Dr. Kuperman's hearing request and directs the Office of International Programs to issue the export license. Would you please affirm your votes?

(Chorus of ayes.)

MS. VIETTI-COOK: That's all I have. Thank you.

CHAIRMAN BURNS: All right. We'll close the affirmation session and then we'll proceed to

today's hearing. I'll ask counsel to come to the table for the applicant and for the staff. While they're getting settled, I want to welcome Duke Energy Carolinas, members of the NRC staff, members of the public and those who may be observing or listening to today's hearing remotely.

The Commission is hear to conduct an evidentiary hearing on Duke Energy Carolinas' application for combined licenses to construct and operate two new nuclear power plants at a site in Cherokee County, South Carolina. This hearing is required under Section 189 of the Atomic Energy Act of 1954, as amended.

The Commission will also be reviewing the adequacy of NRC's staff environmental impact analysis under the National Environmental Policy Act of 1969, commonly referred to as NEPA. The general order of the hearing is as follows:

Duke and the staff will provide testimony and witness panels that provide an overview of the application, as well as address safety and environmental issues associated with its review, with Commission questions following the panels.

The Commission expects to issue a decision after the hearing promptly with due regard to the

complexity of the issues after it makes the following necessary findings. On the safety side, the Commission will determine (1) whether the applicable standards and requirements of the Atomic Energy Act and the Commission's regulations, specifically those in 10 C.F.R. Section 52.97 have been met; (2) whether any required notifications to other agencies or bodies have been duly made; (3) whether there is reasonable assurance that the facility will be constructed and will operate in conformity with the license, the provisions of the Atomic Energy Act and the Commission's regulations; (4) whether the applicant is technically and financially qualified to engage in the authorized activities; and (5) whether issuance of the license would be inimical to the common defense and security or to the health and safety of the public.

On the environmental side, under 10 C.F.R. 51.107 subparagraph (a), the Commission will (1) determine whether the requirements of the National Environmental Policy Act, Sections 102(2)(a) and (2)(c) and (2)(e) and the applicable regulations in 10 C.F.R. Part 51 have been met.

Second, independently consider the final balance among conflicting factors contained in the record of the proceeding, with a view to determining

the appropriate action to be taken, and (3) determine after weighing the environmental, economic, technical and other benefits against environmental and other costs and considering reasonable alternatives, whether the combined license should be issued, denied or appropriately conditioned to protect environmental values; and (4) determine whether the NEPA review conducted by the staff has been adequate.

This meeting is open to the public and we do not anticipate the need to close the meeting to discuss non-public information. However, if a party believes that the response to a question may require reference to non-public information, then that party should answer the question to the extent practicable with the information in the publicly available record, and file any non-public response promptly after the hearing on the non-public docket.

Before we proceed, I'd ask my fellow Commissioners whether they have any opening remarks. Commissioner Svinicki.

COMMISSIONER SVINICKI: Thank you Mr. Chairman. Good morning, and I join you in welcoming the applicant witnesses and the many staff experts who are gathered here today to engage in a defense of their review of the application. This seems like it's

deja-vu all over again, because we recently had a mandatory hearing not dissimilar from today and I think I was noting this morning, I think this has to be true, that at this point Mr. Chairman, you have presided over more Part 52 COL mandatory hearings than any chairman in the history of the NRC.

I realize there's some artificialities in that statistic. But I congratulate you on that and --

CHAIRMAN BURNS: We'll go for a win wherever we get it.

COMMISSIONER SVINICKI: Okay, there you go. All right. Well thank you again.

CHAIRMAN BURNS: Thanks Commissioner. Commissioner Baran.

COMMISSIONER BARAN: Well I also want to thank the witness and the staff and from Duke in advance for their preparation. I know it takes time to prepare, but I think these uncontested hearings are very valuable. This is the fifth uncontested hearing during my time on the Commission and your time as chairman, and although we haven't been here for all seven like Commissioner Svinicki has been, but I've been consistently impressed with how helpful they are to our deliberations on whether to issue a particular combined license.

And my observation is that the hearings are getting smoother and smoother as the staff and applicants get more and more familiar with them. I think the NRC staff at this point has gotten pretty used to these, and I suspect actually the Duke folks aren't far behind at this point. So I look forward to your presentations and responses to our questions. Thanks.

CHAIRMAN BURNS: Thank you, Commissioners. We'll proceed now with some other preliminaries, and first we'll start with the swearing of witnesses. I'll ask counsel for Duke to introduce yourself.

MR. LEWIS: My name is David Lewis. I'm from the law firm Pillsbury Winthrop Shaw Pittman, representing Duke Energy.

COMMISSIONER SVINICKI: I think it was off.

MR. LEWIS: Should I do it again?

CHAIRMAN BURNS: Yeah. I think that probably would be a good idea.

MR. LEWIS: My name is David Lewis. I'm from the law firm Pillsbury Winthrop Shaw Pittman, and I'm representing Duke Energy.

CHAIRMAN BURNS: Okay, thanks. What I'm going to ask you to do now counsel is read the names

of Duke's witnesses, and as the witness hears their name read, I would ask them to stand.

MR. LEWIS: Duke's witnesses are Mr. Christopher Fallon, Mr. Robert Kitchen, Mr. John Thrasher, Mr. Lawrence Taylor and Mr. Paul Snead.

CHAIRMAN BURNS: Okay. Thanks gentlemen. Is there any -- what I'm going to ask first is that you raise your right hand while I read the oath, and at the end of the oath obviously answer the question. 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?

WITNESSES: I do.

CHAIRMAN BURNS: I acknowledge that each of them answered affirmatively. Are there any objections counsel for the staff, to including the witness list as part of the record?

MS. WRIGHT: None from staff.

CHAIRMAN BURNS: Okay. In the absence of objections, the witness list is admitted to the record. And gentlemen, you may sit down. Thank you. Now I'll ask counsel for Duke to -- I'll ask whether there are any changes to your exhibit list for this proceeding?

MR. LEWIS: There are no changes.

CHAIRMAN BURNS: Would you read the range of numbers of the exhibits to be admitted?

MR. LEWIS: Yes. Duke Energy's exhibits are Exhibit DEC-1 through DEC-11.

(Whereupon, the above-referred to documents were marked as DEC Exhibit Nos. 1 through 11 for identification.)

CHAIRMAN BURNS: Okay, thank you. Is there a -- do you move to admit the exhibits?

MR. LEWIS: Yes, we do.

CHAIRMAN BURNS: Okay. Any objection?

MS. WRIGHT: No objections.

CHAIRMAN BURNS: Okay. In the absence of objections, the exhibits and the exhibit list are admitted into the record. So now we'll turn to the staff and go through the same. Counsel, would you please introduce yourself?

(Whereupon, the above-referred to documents were received into evidence as DEC Exhibit Nos. 1 through 11.)

MS. WRIGHT: Certainly. I'm Megan Wright, counsel for NRC staff.

CHAIRMAN BURNS: Okay. Would you again read the names of staff witnesses, and as the witness name is read, please stand and if you are -- if you

cannot see me, you need to move to a place where we have eye contact, because I know in this room there's some pillars. So counsel, I ask you to proceed with the reading of the list.

MS. WRIGHT: There are 13 names on the list that was filed on September 30th of the staff witnesses that are not present. Would you like me to read those as well, or just the witnesses that are present?

CHAIRMAN BURNS: I think -- well, the witnesses who are not present aren't going to provide testimony today; correct?

MS. WRIGHT: We don't expect them to.

CHAIRMAN BURNS: Okay. So why don't you just proceed with the ones who are here and we would expect to hear testimony from today.

MS. WRIGHT: Okay, thank you. Okay. For our safety witnesses, we have Frank Akstulewicz, Clinton Ashley, Dan Barss, Anthony Bowers, Robert Caldwell, David Curtis, Stephanie Devlin-Gill, Jennifer Dixon-Herrity, Steven Downey, Robert Fitzpatrick, John Frost, Greg Galletti, Joseph Giancinto, Anne-Marie Grady, Vladimir Grazier, Zachary Gran, Syed Haider, Charles Harbuck, Michelle Hart, Shawn Harwell, Raul Hernandez, Kaihwa Hsu, Brian

Hughes, Joel Jenkins, Henry Jones, James Kellum, Edmund Kleeh, Ronald LaVera, Samuel Lee, Yueh Li, Kos Lois, Timothy Lupold, Michael McCoppin, Matthew Mitchell, John Monninger, Wendell Morton, Lynn Mrowca, Charles Murray, Ryan Nolan, Eric Olvera, Vonna Ordaz, Pravin Patel, Michael Patterson (sic), Paul Pieringer, Meralis Plaza-Toledo, Kevin Quinlan, Sheila Ray, Robert Roche-Rivera, John Rycyna, Sujit Samaddar, Thomas Scarbrough, Gerry Stirewalt, Angelo Stubbs, Edward Stutzcage, Emil Tabakov, Frank Talbot, Albert Tardiff, Kenneth Thomas, Vaughn Thomas, Boyce Travis, Richard Turtil, Jennifer Uhle, Robert Vettori, Weijun Wang, Yuken Wong, Deanna Zhang and Jack Zhao.

CHAIRMAN BURNS: Okay, thanks. So I ask the witnesses to raise their right hand while I read the oath, and then answer the oath. 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?

WITNESSES: I do.

CHAIRMAN BURNS: If anyone had a problem with taking the oath, I want you to identify yourself.

(No response.)

CHAIRMAN BURNS: All right, there being none, are there any objections to the witness list as

being made part of the record counsel?

MS. WRIGHT: Mr. Chairman, if I may, we have some environmental witnesses as well.

CHAIRMAN BURNS: Oh we have? Okay. Well let's -- the safety witnesses can sit down. That way I can also, I think we can also see, distinguish who they are. So we have no objection to the introduction of the safety witnesses. I apologize counsel. Go ahead and read the list of environmental witnesses.

MS. WRIGHT: Sure. It's much shorter, so Jennifer David, Peyton Doub, Allen Fetter, Stacey Imboden, Andrew Kugler, Michael Masnik, Donald Pomrose, Lancy Vail and Patricia Vokoun.

CHAIRMAN BURNS: Okay. I'll ask you, as with the others, to raise your right hand and answer the question posed to you in the oath. 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?

WITNESSES: I do.

CHAIRMAN BURNS: I do, thank you. You may be seated. Are there any objections to the list or the witnesses?

MR. LEWIS: No objection.

CHAIRMAN BURNS: Hearing none, they are so

admitted. We'll go then to the staff in terms of admission of evidence. Counsel for the staff, are there any changes to your exhibit list?

MS. WRIGHT: No, there are not.

CHAIRMAN BURNS: Would you read the range of numbers in the exhibits to be admitted?

MS. WRIGHT: Certainly. It's NRC 001 through NRC 014R.

(Whereupon, the above-referred to documents were marked as NRC Exhibit Nos. 1 through 14R for identification.)

CHAIRMAN BURNS: Okay. Is there a motion to admit --

MS. WRIGHT: So moved.

CHAIRMAN BURNS: So moved. Are there any objections to the list or the evidence?

MR. LEWIS: No objections.

CHAIRMAN BURNS: No. Hearing no objection, the exhibits and the exhibit list are admitted into the record. Thank you. I think that deals with -- and it does the preliminaries. We'll proceed to the panels, as counsel can take their seats on the side of wherever it got you, and then we'll start with our first panel.

(Whereupon, the above-referred to

documents were received into evidence as NRC Exhibit Nos. 1 through 14R.)

For our first presentation, Duke will provide an overview of its application. After each overview panel, we will have a round of questions from the Commission, and then for subsequent sessions, the safety panel and the environmental panel, both Duke and the staff will testify and at that point we'll follow with an opportunity for Commission questions.

Just so you are aware, the Commissioners have an opportunity to bank their time as they see fit to focus on particular questions or areas of interest, and we'll rotate the order of questioning during the day.

So with that, I think we'll proceed with the first panel which is Duke. Again, I'd advise the witnesses that they are under oath, and that they should assume that the Commission is familiar with their prehearing filings.

One comment I will make is that while we have the panels set, sometimes you may draw on another witness for your side that may have been sworn in, or may or may not have been sworn in, but may come to the podium. If someone comes to the podium, I would ask them to do this.

Please pause and wait until I recognize you and I will probably ask whether you've been previously sworn and I will ask you to introduce yourselves and your position and then let you proceed. Just and that will hold true throughout the morning. With that, I think we'll proceed to our overview panel and for Duke and whoever. I'm not going to start first, Mr. Fallon or -- okay.

MR. FALLON: I'll start.

CHAIRMAN BURNS: Okay. Please proceed. Thank you.

MR. FALLON: Good morning, Commissioners. As I said, I'm Chris Fallon, Vice President of Nuclear Development for Duke Energy. We are here today to discuss the COL application for the William States Lee III Nuclear Station in Cherokee County, South Carolina. As was mentioned in the opening comments, we were just here two months ago for the Levy COL application, and so as such some of my opening remarks may be familiar.

However, we believe it is important to get this information into the record. Let me start by thanking the NRC, especially the NRC staff for its diligence in conducting a thorough review of our application. Likewise, I want to recognize the

members of our Duke Energy team who have worked tirelessly over the past several years to reach this point.

The work required to get to this mandatory hearing is very challenging, and we are very pleased to have the opportunity to discuss the Lee COL application with you.

Our presentation today will focus on the safety and environmental aspects that are unique to Lee, or those that have required evaluation beyond what you've reviewed in previous mandatory hearings. Let me tell you a little bit about Duke Energy. Duke Energy is one of the largest electric power holding companies in the United States.

Its six regulated utility operations serve approximately 7.4 million customers located on six states in the Southeast and Midwest, representing a population of approximately 24 million people. We have $121 billion in assets and a market capitalization of approximately $60 billion. The Lee plant, named after Bill Lee, a former Duke CEO and a pioneer in commercial nuclear power, is to be located in the Duke Energy Carolinas utility.

Duke Energy Carolinas serves over approximately 2.5 million customers in its 24,000

square mile service territory serving western and central North Carolina and western South Carolina. Duke Energy has the experience and skilled professionals and safely and efficiently operate nuclear plants.

Duke is one of the largest nuclear operators in the country, with 11 units at six sites located in the Carolinas. Duke Energy has successful experience in the construction of nuclear plants, and has been safety operating nuclear plants for over 45 years.

All told, Duke Energy has over 445 reactor years of operating experience. Our nuclear organization has over 6,600 highly trained nuclear professionals. Duke has achieved consistently high nuclear fleet performance. We have achieved 17 straight years with an average capacity -- an average fleet capacity factor greater than 90 percent and an excellent track record in the areas of personnel, nuclear plant and radiation safety.

Duke Energy Carolinas and its customers in the communities we serve have benefitted greatly from the Duke Energy Carolinas nuclear fleet. Duke Electric rates are 20 to 30 percent below regional and national averages. Much of this is attributed to

investment in nuclear in the 70's and 80's, and our excellent track record with respect to performance.

As such, the Lee COL is an important asset to Duke Energy Carolinas and our customers. We chose nuclear over other energy alternatives based on several considerations. First is cost. Duke Energy Carolinas has historically received approximately 50 percent of its energy from his nuclear plants.

Rates that are 20 to 30 percent below regional and national averages demonstrate the cost competitive of nuclear over its 40 design life. Second is need. Duke Energy Carolinas has a need for over 3,900 megawatts of new generation in the planning -- in our planning window.

Third, we also face increasing requirements to reduce greenhouse gases. Carbon-free nuclear generation is a critical component of plans to achieve further reductions in CO2 emissions.

So now to the AP1000. We selected the AP1000 as our design for a variety of reasons, chief among them being the passive safety features and our familiarity with the PWR technology. Duke Energy has over 365 reactor years of operating experience with the PWR technology.

Additionally, we found the AP1000's

passive safety features to be very attractive. The opportunity to collaborate with other utilities in the Southeast who also chose and/or constructing the same AP1000 design offers significant advantages, and we have benefitted from this collaboration.

We selected the Lee site after a comprehensive evaluation of alternative sites, followed by an extensive site characterization. The site has excellent margin to withstand external hazards, has been approved by the state and has been found to be the least environmentally damaging practical alternative by the Army Corps of Engineers.

Our final safety analysis report and the NRC's safety evaluation report document the thorough safety review that has been conducted and the plant's compliance with the Atomic Energy Act and NRC regulations. Likewise, our environmental report and the staff's final environmental impact statement document the thorough environmental review that has been conducted in compliance with NEPA.

Although we have not made a final decision to build, the ability to add emission-free nuclear generation in the Carolinas is an important element in our Integrated Resource Planning. Our Integrated Resource Plan, which is annually updated and filed

with the North Carolina Utilities Commission and the Public Service Commission of South Carolina, fully supports the need for baseload power.

The Duke Energy Carolinas Integrated Resource Plan shows a need for over 3,900 megawatts of generation in the 2017 to 2030 time frame, and the need for the Lee units in the 2025 to 2030 time frame depending upon the scenario. In addition to ongoing demand in energy growth, Duke Energy Carolinas recognizes the potential for unit retirements over the next 10 to 20 years.

These requirements will be driven by a combination of unit age and future regulation, particularly with implementation of future carbon constraints. This will create further need for new baseload generation that could be met by the Lee units.

In summary, Duke Energy believes it is well-positioned to construct, own and operate an additional nuclear plant. We have the financial strength and the operational experience to make the Lee project a success. Our staff of proven nuclear professionals will ensure safe, reliable, economic and environmentally sound operation of the Lee plant.

At this point, I'd like to introduce our

presenters for today's hearing. Bob Kitchen has been with Duke Energy for 35 years, with experience in plant operations, maintenance, engineering and major projects. He is responsible for Lee licensing.

John Thrasher has worked for Duke Energy for 38 years, with experience in design and plant engineering. He is responsible for engineering support for the Lee project. Paul Snead has worked for Duke for 36 years, with experience in radiation protection and the environmental support of plant operations. He is responsible for environmental support required for Lee licensing and permitting.

Larry Taylor has worked for Duke Energy for 31 years, and has significant experience as a PWR senior reactor operator and a shift technical advisor. Thank you very much for your time and attention. At this point I'd like to turn it over to Bob Kitchen to provide an overview of the Lee site and the licensing activities.

MR. KITCHEN: Good morning, Commissioners. I'd like to start with a description of Duke Energy Carolinas and a little bit about our energy profile. Also, just a brief description of the site, some of the characteristics there, some of the unique features, and we'll talk a bit about the activities

that we've done to prepare the site and some of the work we've done on site-specific design, a little bit about the organizational license itself and the exemptions that we've taken, and then Paul and I will highlight the safety and environmental issues of interest that we'll discuss later, in later panels.

Slides, please. The first slide shows the Duke Energy Carolinas service territory. Of course as Chris mentioned, Duke Energy Carolinas is a subsidiary of Duke Energy. The service territory that you see here covers western South Carolina and North Carolina. We currently have the three sites in the area that require Catawba and Oconee stations that are currently in service. We serve about two and a half million customers in the Carolina regions.

The Lee site that you can see there in red is pretty centrally located. It's actually in South Carolina as you mentioned, Cherokee County. It's about 40 miles southwest of Charlotte, and about 25 miles northeast of Spartanburg.

Next slide, please. Thank you. There you go. This shows our Duke Energy Carolinas capacity breakdown. You can see the various types of energy, renewables, hydro, coal, nuclear and natural gas. This shows the profile as projected in 2038, so this

is 2038. 2038 encompasses the period of time in which Oconee, which is a very large generating station, the license expires.

We are pursuing the second license renewal for Oconee. But you can see the impact here. This shows the profile with Lee and without Oconee being relicensed. If Oconee is relicensed, and we expect that it will be and certainly can be, that would change this profile to show nuclear at about 24 percent of our capacity.

So the need for Lee, as Chris outlined, there's a 3,900 megawatt generation need to fill, and also as you can see the profile with nuclear. With or without Oconee, Lee is a valuable asset to add here. We've got significant factors that affect the timing of Lee. No surprise. The historically low gas prices have affected our industry profoundly.

There's also, there's a lot of ambiguity in terms of the impact and timing of environmental regulations which would affect, you know, depending on what requirements are with regard to carbon release, and as I mentioned, the uncertainty around second license renewal.

We think it will be successful, but it's the first time so we've got some uncertainty there.

In our Integrated Resource Plan, if you've looked that it was recently issued for the Carolinas, it shows commercial operation in the first unit at Lee in 2026, followed by the second in 2028.

Given the uncertainties that I just described, that could drive the need for Lee earlier, and that's why in our application we show the '24 and '26 for Lee.

Next slide, please. The Lee site itself is actually formally selected as Cherokee nuclear site, which was a System 890 design plant that was started in the 70's and then ultimately cancelled in the early 1980's. The significance of that is we had -- for this site, we had a construction permit issued. We also had a Corps of Engineers 404 permit. We also had the MPDS permit issued, and an environmental impact statement, of course, to support those construction activities.

So as you can see, a lot of work was actually started. There was considerable grading that was done on the site. Roads were installed. We had reservoirs constructed on site and filled. We also had the area excavated for the powerhouse itself, for the System 80 design. So the site is a Brownfield site that is significantly disturbed because of the

previous construction activities.

We also have an advantage of this site in that we have an abundance of information off the site itself because of the explorations that we did to support Cherokee.

Next slide, please. Just to give you a little bit of insight on what the site itself looks like, this is actually -- I'll show you just a sequence here, you might say, before or after. The upper left is the actual Cherokee shield building, which this was taken before the site preparation activities, and you can see that -- I believe this is the turbine building framework on the right.

So we had go in and do quite a bit of work just to remove those structures above ground level of the site, and prepare the site for further investigation.

Next slide, please. We did do quite a bit of reclamation, reclaimed recycling. You can see that shield building, containment building coming down. That ultimately ended up being used for fill, about 80,000 cubic yards, and also we used it for bank stabilization around some of the reservoirs. So it shows a little bit what the site looks more like today. There was about more than 6,000 tons of steel

that we removed as well for recycling.

So next picture, next slide. This shows the site preparations for the Lee investigation itself. You can just see that the type of top soil that we have there and the preparations for the core borings, etcetera, that we did for Lee investigations.

Next slide. This shows the power plant area itself as drawn. You can see they're in very faint gray, the outline of the Cherokee footprint. The Unit 1 Lee nuclear island, the Lee units are shown in blue obviously. The Unit 1, which is on the left, is shown that it is entirely on top of the Cherokee foundation for Cherokee Unit 1.

You can see that Unit 2, these units are 800 feet apart. You can see Unit 2 right there and it's located on a hard rock surface area. That would have been the location for Cherokee Unit 3, but we didn't get that far.

We had quite a bit of mapping and geologic investigation that had been done for Cherokee, and we went through an effort to make sure that those records were correct and useful for Lee support, and that they were verified using ASME NQA-1 guidance on qualification of existing data.

The Lee mapping also confirmed that the

Cherokee final foundation as correct documented, correctly documented for Cherokee, and we also confirmed that the Cherokee foundation concrete meets the strength requirements specified for the AP1000 in the certified design.

Next slide, please. We're doing quite a bit of work to -- for the site itself, also for the design activities that supported site-specific work. We're about overall you'd say about 70 percent through that. A number of systems have been designed site-specific. You can see the list there of about seven systems or so that were designed, and we've taken the design really as far as we can, until we have actual equipment selection to proceed further with that design process.

Also, a lot of -- we worked with Westinghouse over the years in terms of site construction plans, to put together the approach and plans for the types of things you see on the right column there, schedule and infrastructure support at the site. We've also done quite a bit work, actually more in this area for I'd say commercial buildings, infrastructure, things like maintenance buildings, office buildings, etcetera, to plan for that.

So quite a bit of progress is made in

parallel with the licensing activities to be prepared to move forward with Lee.

Next slide, please. This is just a sketch of the Lee site itself, so you can kind of see the layout before I go to a map view. The site area is really most of this pictorial, the actual generating stations and immediate support systems like switchyard and cooling towers are shown in the brown, light brown area in the middle.

So you can see where we have the cooling towers located in the switchyard. We had two make-up ponds, Alpha and Bravo that were there, are there to support cooling of Lee, and the real source for the water source is the Broad River, and you can see it running across the top of that figure. It is a -- there is a reservoir created on the Broad River from the Ninety Nine Islands Dam, which is shown on the right side there.

Next slide, please. This is a map of a little bit larger area. The area we just looked at was the right center here, those two make-up ponds, Alpha and Bravo. That's the site itself, the tan area. About a 2,000 acre site for Lee and as we moved along, Paul will talk about this more extensively.

But we realized that with the severe

droughts that could occur, that we needed to add reservoir capability. So we've expanded, in fact did a supplemental submittal to expand, add another reservoir. Make-Up Pond Charlie you can see to the left there. That's about another 2,000 acre property that Duke has to the left there.

Next slide, please. The COLA itself, excuse me, the COLA itself is structured just as you've seen the others. DCD Revision 19 is incorporated by reference. Also, (inaudible) that you're seeing or was used that we jointly developed. It was used in Vogtle and V.C. Summer as reflected in the Lee application.

And then the exemptions that we have are shown here. The first two are really pretty routine. They're the standard the organization want to align the requirements for special nuclear material with the same requirements in Part 50. Then the AP1000 issues that we dealt with first on Levy. We discussed those at the hearing July 28th.

But you can see the same five issues are covered here in the Lee license, and in the same way the approach is identical for the issues that emerged that we dealt with on Levy and reflect in Lee.

Next slide, please. We're going to talk

about two things and just to highlight here the seismic, which we'll cover in the Safety Panel next, and the make-up. The evaluation for the Lee site, we had to go to a method that's addressed, described in the DCD, a little more detailed method rather than just a comparison of the envelope that's shown in the certified design.

We did that, and we'll talk through it in the next panel in detail how we did that and how we assessed that. But we looked at structures, major equipment, the piping systems and equipment qualification, and then going through the methodology, we confirm that the site does meet the requirements for the AP1000 certified design.

Next slide, please. Again, back to the map of our area but for a different purpose here. We have a request included in our application for a common Emergency Operations Facility or EOF. We use a common EOF for the Duke fleet today, the Duke Carolinas nuclear fleet.

So the EOF that's -- it's actually located in our corporate office in Charlotte, supports, Maguire, Catawba and Oconee stations today, and we've added Lee to that common EOF. To us, it makes sense. It's really we think a good approach. This EOF is

located more than 25 miles from the Lee site. So we will need Commission approval for that, for that location.

Because it's outside the 25 mile area, we also have an assembly area that's shown there. We'll talk a little bit more about that. But this is a specific request that's included in our application.

Next slide, please. The other thing we want to do, just in terms of full disclosure for the Commission, we have a fleet license amendment in process right now, it was submitted it a couple of months ago, that establishes the common EOF that I just described, the Emergency Operating Facility in Charlotte to support not only the Duke Energy Carolinas nuclear fleet but also the Duke Energy Progress nuclear fleet.

So we would be adding three sites with that license amendment, the Brunswick nuclear plant, the Harris nuclear plant outside of Raleigh and the H.B. Robinson plant. So I really just wanted to make sure the Commission's aware, we have that pending, and of course that's a separate license review. But you know, there is a tie there. Paul, next slide.

MR. SNEAD: For the environmental overview, I just wanted to point out that the

environmental report and the final environmental impact statement both concluded that there were small to moderate impacts for both construction and operation activities planned for this project, except for a large beneficial tax impact for Cherokee County.

The South Carolina Department of Health and Environmental Control issued the National Pollutant Discharge Elimination System operating permit in July of 2013.

The permit was important because it memorialized our water management plan for the site, which includes drought contingency, and we were, as part of that permit, received an alternate water withdrawal requirement that the Environmental Protection Agency concurred with.

South Carolina DHEC has also issued the 401 water quality certification in January of 2014, and the Army Corps of Engineers has issued the 404 permit for the site in September of 2015, and we'll discuss these more during the environmental panel. Bob.

MR. KITCHEN: Yeah. I guess just in summary, we've got we believe a good site selected for Lee. It's certainly centrally located and serves, will very well serve the area. Duke Energy Carolinas

has an advantage, in our opinion, of previously being selected as a site for nuclear generation, which not only from the standpoint of its acceptable, but also from the standpoint of maybe reducing environmental impacts a little bit.

Also, we've confirmed that the site is fully bounded by the AP1000 site parameter requirements. The emergent design issues that, as I said, have been discussed previously have been thoroughly reviewed and we feel those are resolved.

The environmental considerations, as Paul has just outlined, have been addressed and major permits have been issued. So that concludes our summary. We'll be glad to address questions.

CHAIRMAN BURNS: Okay, thank you. Thank you very much for the presentations and your testimony. I believe I'll start off with questioning on this panel. I have just I think two questions, and it goes to really in a context of the review in the light of that you are coming up, and I may have my numbers wrong.

So this is the fifth or sixth or the sixth and seventh or something like that AP1000s go into the system. I think it all depends on how you, whether you count sites or count actual units and all. But in

any event. You're further down. We have Vogtle and Summer; we have the Levy site.

So my question really is sort of any perspective you have on the design-centered review approach, whether it's working as originally envisioned and whether we're realizing efficiencies or do you have any perspectives you would want to share on how that's going in terms of -- in the context of this review.

MR. KITCHEN: Well, the design-centered review approach, I think, is an excellent approach. I mean it's -- we work together quite a bit with the other utilities in terms of we have the same problems. We're at different points in our projects, so obviously we have different focus and priorities.

But we certainly benefit, I think, from being able to work with the other utilities that are facing a similar challenge, and where we can to come up with a common approach I think benefits everybody, the applicant license as well as the staff in terms of review.

We've had, I think the biggest challenge area is and it's somewhat of a unique situation for us, in that we're closely following construction plans. There's a lot of detailed design work as you

would expect to support construction activities. How that -- how that is captured reflected in the application and the impact it could have on an applicant is a challenge.

I don't know how you avoid that, but that's been the biggest area. I think in terms of lessons learned for us, we have -- I think we're in a position where we certainly benefit by having the lead plants in front, being able to learn lessons from their experience and I would say right off it certainly reflects the importance of having, you know, design completion on roof construction. So that's a big benefit for us.

CHAIRMAN BURNS: Okay, and I guess a related thing. You may have touched -- I think you may have touched on it in some of your testimony. Again, you're following closely on the heels where you had I think this -- the closest we've had to these, to the mandatory hearings on the units.

But you know, let's say a little over two months ago on the Levy, on the Levy units, and I know there were -- and in that context, there were emergent design issues that were resolved during that. Are you able to translate those issues into the application here, or were there any need for plant-specific

modifications to those proposed Levy design changes for the Lee units?

MR. KITCHEN: No sir, and that's a clear example of the benefit of the approach you were just asking. The Levy had the lead, the opportunity to be first out and worked through those as the lead plant. We duplicated those results identically for the issues that we talked about, the five emergent issues in the Lee license application without change.

I can't speak for Florida Power and Light, but I believe Turkey Point will do the same.

CHAIRMAN BURNS: Yeah, okay. Thanks very much. That's all from me in this round. Commissioner Svinicki?

COMMISSIONER SVINICKI: Thank you all for your presentations. I'll just begin by noting one thing. I've heard a couple of references in your presentation to the Levy mandatory hearing that we conducted recently. I know we have a number of the same witnesses. I'm sure the same is true on the staff side.

I would just note as well we're -- this is a separate hearing record. So I know it's human nature to feel like you're repeating yourself, but I think, you know, it is best if this record, once it's

complete, stands alone. So please don't be shy about -- I guess this is an excuse to begin with, that I'm probably going to repeat myself today and ask about some of the same things.

So I'm doing it, thinking it's a good way to build a very strong record regarding this Lee mandatory hearing, so I wanted to begin with that. Then I did have a question to be certain that I understood your presentation. So the Integrated Resource Planning, it sounds like that's integrated also somewhat in your entire service territory in the Carolinas, because North and South Carolina have processes that are at least similar for that.

You do one integrated plan that's presented both state commissions; is that correct?

MR. KITCHEN: Well, the plan is Duke Energy Carolinas' plan for the South Carolina and separately there's a plan issued for North Carolina. So it's all separate.

MR. FALLON: Well, it's one plan and we issue it to both states. But we have a combined system that serves both customers in North Carolina and South Carolina and for Duke Energy Carolinas, and we plan that as one integrated system.

COMMISSIONER SVINICKI: Okay. So in that

integrated look, I thought that your presentation stated that there is at least one scenario under the integrated plan that would recommend that these Lee units, the first be in 2026 and the second in 2028. My question for clarification was is that being in operation in 2026 and 2028? That's not initiating construction.

MR. KITCHEN: That's correct. Those are the in-service dates.

COMMISSIONER SVINICKI: Okay. So would -- and I realize this is just one scenario in the Integrated Resource Plan, but I would remark that given the duration of construction that's actually not a terribly long time horizon if these licenses are issued between then and at least a scenario that would call for initiation of construction maybe within the next five to seven years or something like that; is that correct?

MR. KITCHEN: Yes, that's correct, and it is called for in what's call the base scenario. So that is the primary planning scenario that we are operating under in the Carolinas.

COMMISSIONER SVINICKI: Okay. So I would just reflect on the Chairman's statement, where I think for NRC perspective we're thinking of these in

the order in which licenses were considered in your case or issued already for some of the units. But it may well be that the integrated resource planning across the country would call for the units to either be constructed or not in entirely different time frames.

So I think that's interesting, and then I wasn't sure I understood your response to the Chairman's question about the fact that there is construction of AP1000s underway now. You indicated that you're following that closely, and I believe Mr. Kitchen you were referencing the fact that that construction necessitates very detailed design to support that construction.

So I was thinking that that would be a benefit to units that begin construction later. But then you went on to say that detailed design that's coming forward to support construction can really pose a challenge to applicants such as yourself. Is that because you have to go back and true up to that learning?

MR. KITCHEN: Yeah. It's really -- it certainly is a benefit for moving forward in construction, to the captured and learned lessons that the lead plants have, the impact it has as an

applicant.

Again, that's why I said that we're in a bit of a unique situation here, to need in some cases to go back and, as you mentioned, true up, to say here's an item that we need to address in our application that was identified in the construction plan. It has an impact primarily on schedule, to get through the license review process.

COMMISSIONER SVINICKI: Okay. Thank you for that clarification. My other question would be you referenced, and certainly in the record there's a very detailed discussion of the staff's analysis of any departures, which was not a terribly long list but you did take some departures from the AP1000 certified design Rev 19.

As you prepared your application and considered, I'm certain that there were other departures that you probably could have taken. But as an applicant, you wanted to approach that somewhat strategically. Can you give a sense? Did you have an overall philosophy of really minimizing departures or how did you evaluate whether or not to enshrine those departures in your application?

MR. KITCHEN: Well, we absolutely wanted to minimize departures to get through the license

review. We have -- first of all, we don't want to do a departure that's not needed. On the other hand, we want to -- we're going to obviously maintain the standardization. So the balance between that in the application space is what we're challenged with. But our objective was to minimize departures.

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

CHAIRMAN BURNS: Thank you. Commissioner Baran.

COMMISSIONER BARAN: Thanks for your presentations. Going back to timing for a minute, if NRC issues combined licenses for Lee, do you have a sense of when Duke would make a decision about whether or not to construct the units?

MR. FALLON: So our current plan calls for '26 and '28 if you assume a six year construction cycle. Now once you have the license, you're looking in the 2020 time frame potentially, if we stay on the, you know, the current assumptions. But I believe what Duke would like to do is learn lessons from V.C. Summer and Vogtle. So we are closely monitoring that construction and as we continue to learn those lessons, we'll refine when we would decide to move forward.

COMMISSIONER BARAN: Okay, and that was where -- I understood from Commissioner Svinicki's questions and the answers there about what the planning called for in terms of, you know, when they'd enter operation and then kind of working backward, to when you'd actually start construction.

I was trying to get at when you thought there would be a decision one way or the other to proceed, and I guess maybe to back into it a little bit, or to get at really where the issue, I'm curious about how long after you've made a decision would it be before construction began?

What's the kind of lag time between saying okay, we've decided we are actually going to construct eight of these units and construction actually begins occurring?

MR. FALLON: That would be on the order of a year to a year and a half because of the regulatory, the state regulatory filings that you would have to make and some of the other work that we were doing. And also we do not have an EPC contract to construct, so you'd have to build into that time to negotiate a contract and then go through your regulatory proceedings at the state level to get approval.

COMMISSIONER BARAN: Okay, and so

depending on how everything unfolds and you end up with the combined licenses, it may be -- you know, there may be a significant period of time there where you're a COL holder but you haven't begun construction yet. Of course until the ITAAC finding's made, there's no -- there's no time limit on the COL. So it could theoretically be a while.

During that period, you know, before you've decided to begin construction, begun construction, do you anticipate remaining active in the AP1000 Design Center? For example, you know, as issues arise at Vogtle and Summer, do you think you'd be submitting license amendment requests or are you going to hold off on that kind of activity until a decision's been made later on whether to construct?

MR. KITCHEN: Well, first of all absolutely we intend to remain involved in the AP1000 community. We want to move forward and begin incorporating the changes, and we'll use Vogtle as the model. We can pick V.C. Summer, but we used Vogtle as the model to incorporate the changes that they've done. We track those very closely. We have -- we are engaged with them in the review of those design changes and the impacts to the license in our plants, to start implementing those in the same sequence that

they did at Vogtle.

We're working right now actually internally and a bit with the staff to say what makes the most sense in terms of timing for submittal of those, in terms of resource availability and that sort of thing. But we absolutely do plan to move forward and update our license.

COMMISSIONER BARAN: And I know we'll discuss during the environmental panel more detail, site selection and those issues. But I wanted to ask at a high level about site selection. My understanding from the materials and the presentation so far is that the site selection process occurred prior to the severe drought in the 2007-2008 time frame; is that right?

MR. FALLON: Yes.

COMMISSIONER BARAN: But that really was -- better that really revealed the need for this Make-up Pond C, which I take is a pretty significant development. Did that cause you to go back and take another look at the site selection process?

MR. SNEAD: Yes Commissioner. We went back and considering the severe droughts looked at all of the alternative sites that we had considered, and placed the same criteria on them that we would on Lee.

We actually went so far as to evaluate if we need -- did we need an additional make-up water capacity drought contingency reservoir at those sites, and we determined we did.

We had to do high level design to understand what the impacts would be at those sites from the creation of those, and that was all part of our supplement to the ER in terms of the impacts at the alternative sites. The conclusion was still the same. The Lee site was the least environmentally impactful of all the alternative sites when you considered the need for additional drought contingency ponds.

COMMISSIONER BARAN: Okay, thank you.

CHAIRMAN BURNS: Thank you, Commissioners, and we'll ask now that the staff panel or first staff panel to come up for the overview. And as they get settled, again in this panel the staff will provide an overview, including their use of the design-centered review approach for the AP1000 combined license applications, and a summary of their regulatory findings.

Again, the panels, the witnesses have been put under oath and I remind them they remain so, and again I would advise that you can assume that the

Commission is familiar with the prehearing filings and again would ask the panels to introduce themselves. I'll start with you Frank.

MR. AKSTULEWICZ: Frank Akstulewicz. I'm the Director in the Division of New Reactor Licensing, the Office of New Reactors.

MS. ORDAZ: Vonna Ordaz. I'm the Deputy Director for the Office of New Reactors.

MR. LEE: Sam Lee, Acting Deputy Division Director for the Division of New Reactor Licensing in the Office of New Reactors.

CHAIRMAN BURNS: Okay. I'll -- the staff may proceed with its testimony and you Vonna?

MS. ORDAZ: Yes.

CHAIRMAN BURNS: Okay. Thanks, Vonna. Go ahead.

MS. ORDAZ: Good morning Chairman Burns and Commissioners. On behalf of the Lee review team, we are pleased to address the Commission at this mandatory hearing. With me on this panel, as we've already introduced, are Frank Akstulewicz, the Director of the Division of New Reactor Licensing, and Sam Lee, the Acting Deputy Director of the Division of New Reactor Licensing.

The team here today will present the

results of the staff's review of the application for the combined licenses or COLs for William States Lee III Nuclear Station Units 1 and 2, proposed to be located in Cherokee County, South Carolina. The staff's final environmental impact statement or EIS on this application was completed in 2013. The staff's final safety evaluation report or FSER was completed in early August of this year.

These documents are the culmination of an eight year review effort by the staff and represent the results of a coordinated effort of scientists, engineers, attorneys and administrative professionals from multiple offices within the agency, as well as the efforts of other agencies and those of our consultants.

Slide 2, please. On this panel, Mr. Akstulewicz and Mr. Lee will briefly describe the staff evaluation for the Lee COL application. This will consist of an overview of the safety and environmental reviews, as well as a summary of the staff's regulatory findings.

The staff completed its review of the COL application in August 2016. In February 2008, the staff docketed the initial version of the application. Since then, the staff has expended approximately

67,000 hours on the safety and environmental reviews. This effort has involved well over 100 engineers, scientists and technical specialists.

During this time, the staff had conducted approximately 60 public meetings and conference calls in support of the Lee application review. The applicant responded to approximately 950 staff questions, of which approximately 700 were associated with the safety review and 250 with the environmental review.

In addition, the staff considered over 1,300 comments on the draft environmental impact statement. Contractors working in collaboration with the staff devoted over 26,000 hours to support the environmental and safety reviews. The review of the application was a very thorough effort and focused on safety and protecting the environment.

Within the NRC, the offices that contributed to the review the Office of Nuclear Security and Incident Response, which looked at the emergency preparedness and security areas, the Office of Nuclear Reactor Regulation, which evaluated financial qualification aspects of the application, and the Office of Nuclear Material Safety and Safeguards, which supported the reviews for licenses

necessary under Part 30 for byproduct material, Part 40 for source material and Part 70 for special nuclear material.

The Office of the General Counsel reviewed the SER and EIS. Finally, the Advisory Committee on Reactor Safeguards reviewed and reported on the safety aspects of the Lee application in accordance with the regulatory requirements of 10 C.F.R. 52.87. In addition, the NRC Region II Office supported environmental meetings in the community near the Lee site.

The U.S. Army Corps of Engineers, Charleston District and the Department of Homeland Security also contributed to the NRC review.

Slide 3, please. On December 12th, 2007, representatives of Duke Energy Carolinas LLC delivered an application for COLs to construct and operate two AP1000 units in Cherokee County, South Carolina. Duke Energy Carolinas would be licensed to construct and operate the units if approved.

Slide 4, please. The Lee Units 1 and 2 COL application incorporates by reference the AP1000 design certification document, Revision 19, and Appendix D to 10 C.F.R. Part 52. The AP1000 design was certified by rule in 2011, and documented in NUREG

1793 and its supplements.

Based on the finality that NRC regulations afford to a certified design, the scope of the staff's COL technical review did not include items that were resolved within the scope of the certified design. Instead, the COL review focused on plant-specific aspects of the application that are the responsibility of the applicant, such as operational programs, site-specific design, COL information items and departures from the certified design.

As of now, the Lee COL application is one of only two remaining applications referencing the AP1000 design, currently under staff review. In addition, the Commission has previously issued licenses for two AP1000 COL applications covering four units currently under construction. That's Vogtle Units 3 and 4 and V.C. Summer Units 2 and 3.

The staff presented its review of the Levy Nuclear Plant Units 1 and 2 COL application to the Commission at a mandatory hearing on July 28th of this year.

Slide 5, please. In accordance with 10 C.F.R. 52.87, the Advisory Committee on Reactor Safeguards examined the staff's safety review of the Lee Units 1 and 2 COL application. The applicant and

staff supported one AP1000 Subcommittee meeting specifically related to the Lee COL application and its safety evaluation.

The staff presented the results of its review of the Lee COL application to the ACRS full committee in December 2015. Following the full committee meeting, the ACRS issued a report on December 14th, 2015, concluding that there is reasonable assurance that Lee Nuclear Station Units 1 and 2 can be built and operated without undue risk to the public health and safety.

The ACRS report recommended approval of the Lee COL application, following the approval of the five generic design changes, which affects standard content material for the AP1000. These design changes were reviewed by the ACRS full committee in April of 2016 under the docket for the Levy Nuclear Plant Units 1 and 2.

There were no Lee application specific recommendations for which the Committee sought specific staff action or response. The staff issued their final safety evaluation report on August 1st, 2016. This SER, the EIS and our statement in support of the hearing provide what the staff considers adequate basis for making the necessary regulatory

findings.

We look forward to responding to your questions at this hearing, and I would now like to turn the presentation over to Mr. Akstulewicz.

MR. AKSTULEWICZ: Thanks Vonna. Good morning Chairman and Commissioners. As you heard earlier, I am the Director of the Division of New Reactor Licensing in the Office of New Reactors. The staff prepared SECY 16-0094 dated August 8th, 2016 to support his mandatory hearing.

In that paper, the staff summarized the bases that would support the Commission's determination that the staff's review is adequate to support the findings set forth in both 10 C.F.R. 52.97 and 10 C.F.R. 51.107. That SECY paper provided an overview of the findings that support the issuance of COLs for Lee Units 1 and 2.

In order to issue a COL, the Commission must able to conclude that each of the following findings in 10 C.F.R. 52.97 is met, that will summarize the staff's bases supporting each finding. First, the applicable standards and requirements of the Atomic Energy Act and the Commission's regulations have been met.

The staff reviewed and evaluated the

application against the applicable criteria in 10 C.F.R. Based on the staff's review, as documented in the final safety evaluation report and the final environmental impact statement, the staff concludes that 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 notifications to other agencies or bodies have been duly made. As documented in the SECY paper, all required notifications such as to the Public Service Commission of South Carolina and the North Carolina Utilities Commission, as well as the required *Federal Register* notifications have been made.

Slide 7, please. Third, there is reasonable assurance that the facility will be constructed and will operate in conformity with the license, the provisions of the Atomic Energy Act and the Commission's regulations. As the SECY paper states, the staff believes that its review, as documented in the FSER and the final EIS, the inspections, tests and analyses and acceptable criteria or ITAAC and the license conditions provide the necessary assurance that the unit will be constructed and operated as required.

Fourth, the applicant is technically and financially qualified to engage in the activities authorized. The technical and financial qualifications of the applicant are summarized in the SECY paper and documented in detail in Chapters 1, 13, 17 of the final safety evaluation report.

Slide 8, please. Fifth, the issuance of the COL will not be inimical to the common defense and the security or the public health and safety. The specific bases for these findings have been provided in the staff's SECY paper. Sixth, the findings required by Subpart A of 10 C.F.R. Part 51 have been duly made.

The staff's conclusions supporting the findings required by Subpart A that will be presented by Sam Lee, who will now provide an overview of the staff's environmental review.

MR. LEE: Thank you and good morning, Chairman Burns and Commissioners. As Vonna indicated earlier, I am the Acting Deputy Director of the Division of New Reactor Licensing in the Office of New Reactors.

I will be discussing the environmental review and will provide an overview of the process we used in conducting this review, the draft summary

record of decision and the staff's recommendation as a result of the review.

I will also discuss the regulatory findings that need to be made before licenses can be granted.

Slide 9, please. The staff prepared an Environmental Impact Statement or EIS for Lee Units 1 and 2 COL application in accordance with National Environmental Policy Act of 1969 and the requirements of 10 C.F.R. 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 information gathered through consultations with other agencies.

The U.S. Army Corps of Engineers fully participated with these staff as a cooperating agency in preparing the Lee EIS under the terms of an updated Memorandum of Understanding between the NRC and the Corps for the review of nuclear power plant applications.

As a member of the environmental review team, the Corps staff participated in site visits, consultations with other agencies and development of the draft EIS and final EIS.

Slide 10, please. The NRC began the

environmental review process for the Lee COL application by publishing a Notice of Intent to Prepare an EIS and Conduct Scoping in the *Federal Register* on March 14, 2008. Two scoping meetings were held to obtain public input on the scope of the environmental review in Gaffney, South Carolina on May 1, 2008.

The staff reviewed the comments received during the scoping process and responses were developed for each comment. These responses are documented in a scoping summary report and are also provided in Appendix D of the final EIS.

The staff contacted federal, state, regional and local agency and federally recognized Indian tribes during the scoping period to solicit comments, and these comments were considered in preparing the draft EIS.

Specifically, the staff consulted with the U.S. Fish and Wildlife Service, National Marine Fisheries Services, federally recognized Indian tribes, the South Carolina State Historic Preservation Office and other agencies as required by the Endangered Species Act, National Historic Preservation Act and other statutes.

Slide 11, please. The draft EIS was

issued in December 2011. A 75-day comment period for the draft EIS began on December 12th, 2011, the date of the publication of the U.S. Environmental Protection Agency Notice of Availability. The staff held two public meetings on January 19, 2012 in Gaffney, South Carolina to describe the results of the staff's environmental review, to 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.

Slide 12, please. On December 20, 2013, the staff published the final EIS as NUREG-2111. As stated in the final EIS, the staff's recommendation related to the environmental aspects of the proposed action, is that the COL should be issued.

The staff based its recommendation on (1) the Lee COL application environmental report; (2) consultation with federal, state, tribal and local agencies; (3) the staff's own independent review; (4) the staff's consideration of comments that were received during the public scoping process; (5) the staff's considerations of comments on the draft EIS;

and (6) the assessment summarized in the EIS, including the potential mitigation measures identified in an environmental report and in the EIS.

Slide 13, please. The staff concluded a draft summary record of decision as a reference in the SECY paper. This document states the decision being made and identifies all alternatives considered in reaching the decision.

The draft summary record of decision also discusses preferences among the alternatives and states whether the Commission has taken all practicable measures within its jurisdiction to avoid or minimize environmental harm from the alternatives selected, from the alternatives selected.

Slide 14, please. This slide lists the environmental findings pursuant to 10 C.F.R. 51.103(a), that the Commission must make to support the issuance of the Lee Units 1 and 2 COLs. The staff believes that the scope of the environmental review, the methods used to conduct the review, and the conclusion reached in the EIS are sufficient to support a positive determination regarding these findings.

For the first finding, in accordance with NEPA Section 102(2), 2(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 the environmental sciences. The staff's review also comports with the NRC's requirements in Subpart A of 10 C.F.R. Part 51.

The staff concludes that the environmental findings in the EIS constitutes the hard look required by NEPA and have reasonable support in logic and fact. In accordance with NEPA Section 102(2)(c), the EIS for the Lee COL addresses (1) the environmental impact of the proposed action; (2) any unavoidable adverse environmental effects; (3) alternatives to the proposed action; (4) the relationship between local, short-term uses of the environment and the maintenance and enhancement of long-term productivity; and (5) any irreversible or irretrievable commitments of resources that would be involved in the proposed action should it be implemented.

As supported by the correspondence presented in Appendix F to the EIS, the staff concludes that the requirement of NEPA Section 102(2)(c) was fulfilled by consulting with and obtaining comments from other federal agencies with jurisdiction by law or a special expertise. As noted

earlier, the U.S. Army Corps of Engineers fully participated with the NRC as a cooperating agency in preparing the EIS. The staff did not identify any other federal agencies as cooperating agencies in preparing this EIS.

In accordance with NEPA Section 102(2)(e), the staff concludes that the EIS demonstrates that 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 mitigation alternatives for severe accidents.

Slide 15, please. For the second and third findings which appear on this slide and the next, Chapter 10 of the EIS provides the staff's cost-benefit assessment, which considered conflicting factors such as the need for power, as well as reasonable alternatives to the proposed action.

Slide 16, please. Based on that analysis, the staff concluded that the construction and operation of the proposed Lee Units 1 and 2 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.

Slide 17, please. For the fourth finding, the staff believes that the Commission will be able to find after this hearing that the NEPA review performed by the staff has been adequate. 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 request for COLs. I will now turn over the presentation back to Vonna.

MS. ORDAZ: Okay. Thank you, Sam. Slide 18, please. During this hearing, the staff will be presenting information on the issues listed on this slide. The safety and environmental panels will discuss unique facility features and novel issues that arose as part of the review process.

Specifically, the safety panel will cover two topics. The first is site foundation response spectra and the second is the Emergency Operations Facility. The environmental panel will discuss the proposed creation of Make-Up Pond C. This concludes the staff's opening remarks. We are prepared to respond to any questions that you may have. Thank you.

CHAIRMAN BURNS: All right, thank you. Commissioner Svinicki.

COMMISSIONER SVINICKI: Thank you for your presentations and Vonna, I want to begin by thanking you for the high level summary you gave of the staff's -- the entirety of the staff's efforts in terms of reviewing the application and leading up to where we are today. It's always impressive to me when I'm reminded of the number of staff hours, some technical contract support that we utilize principally on the environmental side.

In September, our Commission always holds an all employee meeting and this year, as Commissioners, we responded to a question about, you know, couldn't the Commission figure out specifically which staff witnesses might have to respond to questions, so that they wouldn't have to be present for this hearing.

But I think if for no other purpose, whether or not they get called to the microphone, I want to say to all of them that are here today, it is a moment to hear this engagement between the applicant, the staff witnesses and the Commission, and really reflect on what for many of you has been a multi-year effort, a good part of your days and nights and hours of your lives and I think it's an impressive effort.

So I hope that whether or not they get the excitement of coming to the microphone, I hope that they can just have some time to reflect upon this, maybe take in areas of the review that they themselves didn't work on, or just kind of soak in the moment because I think that the levels of professionalism and expertise that have been brought to this is something that we all should be very proud of.

So I just wanted to offer that comment. It makes me feel like I should call a lot of people to the microphone, because I know that they're feeling a little bit bored. With this overview panel, I do want to explore one issue. I've picked the overview panel, because Vonna and Frank I think it may be something of a higher level that you guys need to respond to.

I'm going to refer to your pre-filed testimony, which is the SECY paper that Frank referred to. Because this is not a de novo review, the staff is asked to identify in its pre-filed testimony areas of Commission interest and you've done that in this paper.

One of those areas that you've identified is severe accident management guidelines, and I'm going to in a tedious way quote to you a little bit from your own pre-filed testimony, that it says "The

staff identified an area of interest related to a recent Commission decision about the draft rule on mitigation of beyond design basis events. In the draft rule, the staff proposed to require implementation of severe accident management guidelines, also known as SAMGs.

"In the associated staff requirements memorandum, the Commission approved publication of the draft rule for public comment, subject to the removal of the proposed requirement for SAMGs."

The staff goes on to write "SAMGs are an industry initiative and remain voluntary for most licensees. However, the AP1000 design certification rule incorporates the AP1000 DCD, which specifies implementing the AP1000 severe accident management guidance on a site-specific basis.

"This is a condition of license for current AP1000 COLs, which is Vogtle and Summer. For consistency within the AP1000 Design Center, one of the proposed license conditions for Lee units would be the implementation of site-specific SAMGs."

Now we recently conducted the Levy mandatory hearing and I did a brief comparison between the staff's pre-filed testimony in Levy and there was nearly identical identification and discussion of this

issue. However, in Levy the staff went on to say "The staff is monitoring the development of the mitigation of beyond design basis events rule, and will be prepared to make conforming licensing adjustments as appropriate."

My question is does the difference in the text of these two somewhat contemporary pre-filed hearing statements indicate that the staff does not or would not monitor the development of that final rule and be prepared to make conforming licensing adjustments in Lee?

MR. AKSTULEWICZ: No. I think Commissioner the staff is clearly monitoring what's going on with respect to the final rule, and whatever the adjustments are that we need to make will be made across the Design Center as a whole. The fact that we didn't include that language in the SECY paper is merely an oversight.

COMMISSIONER SVINICKI: Okay. So it may have been for brevity and did not indicate that the staff would have a differing approach?

MR. AKSTULEWICZ: That's correct.

COMMISSIONER SVINICKI: Okay, thank you. It raises the question in my mind a little bit, and this is why I think I have a higher level area of

interest I'll call it, that is very informative for me, because I just developed it when I was preparing for this mandatory hearing today. But it has to do with the somewhat static nature of the design certification rules, and it's much broader than SAMGs.

Actually, I think we've touched on an analogous issue with the applicant that we just had. But it has to do with the fact that even though Part 52 is not young in the strictest sense, as an agency and for the nuclear industry, we really are still just engaging our first kind of operating experience with certain elements of Part 52.

I think these durations between perhaps initiation of construction, approval of design certification rules, issuance of licenses that reference those design certification rules, I used the term "truing up" with the applicant. But in my mind, there is a need for regulatory coherency when we, as we will always do, look at things like the mitigation rule that is underway right now for operating reactors.

Right now, the staff I think does some sort of high level assessment if we're looking at something in Part 50, and we might make a change on something. Does that require any conforming changes

over in Part 52? What I'm not aware of us doing systematically is looking at any shadows that are cast over into the design certification rules themselves, and then as those have manifested in these license conditions, either for reactors that are being constructed, for some that are contemplating licenses have been issued but the reactors might not be constructed for a long time.

I think there will be a forward-going obligation on the technical staff to be certain that all of those things are kept in true or coherency with each other. So I appreciate that, as is evident here that you highlighted the SAMG issue, I actually think it's emblematic of something that's going to be kind of complex for us going forward.

I would offer Vonna or Frank just a chance to kind of react to that and say yeah, it's a thing, you know, that we know that the agency and even our successors years from now are going to have to be keeping their eye on.

MR. AKSTULEWICZ: Okay. So I'll try to jump in there. You raise a very interesting point, and I think, from a process standpoint, we don't have procedures that say that is exactly what we should do. All right. I think from a practical standpoint, it is

exactly what we do. We have in the process a regulatory issue summary that is outlining those matters that are sensitive with respect to the design certification and are preparing a record for what will be necessary for renewal, as the AP1000 considers coming in in the 2019 time frame, in terms of those matters that would have to be addressed as part of the renewal application.

And so we do keep in mind the impacts on the certification roles that are playing out across the Commission, whether it be in the Office of Reactors or whether it be NSIR or NMSS, as the governing regulations are evolving. So there is that ad hoc process, but it's not a formalized one.

COMMISSIONER SVINICKI: It may be. I appreciate that answer, Frank, and I think it may be something that when perhaps we're not as busy with some of the work that's going on right now, leading up maybe to some additional mandatory hearings next year, it may be a really interesting endeavor to get some sort of NRC working group together and maybe engage with the design centers for the various things.

And I don't mean to indicate that I'm not mindful of the whole structure of having design certification approval take the form of a rule. The

finality and reliance that that brings is a real strength of the structure. But, again, I think, in terms of the overall defensibility of the coherency of the regulatory framework over the coming years, as we have new learnings on the operating reactor side, we continually look at whether or not changes to our regulatory framework are called for.

We're going to have these, I'll call them pieces hanging out. Even if there's somewhat of a pause in new reactor construction in the United States, there's going to be a need to continue to keep all of these things having fidelity with each other, I think, at some level. And, Frank, I acknowledge that it's more philosophical. It's something that we would need to do to have defensibility to our regulatory framework, as the Chairman refers to it as the regulatory craft. It has a little bit more to do with that than any particular directive or instruction we have right now. But I do think it will be a challenge for us going forward, so I appreciate your acknowledgment of that.

And, Mr. Chairman, I'll yield back.

MS. ORDAZ: Informally, we also have day-to-day interactions between the operating reactors and the new reactor business line with all of our

partners, NRR, research, Region II, NSIR, and a lot of great dialogue back and forth with all the centers of expertise. So there is a continuous daily interaction to learn on both sides.

COMMISSIONER SVINICKI: And, again, you know, I guess I'll just respond to that by saying SAMGs were a great way to kind of lubricate thinking on this because of the fact that, as the staff highlighted so earnestly here, the Commission looked at, you know, proposed language regarding this and made an affirmative decision. When I was deliberating that proposed rule, I wasn't thinking a whole lot about these kinds of issues, but I think it's something that is going to become increasingly important. When we're all thinking this is a requirement of today, we're going to have to think about the implications for these reactors either under construction or perhaps having decisions made to initiate construction in just the next few years. Thank you.

CHAIRMAN BURNS: Thank you, Commissioner. Commissioner Baran?

COMMISSIONER BARAN: Thanks for, thanks for the overview presentations. As has already been noted, this is the fourth combined license review of

an AP1000 site, and, Frank, I think you've been involved in all of them.

MR. AKSTULEWICZ: Yes, I have.

COMMISSIONER BARAN: When I look at the uncontested hearings at least, I see them getting more and more efficient and focused each time we consider another combined license of the same certified design. What are you seeing in the NRC staff reviews more generally? Are you finding that your review process for subsequent combined license applications is more efficient and streamlined than for earlier applications of the same design?

MR. AKSTULEWICZ: The answer -- well, first of all, thank you for the fact the, your observation that they're becoming more efficient. The answer to your question is, yes, they are. We're seeing a much more refined approach in terms of the issues that are truly involved in the review to be very site specific, more related to the characteristics and interaction between the design and the site itself.

I think you're seeing that in terms of the progression we had recently, the hearing for Levy. We have this hearing now. Turkey Point will be right behind it requesting the hearing in mid November. So

you can see the pace at which these issues are resolving because of the common nature, the ability to incorporate by reference the use of standard language, the closure of one issue leading to the closure of issues on all those particular applications. So we are seeing efficiencies in that respect.

COMMISSIONER BARAN: If the combined licenses are issued for Lee, NRC will need some time to get construction resident inspectors in place and to prepare other construction inspectors prior to the commencement of construction. If Duke receives the COLs for Lee and decides to build the Lee units, and maybe this is a question for Vonna, how much notice would the staff need to prepare for the start of construction?

MS. ORDAZ: Well, I would just offer that preparation, planning ahead is a big part of what we do, and you'll hear further later this month at our business line briefing, Region II will be speaking and there's preparation underway now to think toward what's coming down the pike. But, Frank, may add.

MR. AKSTULEWICZ: So it's a great question, Commissioner. Our budget cycle is two years out, so you would think that we would need about two years to have the resources in place and budgeted for

those activities to manifest themselves at the site specifically. But what I want to also mention is we have in place annual communications with the utility, and we're just in the process of completing what we call our business plan discussions where we talk to the utility specifically about that to ask the very questions that you were asking of the applicant earlier in the overview with them about when are your decisions going to be made, what are the factors that are going to play into that, you know, the time lines for those things, so that we are already looking out well into the future to try to anticipate for budgeting purposes when that might occur and then have it confirmed as part of our regular interaction process.

COMMISSIONER BARAN: Thank you.

CHAIRMAN BURNS: Oh, thanks, Commissioner. There are a couple of things I have. I'm going to pose to you the question I posed to the applicant, which is with respect to how you think the design-centered review approach is working, is it working as we envisioned it, or do you think we're realizing efficiencies that we expected when the approach was considered, was conceived and begun implementation?

MS. ORDAZ: And the answer is yes. The

design-centered review approach has been working, Frank will elaborate on that, with the five generic issues identified previously on the Levy docket, as well, that's helped with the efficiencies. The whole concept of one issue, one review, one solution, that mind set has helped with the staff's review. Frank, would you like to add?

MR. AKSTULEWICZ: I agree with Vonna. I think the challenge that Mr. Kitchen referred to in his discussion was when issues are identified that challenge the underlying findings for the design certification, which inhibits the staff from moving forward with saying that all the necessary regulations have been satisfied or that there's reasonable assurance, those are the challenges where construction leads to potentially additional design changes that lead to questions about certification and the findings made there.

But, overall, the design center approach is reaping the benefits of what was intended when it was originally started. The only unfortunate part is we've seen that delayed in terms of its application or implementation because of these issues that are associated with the certification itself.

CHAIRMAN BURNS: Okay, all right. Well,

let me turn it to a subject that Commissioner Baran touched on, and that's, I think, the question of whether the reviews, there's a certain efficiency in the reviews and all that, but let me focus on, you know, Vonna gave some statistics. For example, there are 950 questions put to the applicant, about a quarter of which dealt with environmental issues, so about 700 on the safety issues. Can you give me an idea, and I'm not saying give me an exact count, but what were the particular areas of focus, like from a larger perspective or overall perspective, that those questions focus on?

MR. AKSTULEWICZ: Okay. So going back to what I said originally that a lot of the reviews are now shaped by the site characteristics, so many of the questions, and you'll hear it come out in the safety panel later, about the seismic nature of this particular site. It's unique. There were exceedances to the DCD criteria. So a lot of the questions were associated with the development of the site-specific acceptance criteria, the analyses that were done to support the conclusions that the site was or the equipment for the facility that was bounded to buildings was going to be okay, those types of things are where a lot of the questions are shaped.

You also get questions associated with maybe some of the specific implementation of the systems themselves that are discussed in some limited detail in the certification, but the staff is probing whether additional detail is available with respect to the evolution of the application.

CHAIRMAN BURNS: Okay. And the environmental area, what would you say those 250 questions, what were the primary focal points?

MR. LEE: I'm going to have to defer that to the staff on the primary focus. But, you know, when we did the initial scoping and when we received feedback on the draft Environmental Impact Statement, obviously the concerns from the public were in the area of water consumption, water usage, and so forth. And so in response to that, we took additional measures to look into that concern or address those concerns. But the questions that we asked is wide-ranging across the board and all of the resources aspects that we consider in the impact.

CHAIRMAN BURNS: And you mentioned the 1300 comments from the public. Again, are some of these, they're either what I'll call repeat, not repeat questions -- I've been in the position as a staff counsel where I basically have 500 cards that

are essentially signed, you know, postcards that are signed that raise a particular issue, which is, you know, perfectly legitimate. What I'm trying to understand is is that a phenomenon you had here in terms of the comments that are placed on it, or is it, again, from the public comments, particular themes or, you know, differentiated from one another?

MR. AKSTULEWICZ: I think the answer is we did not see the phenomenon where we had the traditional or a systematic use of a postcard type of assessment supporting one position on this particular application. So the questions that we got were broad-reaching and they focused on, you know, the new pond. They focused on alternative sites. They focused on the water usage with respect to how you're going to provide cooling to the facility, some of the permits that the Army Corps had the issue. The incorporating agency were also part of the discussion.

CHAIRMAN BURNS: Okay. And the final question again, we may touch on this more during the environmental presentation, in the record of decision the staff notes that the document contains a statement that the NRC has taken all practicable measures within its jurisdiction to avoid or minimize environmental harm from the alternative selected. Can you describe

for me in terms of what does the term practicable mean and how do you apply it in this context?

MR. AKSTULEWICZ: I'll try. Okay. So practicable means, includes, I shouldn't say means but includes such things as potential mitigation. It includes conditions that would be placed on permits by other agencies, like the Corps, the Forest Service, or incorporating best practices with respect to resource, management, those particular activities. That's what the staff is inferring by the term as, you know, practicable.

CHAIRMAN BURNS: Okay. And I presume then you'll highlight later in terms of what some of those were in --

MR. AKSTULEWICZ: I think the environmental panel would be more than happy to elaborate on that.

CHAIRMAN BURNS: Okay, all right. Thanks very much. Okay. We've come to the end of our first panel, and, at this point, we're going to take a break, I think about, well, let's say why don't we take about a ten-minute break? And then we'll reconvene close to a quarter of 11. Thanks.

(Whereupon, the foregoing matter went off the record at 10:30 a.m. and went back on the record

at 10:44 a.m.)

CHAIRMAN BURNS: All right. We'll call the hearing back to order. We're going to focus in this next section, session on the safety aspects of the application. The parties will address relevant sections of the application in two chapters in particular from the final safety evaluation report, Chapter 3, referring to design of structures, components, equipment, and systems, and Chapter 13, conduct of operations.

I'm going to remind the witnesses you all remain under oath, and I also advise you that you should assume that the Commission is familiar with the pre-hearing filings. And, again, as I announced at the beginning of the hearing, we'll have both this applicant's panel and then the staff panel testify and then proceed to Commission questions.

So we'll begin with the applicant panel, and, again, I want to ask you to introduce yourselves and then you may proceed.

MR. TAYLOR: Larry Taylor. I'm with Duke Energy, nuclear development.

MR. KITCHEN: Bob Kitchen, Duke Energy, nuclear development.

MR. THRASHER: John Thrasher, Duke Energy,

nuclear development.

CHAIRMAN BURNS: Okay. You may proceed.

MR. THRASHER: Good morning, Mr. Chairman and Commissioners. I'm John Thrasher, Director of Engineering and Nuclear Development at Duke Energy. I'm going to provide an overview of the seismic evaluation performed for the Lee site that concludes the site is suitable for deployment of the AP1000 standard plant. I'll also cover Duke Energy's request for an exception regarding the location of the Emergency Operations Facility, or EOF.

Next slide, please. First, the seismic design basis for the AP1000 standard plant is a Certified Seismic Design Response Spectra, or CSDRS. The AP1000 standard plant design for the CSDRS has also been qualified for the Hard Rock High Frequency Spectra, or HRHF Spectra, which was developed to address high-frequency spectra exceedances for hard rock sites in the Southeastern United States.

The AP1000 design control document allows qualification of a site where the site spectra exceeds the CSDRS by either of two approaches: first, comparison of the site spectra to the HRHF spectra or, secondly, use of the same evaluation methodology used to qualify the AP1000 standard plant for the Hard Rock

High Frequency Spectra. Lee Nuclear Station is a uniform hard rock site and utilizes the evaluation methodology to qualify the site.

The Lee site horizontal spectrum is shown by the blue line on this figure. Lee site spectra were developed using the updated Central Eastern United States Seismic Source Characterization issued in 2012 as NUREG-2115. It also used the updated EPRI 2013 Ground-Motion Model. The AP1000 CSDRS is shown by the red line on this figure. The CSDRS is a robust design spectra that is rich in energy in the frequency ranges of 1 to 10 hertz where structures, piping, and major equipment naturally respond. This frequency range is shaded in red in the figure.

High displacements in this low-frequency range lead to high building and equipment forces and moments. The AP1000 standard plant is designed for the CSDRS which ensures a rugged, robust plant design configuration.

The Lee site spectra are similar in shape to the AP1000 Hard Rock High Frequency Spectra but exceed that spectra. As shown by the blue line on this figure, the Lee site horizontal spectrum is significantly lower than the CSDRS spectra in the frequency ranges of 1 to 10 hertz where structures,

piping, and major equipment respond. The Lee site spectra exceed the CSDRS only in the high-frequency range where low displacements lead to small non-damaging building and equipment forces and moments. The high-frequency range is shaded in blue in this figure.

Next slide, please. The AP1000 design control document allows use of the same evaluation methodology used to qualify the AP1000 standard plant for the HRHF spectra for qualifying a site where the spectra exceeds the CSDRS. The Lee combined license application is a site-specific implementation of this evaluation methodology. Analysis confirmed that the CSDRS controls design forces and moments for structures and major equipment, typically bounding site-specific spectra results with significant margin. CSDRS and HRHF piping stresses envelope the Lee site-specific spectra piping stresses. Test Response Spectra used to qualify AP1000 high-frequency sensitive equipment bound the required response spectra for the Lee site-specific equipment qualification.

In conclusion, the high-frequency seismic input for the Lee site is non-damaging and the Lee site is qualified for deployment of the AP1000

standard plant.

Duke Energy is requesting an exception for the location of the EOF to use the common EOF in Charlotte, North Carolina, which currently supports Catawba, McGuire, and Oconee Nuclear Stations. The common EOF is approximately 40 miles from the Lee site. The near site assembly area is provided approximately 15 miles from the Lee site at a Duke Energy training facility in Kings Mountain, North Carolina if needed by NRC or other emergency responders.

The common EOF has supported multi-site drill and exercises. The Lee combined license application includes a proposed license condition to perform a similar multi-site drill and exercise that would include the Lee site and one additional nuclear site prior to fuel load.

Next slide. This map of the Duke Energy Carolina service territory was shown in the overview presentation earlier today. Again, the common EOF in Charlotte is approximately 40 miles from the Lee site, and the near site assembly area in Kings Mountain is approximately 15 miles from the Lee site.

Next slide, please. This concludes our safety panel presentation. Thank you.

CHAIRMAN BURNS: Thank you. And I'll ask the staff to move up. Again, I'll ask you to identify yourselves for the record, and I'll start with Mr. Thomas.

MR. THOMAS: Hi, I'm Kenneth Thomas, an Emergency Preparedness Specialist in the Division of Preparedness Response in the Office of Nuclear Security and Incident Response.

MR. HUGHES: I am Brian Hughes, Senior Project Manager, Division of New Reactor Licensing in the Office of New Reactors.

MR. ROCHE-RIVERA: I am Robert Roche-Rivera. I'm a Structural Engineer in the Division of Engineering, Infrastructure and Advanced Reactors, in the Office of New Reactors.

CHAIRMAN BURNS: Okay. You may proceed. I'm not sure. Are you going to start, Mr. Hughes? Okay, thanks.

MR. HUGHES: Good morning, Chairman Burns and Commissioners. My name is Brian Hughes, and I am the lead Project Manager for the staff review of the William States Lee III Nuclear Station, Units 1 and 2, combined license application.

Slide two, please. Joining me on this panel are Mr. Robert Roche-Rivera and Mr. Kenneth

Thomas.

Slide three, please. The staff's presentation for this panel will discuss two unique site-specific topics of the safety review. The two topics in order are: first, the Lee Site Foundation Response Spectra and, second, the Emergency Operations Facility.

I will now turn over our presentation to Robert Roche-Rivera, who will address the topic of the Site Foundation Response Spectra at the Lee site.

MR. ROCHE-RIVERA: Thank you, Brian. As indicated moments ago, my name is Robert Roche-Rivera. I am a Structural Engineer in the Office of New Reactors. I was the lead reviewer for the structural engineering aspects of the Lee COL application. On the following slides, I'll present to you the staff's review of the seismic design and analysis issues and respective resolution for the Lee application.

In addition to structures, the presentation addresses primary components, piping systems, and electronic and electrical equipment. We have staff in the audience for responding to questions related to such system and components, as necessary.

Slide five, please. In accordance with the AP1000 DCD, to assess the adequacy of the AP1000

standard design for a particular site, a COL applicant compares the site-specific response spectra, which, for Lee, is representing the figure on the slide by the green curve to the AP1000 Certified Seismic Design Response Spectra, or CSDRS, shown in the figure by the dashed blue line.

The seismic design of the AP1000 standard plan is based on the CSDRS. In addition to the CSDRS, the AP1000 DCD includes a Hard Rock High Frequency Spectra, or HRHF, shown in the figure by the dashed orange line. The HRHF spectra are included in the AP1000 DCD as an alternative set of spectra to assess the adequacy of the AP1000 standard design for sites with site-specific response spectra exceeding Hard Rock High Frequency characteristics.

Additionally, the AP1000 included an HRHF seismic evaluation which demonstrated that the HRHF input is non-damaging to the AP1000 design. However, as shown in the figure, the Lee Site Foundation Response Spectra exceeds both the CSDRS and the HRHF spectra in the high-frequency range.

Slide six, please. Due to the exceedance, the applicant needed to request a departure from AP1000 certified design, namely the Lee Departure 2.0-1. Furthermore, in accordance with the AP1000 DCD,

the high-frequency spectra exceedances required site-specific seismic evaluations.

Slide seven, please. Consistent with the AP1000 DCD, Lee performed a site-specific seismic evaluation to demonstrate that a high-frequence exceedance is non-damaging. As a first step of this site evaluation, the site In-Structure Response Spectra, or ISRS, were compared with the corresponding CSDRS and HRHF ISRS at locations defined in the AP1000 DCD. This comparison showed small ISRS exceedances in the high-frequency range.

Slide eight, please. In accordance with the AP1000 DCD, the ISRS exceedances required additional more detailed evaluation of nuclear island seismic category one and adjacent seismic category two structures' primary components by consistence and electromechanical equipment. This evaluation included dynamic analysis of structures, primary components, and piping systems, and the review of equipment test information for representative high-frequency sensitive equipment.

Slide nine, please. From the site-specific dynamic analysis, the applicant obtained forces, stresses, and relative displacements induced by the Site Foundation Response Spectra and compared

them with the corresponding AP1000 forces and stresses and relative displacement requirements for nuclear island and adjacent structures' interaction.

Staff reviewed these comparisons and found them to demonstrate that the site-specific forces on nuclear island seismic category one structures are bounded by AP1000 forces, and the relative displacements between nuclear island and adjacent structures are much smaller than the minimum required separation between them. And, therefore, there's no physical interaction between these structures.

Slide ten, please. Also, the comparisons demonstrated that site-specific forces and stresses on primary components and piping systems are bounded by AP1000 forces and stresses respectively.

Slide 11, please. In addition to the site-specific dynamic analysis for structures' primary components and piping systems, the applicant performed a review of test information for electromechanical equipment. The applicant provided comparisons between site-specific Required Response Spectra, or RRS, for high-frequency sensitive equipment and corresponding Test Response Spectra, or TRS, based on AP1000 requirements. Staff reviewed these comparisons and found them to demonstrate that the site-specific

Required Response Spectra for representative high-frequency sensitive equipment are bounded by the Test Response Spectra based on AP1000 requirements. Further, the applicant committed in the FSER to ensure that all future Test Response Spectra for high-frequency sensitive equipment will envelope the site-specific Required Response Spectra.

In conclusion, based on a review of the multiple aspects of the applicant's site-specific evaluation, including request for additional information and audit of the applicant's structural analysis, the staff found that Lee Departure 2.0-1 is acceptable because the applicant's site-specific evaluations demonstrated in each of the three specs that the AP1000 DCD design is adequate for use at the Lee site and that these evaluations are consistent with the AP1000 DCD criteria, the guidance in the standard review plan, and Interim Staff Guidance.

This concludes my portion of the presentation. Thank you for your attention, and I will now turn over my presentation to Mr. Kenneth Thomas.

MR. THOMAS: Thank you, Robert. My name is Kenneth Thomas, and I'm an Emergency Preparedness Specialist in the Policy and Oversight Branch,

Division of Preparedness and Response, Office of Nuclear Security and Incident Response.

Slide 13, please. I will be addressing the Duke Energy Carolina, or DEC, request to use the existing corporate Emergency Operations Facility, or EOF, located in the Duke Energy Center in Charlotte, North Carolina for the proposed Lee site. Since the location of the EOF is greater than 25 miles from the Lee site, Commission approval is required in accordance with Appendix E, Section IV, of 10 CFR Part 50 prior to implementation of the EOF for the Lee site.

Slide 14, please. As part of the Lee COL application, DEC requested to locate the EOF for the Lee site in existing corporate EOF located in Charlotte, North Carolina. The Commission previously approved the corporate EOF for the McGuire, Catawba, and Oconee Nuclear Stations in a staff requirements memorandum for SECY-05-0172. The staff's review of the request focused on meeting the requirements for an EOF in 10 CFR 50.47(b)(8) and in Appendix E, Section IV. The staff reviewed the description of the EOF in the emergency plan, which is contained in Part 5 of the application. The NRC staff reviewed the justification for the use of the existing EOF for the

proposed Lee site, which is provided in Appendix 9 to the emergency plan.

Slide 15, please. As a result of its review, the staff found that the EOF will have the capability to obtain and display plan data and radiological information and the ability to analyze plant technical information.

Slide 16, please. Additionally, the staff found that the EOF will have the capability to provide technical briefings on event conditions and prognoses, as well as determine recommended public protective actions to federal and state response organizations for each unit at a reactor site and for each site that the EOF serves.

Slide 17, please. The staff documented its findings and conclusions in Chapter 13, Conduct of Operations, of the final safety evaluation report that the corporate EOF will meet the regulations contained in 10 CFR 50.47(b)(8) and in Appendix E to Part 50 and conforms to applicable staff guidance, subject to the completion of the inspection, test, analysis, and acceptance criteria and License Condition 13-7, which will require DEC to perform an integrated full-scale NRC and Federal Emergency Management Agency evaluated exercise to test the activation, the operation, and

the capability of the EOF for the Lee site and one additional nuclear site that is supported by the EOF prior to fuel loading.

Slide 18, please. Per the staff requirements memorandum for SECY-10-78, the staff requests the Commission to make a determination of the acceptability for the EOF for the Lee site as part of this hearing. In their December 14, 2015 letter, the ACRS recommended that this request for an EOF should be approved.

This concludes the staff presentation for this safety panel.

CHAIRMAN BURNS: All right. Thank you. Thank you all. Actually, I think you're seated just fine. I can see everybody pretty well. It looks okay for you all? Okay, good.

And I believe we start with Commissioner Baran.

COMMISSIONER BARAN: Great, thanks. Well, thank you for all your work on this review and for your presentations. I want to pick up right where we left off on the EOF request to use the existing corporate EOF in Charlotte, rather than something closer to the Lee site.

The AP1000 would be a new technology for

the EOF in Charlotte, and responses to pre-hearing questions explained that it will be staffed from the general office in Charlotte, as well as the Catawba and McGuire sites. And the responses to the questions also noted that the EOF director, assistant director, and accident assessment manager are required to take training to cover multiple reactor technologies.

Let me start by asking Duke will other EOF staff be receiving AP1000-specific training, and how did Duke determine which EOF personnel would need AP1000-specific training?

MR. KITCHEN: I think, procedurally, the only requirements for this training are the ones we specified, the EOF director, accident assessment leader, and the third. But the reason for those positions requiring training is those are key positions in the Emergency Operating Facility that are coordinating response to an issue.

There's a statement that we have folks from the corporate office, as well as the plants, and there's going to be some variation in which folks are from which plants, just from staffing and flexibility. So by default, some folks would be trained by virtue of being from their plant, but that's not specified in the procedure. So the only ones that would be, you

know, right now I can tell you would be trained are the director positions and accident team leaders.

COMMISSIONER BARAN: And those key positions would receive AP1000-specific training?

MR. KITCHEN: Correct. And it's also focused, as you can imagine because of the purpose of the facility, on how to deal with mitigating beyond design basis type events or significant accidents.

COMMISSIONER BARAN: Kenneth, did the NRC staff have any concerns during your review that the Lee EOF would be staffed with personnel who wouldn't be gaining first-hand operational experience with this design at the Lee site?

MR. THOMAS: The staff reviewed the application materials and the content against the applicable guidance that we have and the regulations. It did not cause me particular concerns about Duke not identifying the specific training since the training aspects is something that would be one determined during a job task analysis and so forth for the key positions. It didn't raise any more concerns. I knew that that would be addressed since they would be taking care of that during the operator training and any additional training that they would have to identify by using a systems approach to training.

COMMISSIONER BARAN: Okay. Well, this could be a follow-up question for you or for Mr. Kitchen if you want to jump in. I mean, so if the EOF were on-site at Lee, presumably it will be staffed by operators from Lee who are, you know, very familiar with the site, they're working there at the site day-in and day-out. You know, a potential disadvantage of having it in Charlotte is you wouldn't have that. You'd have folks who were, you know, from the corporate office or from other sites and weren't having daily operational experience at the Lee site.

How did you evaluate the pros and cons of that? Does it cause you any concerns? Are there ways you're going to address that to make that, you know, you have folks there, if it ever came to pass that you used the EOF, that were really familiar with the Lee site?

MR. KITCHEN: I guess I'll start, and if John wants to add anything or Kenneth. But the way we look at this, I mean, thinking about the nature of the facilities, on-site you have your operational support center, Technical Support Center, and of course the control room. Those folks are AP1000, you know, site trained individuals, and, obviously, they're directing, you might say, the technical response to

the unit issue.

The EOF has moved back, essentially, a level. It has a large function in terms of coordinating communication and bigger-picture aspects of a max of mitigation. So the need for a lot of detailed-trained folks, whether it's an AP1000 or a boiler water reactor, would be less so in an EOF than certainly the site facilities.

The other thing I would say, and it's not necessarily true across the board for EOF locations, but in this case we're 40 miles from the plant.

COMMISSIONER BARAN: Okay. And let me ask, so that's a very good point about the Technical Support Center, and Duke's requested a departure to provide for a common Technical Support Center for both units, and that departure would modestly increase the travel time from the control room to the TSC during emergency.

What was the thinking behind requesting this departure? Did you see advantages or efficiencies in emergency preparedness or having a combined TSC?

MR. KITCHEN: Yes. Well, I would, I mean, the AP1000 standard design has the technical support center located in the unit. So what we're doing is

creating a common location for the Technical Support Center. That's a similar change to what was done on the Lee plants, as well. And I would just say from my own personal experience, as a dual-unit boiling water reactor, we had a common TSC.

The travel time, you know, it's really not a significant difference from the travel time into that location where it was designed --

COMMISSIONER BARAN: A couple of minutes versus, on top of the couple of minutes that it would otherwise take.

MR. KITCHEN: Yes, sir.

COMMISSIONER BARAN: Okay. And, Kenneth, was there any additional analysis the staff did to evaluate that departure, that requested departure?

MR. THOMAS: We reviewed the departure and the application materials there, and we found out that the advances from the 1980s, when the guidance from NUREG-0737, Supplement 1, recommends the TSC be located within two minutes of control room. The advances in communications has pretty much compensated for a lot of the necessity of having a face to face. The data sources, all of the data parameters that are available in the control room are, by far and large, available in the TSCs. So the actual need for a face-

to-face communication is mitigated, to a large extent, by the various communication networks, as well as the data networks, that have come in line during the last 35 years.

So we analyzed that and we looked at the information that Duke had put into the application, and we documented our review in the FSER, and we took into consideration what we have done with other facilities, as well. We feel very confident that they're meeting the intent of the underlying guidance of being able to have data communications available to communicate between the leader in the control room and in the TSC.

COMMISSIONER BARAN: Okay. Thank you. Let me ask one additional issue. I think it would be a question for the staff. Pre-hearing question 13 asked about the license condition for removal of the Cherokee project storm water drain line, and the staff noted in its response to that pre-hearing question that no other legacy structures affected the staff's hydrologic review.

The FSER also contains commitments for the removal of other legacy structures, groundwater drainage system, other legacy structures. While the removal of these other structures may not affect the

hydrologic review, were the staff's safety conclusions on structural or seismic issues predicated on the removal of these additional legacy structures?

MR. HUGHES: My name is Brian Hughes. What the staff reviewed was the accidental release of a waste, radioactive waste storage tank and the path that tank would take to get to the target or whatever the target, wherever the target area is. Their review, it assumed that that legacy drain would be backfilled and it would be backfilled, removed and backfilled with similar material that was used during their evaluation. They also found that there was no other legacy issues for that analysis, and that was the reason that we -- we went back and forth on whether that should be a license condition or not, but we decided in the end, since that was part of our basis, for saying that it was acceptable that we would make it a license condition.

COMMISSIONER BARAN: What I'm trying to figure out is whether or not for outside the hydrologic space, you know, if we're talking seismic or structural, did the staff similarly reach conclusions on those that were predicated on these other legacy structures being removed? And I guess the question that that leads to is, what I'm trying to

figure out is does it make sense for these to be FSER commitments or are these, should these be license conditions because the staff's non-hydrologic analysis depended on the removal of those structures?

MR. HUGHES: I understand your question a little better now. The staff did look at the legacy components that were there, and none of the legacy components had any influence on the actual analysis in any way.

COMMISSIONER BARAN: Okay. Well, that answered my question. Okay, thank you. Did you want to add anything on seismic?

MR. HUGHES: No, I think we're fine with the answer.

COMMISSIONER BARAN: Thank you.

CHAIRMAN BURNS: Thanks, Commissioner. Let me ask a couple of questions. Actually, it's somewhat follow-up to Commissioner Baran's question. The Unit 2 COL has a license condition which is not found in Unit 1. This is License Condition 2(d)(12)(e), which requires to perform geologic mapping of excavations for safety-related structures, examine and evaluate geological features discovered in the excavations, and inform the director of NRO in writing once excavations for these safety-related

structures are open for examination.

So it appears only in the Unit 2 COL. Is this because of the prior, that the Unit 1 is on the prior siting, or can you explain for me the rationale for it being in 2 and not in 1? Staff, go ahead.

MR. HUGHES: Yes. Again, this is Brian Hughes. Unit 1 had pre-Cherokee concrete poured over the site. What we did was we looked at the inspection report in the documents in the library public document room which existed that Unit 1's Cherokee site was inspected by Region II prior to the application of the concrete above it. They also had the --

CHAIRMAN BURNS: And this is, just to make sure I'm clear, this is in the time frame within the late 70s - early 80s time frame?

MR. HUGHES: I'm not sure if it was in the 70s or --

CHAIRMAN BURNS: But we're talking -- yes, yes, okay. Sorry, go ahead.

MR. HUGHES: It might have been '74. But so -- and what they did was they took those documents, they recreated a geological mapping from the original documents. The original geographical map was not completed because they abandoned the site, but they still had the original surveys and the charts, and

that was reviewed by us very well. Is Gerry Stirewalt available? Yes, perhaps Gerry could describe that to you.

CHAIRMAN BURNS: Welcome back. We're not going to talk about cars today, though, I don't think, right? Go ahead. Identify yourself -- I know you were put under oath -- and then proceed.

DR. STIREWALT: Thank you, Mr. Chairman. I'm Gerry Stirewalt. I was the senior geologist on Lee, and I am excited to get the question about geology for sure.

What Brian said is absolutely correct. We looked very carefully at the rejuvenation of the original work that was actually done in the 70s for Cherokee 1 and the individual that actually recompiled stuff from his notes was the individual who led that mapping effort. So we looked very carefully. I mean, somebody who really knows his stuff, so we looked at the features that were on those maps, checked things like, well, okay, what about the orientation of the structures that you measured beneath the concrete, do they reflect what we see in Unit 2? Well, guess what? Yes, they did.

And the other thing, the other thing that we did, we didn't just look at the maps, we also

looked around the edges of the concrete where some of those structures actually exited the concrete. One particular fault that was the largest structure, still very old because they had really good age date control on it, but we actually looked at that particular feature in the field where it was exposed on the southern edge of Unit 1. So we actually looked at the major structure that was really beneath that site. So it really felt good.

CHAIRMAN BURNS: Okay, great. Well, I think you've given a good explanation for the, you know, in terms of the condition and the understanding we have from the prior work that was done on the site. So I appreciate that.

I'm going to pose a question to the applicant. In pre-hearing question 12, which had been asked related to the fact that the Lee site-specific horizontal and vertical spectra exceeded the Certified Seismic Design Spectra and the Hard Rock High Frequency Spectra for the AP1000, the applicant's response provided the FSER text contained a commitment to ensure that future seismic qualification testing for high-frequency sensitive safety-related equipment were within the envelope for the Lee site-specific requirements. And this FSER also describes equipment

qualification programs conducted as part of the standardized effort in support of the entire fleet of the AP1000s. It notes that the completed testing showed that the Test Response Spectra show that for Lee it was within it by a significant margin.

So my question to you after that long introduction is can you tell me a little bit more about the standardized, this standardized effort across the AP1000, who's conducting the testing, and how are the results shared among the AP1000 applicants and licensees?

MR. THRASHER: Yes. A standard approach to the testing is something that is developed and performed by Westinghouse, so they develop a Test Response Spectra that basically bounds the Certified Seismic Design Response and also the HRHF Spectra, and then we'll also look in the reports or the testing that had been done to date on those high-frequency sensitive components. Those test results or test spectra that envelope those two spectra were also reviewed to ensure that they envelope the Lee site spectra.

And so in going forward, Westinghouse, as they continue to procure that equipment, so procurement requirements and also, at the Lee site,

our design control process will have to include steps to ensure that any future equipment replacements. So on initial construction of the plant, the procurement should control and Westinghouse would control ensuring the Test Response Spectra bound CSDRS, HRHF Spectra, and the Lee site spectra. And then going forward, if we had to do maintenance work and, say, replace one of those components, our procurement design control processes should ensure that that test spectra again exceeds those three spectra.

CHAIRMAN BURNS: Okay, thanks. Thanks very much. I'm going to ask one last question, go back to some of the questions, the issues on the EOF. One of the things when we go back in the historic record with respect to the approval of the 2005 approval, basically, to consolidate the EOF for Oconee into the Catawba and McGuire EOF, and in the staff requirements memo in 2005, the Commission noted two conditions for approval. One of the conditions required Duke to provide a functional working space for up to ten people, including NRC, state, and FEMA representatives at the former Oconee or equivalent near-site facilities. Is this type of condition in the approval for the Lee application?

MR. THOMAS: As part of the License

Condition 13-7, we are requiring Duke DEC to perform an NRC/FEMA evaluated drill that does take at least one unit at Lee and one other unit or site from the Lee network.

CHAIRMAN BURNS: Okay. At the same time. But my question goes to this functional working space issue. Okay. Mr. Hughes?

MR. HUGHES: This is Brian Hughes. Part of the initial presentation by the applicant stated that they have a training center, I believe it's about 15.5 miles from the facility. That training center is also equipped with indication from the plant. They have plant indications. They have room for the NRC staff and supplemented staff. They have room for briefing of the local responders.

So it's a fairly large facility. They have integrated communication systems. They have, similar to our emergency operations center, basically. You have that type of indication that will be available there. So there's reproduction stuff.

So there's everything that the staff would need and, having been a previous inspector, I took a hard look at that list and I'm very well convinced that it is adequate.

CHAIRMAN BURNS: Okay, all right. Thanks

very much. Commissioner Svinicki?

COMMISSIONER SVINICKI: Well, thank you to both the staff and applicant safety panels for their presentations. Just to confirm my understanding of testimony already given, I think this is for Duke, for all of the removal of residual Cherokee structures that will be necessary for the potential construction of the two Lee units, have all of those residual things that will be removed have been removed, or is some of that work yet to be done?

MR. THRASHER: There's still some of that work to be done. Basically, the demolition removal work that we've done to date was focused on above-ground structures.

COMMISSIONER SVINICKI: Okay.

MR. THRASHER: We still have some buried piping and electrical items that require removal when we move into construction, but we decided to minimize ground disturbance and wait and do that at a later time.

COMMISSIONER SVINICKI: Okay. Thank you for that clarification. I was just uncertain because some of what you had, you had presented the photos that it looked like a number of things had already been removed.

I guess to return to the common EOF topic, I have had the opportunity to visit, in combination with visiting some of Duke's operating reactor sites in the area, to come to the common EOF facility. It was not activated for an exercise or anything at the time but just looking at it as it stood empty, it is expansive, provides a lot of capability. There are a lot of response assets there, and it looks like it could house a significant number of responders and other experts. It is also, as I think Commissioner Baran mentioned, co-located with other corporate offices of Duke. And it was my understanding that there would be officials with technical knowledge that would also, if they happened to be available right there, would have knowledge of the various operations of some of these facilities.

I think when we use the word corporate, there's two ways of thinking of it, is that it's more kind of administrative and financial functions, but my understanding there are also executives with extensive knowledge and others that, if it were during working hours, might also be available. Am I correct in that impression?

MR. THRASHER: Yes, that's correct. The Nuclear Generation Department, there's several hundred

fleet employees with knowledge and manage major fleet engineering programs that are housed in the --

COMMISSIONER SVINICKI: And I ask that question or I asked you to confirm that just because it was my understanding after visiting that, from Duke Energy's perspectives, that's one of the advantages. Anything is a weighing of advantages and disadvantages to have something more remote, but it isn't remote from everything, although I principally asked the question because I had an enduring a couple days of Charlotte traffic, which I had no idea was as horrible as it is. And so my thought was during rush hour, you know, can people really get here? But I think a very valid response to that was, well, on the margins of the workday, there are likely to be a lot of people already present here because they work here at least five days a week. So thanks for confirming that understanding.

But it does bring to mind, and particularly in light of the Chairman's quoting of the 2005 staff requirements memorandum calling for space for ten, I think, state and other response officials, there's tremendous capability in the EOF that I toured, but there is also this separate proposal that, as the applicant, you at least notified us of to add

progress, legacy progress operating reactors to the common EOF.

Is there some kind of natural tipping point where it's like so many units added to a common EOF that, you know, it's no longer practical to be managing a multi-unit event out of a common EOF? Or if there is a tipping point, do you feel you've not reached it with the proposals that you've already sent? Obviously, you feel that way or you wouldn't have requested approval of that.

MR. KITCHEN: I don't know how to draw the line on what's the max. But, you know, we will demonstrate a combined event two different stations as part of our requirements for our license, and I believe there's a similar requirement in the fleet license amendment request, as well.

COMMISSIONER SVINICKI: Well, rather, maybe -- and I agree with you that the question wasn't very well structured on my part, but let me ask it this way: with this request and the staff has confirmed that they proposed that NRC add Lee to the common EOF, you have another separate action before the Agency about other progress energy legacy units that potentially would be added.

Does any of that necessitate, if all those

things were approved, does that necessitate an expansion of the capability that I toured in Charlotte?

MR. KITCHEN: Well, certainly, the displays have to replicate the plant, and I don't think those data feeds are there, that sort of thing. I don't think, you know, I can speak for the Lee application. There's not an expansion in terms of size of the facility plan for Lee. I don't believe there is for the fleet LAR, but I'm not familiar enough.

But I don't know that the ability to display a lot of information with computer displays and the ability to switch between displays and look at various combinations of displays is significant with computer capabilities. So I don't know that really floor space is -- I think it's really more data display.

COMMISSIONER SVINICKI: Okay, thank you. Kenneth, would you like to add anything from the staff's perspective on that line of questioning?

MR. THOMAS: I'm going to turn this over to Mr. Barss. He's more in tune with what's going on with the Lee or the Duke Energy LAR than I am.

COMMISSIONER SVINICKI: Okay, great.

MR. THOMAS: Mr. Dan Barss.

CHAIRMAN BARNES: Identify yourself and --

MR. BARSS: Dan Barss, I'm Team Leader in the Office of Nuclear Security and Response responsible for the emergency planning reviews.

And, it's a good question you asked, is there a tipping point and when do you reach it? And, I think that's a question -- it's a global question, but I think the answer is more you have to look site-specific or case-specific that we're looking at.

In this case, Duke, most of their facilities are in two states. So, all of the emergency responders, or most of the emergency responders, for the state and local governments are used to going to that facility for the existing units that are there, and, you know, be added in if these other three, which is a different licensing action, so we're really not focusing on it here today, but if those other three are joined with, they're still the same state people.

So, it kind of, I don't want to say makes sense, but it kind of fits together nicely.

Now, if you start talking on a bigger geographic area, Florida or something like that, well, now you're getting a little far out.

So, I think we, as a staff, need to look at it on a case by case basis and then would make our recommendations to you the Commission.

COMMISSIONER SVINICKI: Well, and it sounds like it you're saying that it -- some of the capability cuts both ways, meaning that, even if you were managing a response to a multi-unit event, as far as Duke's perspective, if they're dispatching corporate resources or individuals, the ability to have that integrated, that's actually an advantage of managing more of it out of one location.

Because, some of these are assets, and maybe I shouldn't refer to people as assets, but responders you're dispatching, that way, there won't be claims on the same kind of resource and you would have a real cohesion to it.

MR. BARSS: Yes, I agree with that.

COMMISSIONER SVINICKI: Okay, thank you.

And, Mr. Chairman, although I am desperate to think about -- think of a geology question or a CARs question, because we need that kind of energy before lunch, I cannot -- the record was so clear on many matters related to geology that I just simply can't think of anything.

So, I yield back, thank you.

CHAIRMAN BURNS: We can think over lunch.

I think, unless there's anything else, again, I appreciate the panelists for this safety panel that we've had this morning.

Again, we will take a break. We're done a little bit early, but we plan to reconvene at 1:15 with the environmental panel and the remainder of today's proceeding.

We are adjourned.

(Whereupon, the above-entitled matter went off the record at 11:33 a.m. and resumed at 1:16 p.m.)

CHAIRMAN BURNS: Okay, we'll bring the hearing back to order.

And, this panel is the environmental panel.

What I might ask our staff witnesses to do is maybe move to the side, at least for the beginning of the presentations here because I think the Applicant's going to go first and then we'll bring you back there. That way, it's sort of an unobstructed view.

So, just -- or you can sit at the table, I'm just saying, move the -- make it more like -- there we go, that's -- I think that's better.

So, again, this is the environmental

panel. The parties will address the final Environmental Impact Statement, and particularly, one novel issue that the staff has identified regarding the proposed location of a new off-site reservoir, Make-Up Pond C which we identified during some of the testimony early this morning.

Again, I remind the witnesses on each panel, you remain under oath and should assume that the Commission is familiar with their pre-hearing filings.

And, I'll ask then the Applicant's witnesses, again, to introduce themselves and they will proceed.

And, after that, we'll hear from the staff.

So, Mr. Fallon, you want to start the introductions again?

MR. FALLON: Chris Fallon, Duke Energy.

MR. KITCHEN: Bob Kitchen, Duke Energy.

MR. SNEAD: Paul Snead, Duke Energy.

MR. THRASHER: John Thrasher, Duke Energy.

CHAIRMAN BURNS: Okay, and you may proceed.

MR. SNEAD: Thank you, Chairman.

Again, I'm Paul Snead. I'm the Siting and

Licensing Support Manager in Environmental Services for Duke Energy.

And, slide two, please?

So, by way of quick summary, again, the Environmental Report was submitted in December of 2007 and Duke Energy supplemented that in September of 2009.

There was thorough NRC staff audit of the Environmental Report and the alternative site analyses that have been performed by Duke Energy.

Note, that for the alternative site analyses, the final Environmental Impact Statement concluded there was no obviously preferable alternative site and no obviously superior site.

And, the Army Corps of Engineers, in their 404 permit determination, also determined that Lee was the least environmentally damaging practicable alternative site.

There was extensive public outreach for both the initial and the supplemental scoping processes associated with the application.

And, of course, consultation with federal, Tribal, state and local government entities.

The final Environmental Impact Statement was published in December of 2013.

Since that time, new and significant information reviews have been conducted approximately on a semiannual basis. And, the process and specifics for that were audited by the NRC staff in February and March of this year.

Next slide, please?

You've seen this graphic before, but it shows the Lee Nuclear site in the shaded area with Make-Up Ponds A and B shown and the Broad River crossing across the upper portion of the site.

You see the Ninety Nine Island Dam there. That creates a reservoir on the Broad River that is managed as a FERC project.

Pond A and B were previously constructed for the NRC permitted Cherokee Site and Pond A will serve as a sedimentation basin. Pond B will serve as a supplemental cooling water supply in low river flow instances.

Of course, you see, we made the determination after the droughts in 2007/2008 that we felt we needed more drought contingencies. So, we sought to find additional drought contingency make-up water ponds and that's what Pond Charlie is there that you see off-site.

The red line surrounding that is the

property boundary around the proposed pond. And, that pond is created on London Creek which flows into the Broad River.

Next slide, please?

So, again, following that severe drought in 2007/2008, we planned for an off-site reservoir for supplemental cooling tower make-up water.

The supplement to the ER was submitted in September of 2009 to add Make-Up Pond C as a drought contingency and to minimize shutdowns of the plant during low river flow conditions.

The NPDES operating permits was issued by the South Carolina Department of Health and Environmental Control in July of 2013.

That permit establishes an alternative 316(b) requirement that is demonstrated to be more protective than the five percent proportional mean annual flow requirements that are normally applied.

It basically allows for reduced withdrawal in low flow conditions on the Broad River and greater withdrawal during high flow conditions on the Broad River to refill the make-up ponds.

So, it provides for an effective, on average, 3.8-4.4 percent mean annual flow withdrawal from the Broad River in the big picture of things.

And, it's also more protective with regard to entrainment because we're restricted from withdrawing water to refill Make-Up Ponds B and C during the spawning season. And, this provides for the refilling of Make-Up B and C when the Broad River flows are high.

Next slide, please? The Army Corps of Engineers permitting was critical for this project and they were a cooperating Agency with the NRC in the preparation of the final Environmental Impact Statement.

Compensatory mitigation plan was developed to support that permitting. And the mitigation plan includes a significant stream restoration project with the U.S. Forest Service in Sumter National Forest.

There's also a stream preservation and enhancement conservation project on the Turkey Creek site which is owned by Duke Energy.

So, the 404 permit issued by the Corps in September of 2015 memorializes that mitigation plan.

And, next slide?

And, that concludes our environmental presentation.

Thank you.

CHAIRMAN BURNS: Okay, thank you.

And, I'll ask the staff witnesses to come there and, yes, you can -- or maybe sit -- okay, maybe we're fine for now.

Why don't you go ahead and identify yourselves and then proceed?

MR. VOKOUN: Patricia Vokoun, Environmental Project Manager for Lee.

MR. VAIL: Lance Vail, Senior Research Engineer at Pacific Northwest National Lab who assisted the NRC.

CHAIRMAN BURNS: Okay.

MS. VOKOUN: Good afternoon.

Slide two, please?

I am Patricia Vokoun, the Project Manager for the Lee Units 1 and 2 Environmental Review.

With me today is Lance Vail, a Senior Research Engineer at the Pacific Northwest National Lab.

During this afternoon's presentation, I will discuss the Make-Up Pond C review, including the background evaluation process, the impacts we identified and the compensatory mitigation plan.

Lance will discuss the water storage options considered by the review team.

Slide three, please?

The Lee Units 1 and 2 COLA application initially proposed a two-pond off-stream water storage system using existing Make-Up Ponds A and B. Make-Up Pond B was to be used in low water conditions as the backup to Make-Up Pond A, which draws water from the Ninety Nine Islands Reservoir.

The Ninety Nine Islands Reservoir is an impoundment on the Broad River formed by the Ninety Nine Islands Dam and adjacent to Lee.

It is also the water source for the Ninety Nine Islands hydroelectric project.

Lee Units 1 and 2 would have to operate within the minimum release constraints of FERBs Ninety Nine Islands Hydroelectric Project license.

The Ninety Nine Islands Reservoir was built for hydroelectric power, not flood control. So, it has no substantial storage capacity.

According to Duke's original plan, Lee would withdraw all of its operational water requirements from the Ninety Nine Islands Reservoir through the intake into the existing Make-Up Pond A during normal flow periods on the Broad River.

Duke anticipated this withdrawal plan would be used greater than 95 percent of the time.

Duke initially proposed that Lee would

proportionately withdraw its consumptive water from Ninety Nine Islands Reservoir and Make-Up Pond B as the Broad River flows drops below normal flow.

Slide four, please?

The EIS review team, which was comprised of the NRC and the U.S. Army Corps of Engineers looked at the Lee Units 1 and 2 COLA application water data and found that the 2007 through 2008 drought years for this region were not included in the Applicant's water balance calculations.

The review team determined that low water flows at certain times of the year would have resulted in adverse impacts out aquatic biota and downstream water users with the additional data included under Duke's original plan.

If the water supply were interrupted causing Lee Units 1 and 2 to cease operation frequently, the Lee Plant could not meet its stated need as a reliable source of based load power.

Slide five, please?

Duke subsequently revised its water balance calculations to incorporate the 2007 through 2008 drought years. This revision led Duke to propose an additional off-site reservoir known as Make-Up Pond C, a supplemental storage to Make-Up Ponds A and B.

Make-Up Pond C's sole purpose would be to provide make-up water.

This image shows the originally planned Lee site on the right with Make-Up Pond C on the left. Please note the relative size, remembering that the original site was previously disturbed for the proposed Cherokee Plant whereas the Pond C was not.

The NRC staff conducted a supplemental scoping process to obtain additional public insights and informed the NRC's review of Duke's supplement to the Environmental Report.

The primary change to the Environmental Report was the evaluation of options to address the possible water shortage and ultimate proposal of Make-Up Pond C.

Lance will discuss the water storage options review next.

Slide six, please?

MR. VAIL: The review team reviewed Duke's Environmental Report Supplement. We developed our own daily water budget model to evaluate a range of scenarios and design options.

The review team confirmed Duke's finding that without a preventative option, extended periods of loss of make-up water would occur.

We evaluated water storage options, other pond locations and other cooling system designs.

The staff made Requests for Additional Information about opportunities to minimize the impact of Make-Up Pond C by reducing water requirements using hybrid cooling towers and increasing the storage capacity of Pond B.

Today, we plan to discuss the hybrid cooling review because that was the alternative with the best potential to eliminate entirely or reduce the size of Make-Up Pond C. As such, it merited further investigation.

Hybrid cooling is a combination of dry cooling towers and wet cooling towers used to reduce overall water use. The design would conserve water.

However, hybrid designs are more sensitive to air temperature than are wet only designs due to the dry component.

This technology is used in the United States and internationally, but not at the size that would be required for Lee.

Therefore, we have limited experience with existing deployed hybrid technology to rely on on comparing potential impacts from that of the hybrid alternative to the proposed cooling design.

Regardless, the staff understands the physics of the design sufficiently to make a definitive assessment in this case, even if we do not know the full extent of engineering issues that may exist with hybrid designs.

Slide seven, please?

Duke provided an analysis of a hybrid cooling system design for proposed Lee Units 1 and 2. The review team conducted a more detailed alternative systems analysis to investigate other cooling technologies because of the degree of the impacts of constructing Make-Up Pond C.

As part of the analysis, the review team considered whether Duke could eliminate the need for Make-Up Pond C by using other heat dissipation technologies for condenser cooling.

The focus was on the combination wet/dry hybrid cooling tower system.

The review team conducted a supplemental audit of cooling system and energy alternatives and requested and reviewed information regarding the water budget calculations.

The conclusion we reached after the audit and review of the responses to information needs was that hybrid cooling systems would not eliminate the

need for Make-Up Pond C or the impacts associated with its construction.

Further, the hybrid cooling system still poses several considerable technical challenges for its installation and operation while it appears to be feasible for the Lee site.

For these reasons, the staff's conclusion was that the building and operation of a combined wet/dry cooling tower system would not be an environmentally preferable alternative for Lee.

That concludes my presentation. Pat will now discuss the outcome of our mitigation analysis.

MR. VOKOUN: Slide eight, please?

The creation of Make-Up Pond C would inundate most of the London Creek stream network and forested valley, converting approximately 600 acres to a supplemental water reservoir to be managed as a cooling water supply.

Make-Up Pond C alone would impact approximately 12 and a half miles of streams, three and a half acres of wetlands and 17 and a half acres of open water.

Impacts to streams from Make-Up Pond C would account for most of the Lee projects aquatic impacts.

Approximately 1,100 acres is needed to build a reservoir and buffer around Make-Up Pond C.

Through careful consideration of the potential impacts of the Make-Up Pond C plans, the review team determined that the proposed disturbance would alter the nature of the terrestrial and aquatic habitats and wildlife resources in the London Creek watershed.

The review team determined that the related terrestrial impacts of habitat loss and wildlife mortality disturbance and displacement would be substantial and mostly permanent in nature.

Slide nine, please?

This image shows proposed Make-Up Pond C in more detail. The proposed Make-Up Pond C is shown by the stiping. The underlying London Creek that would be flooded can be seen in blue.

Slide ten, please?

Creation of Make-Up Pond C also would alter the functionality of the London Creek corridor as a wildlife travel corridor, particularly for some migrant songbirds, many of which are conservation priority in South Carolina.

The review team also determined that impounding the London Creek stream network and

building the Make-Up Pond C supplemental water reservoir would replace and existing creek system with a deep water lake habitat resulting in a clearly noticeable and permanent change in aquatic resources to London Creek and its tributaries.

Although the aquatic resources found in London Creek are not unique to the region, the habitat type is becoming increasingly rare as development in the region increases.

In time, the aquatic habitat of the new reservoir would be valuable for other reasons, but it would not mitigate the loss of adjacent terrestrial habitat within the region.

As a result of its review, the review team determined that the construction of Make-Up Pond C would have moderate aquatic and terrestrial impacts. The impacts would noticeably alter these resources, but the important aspects of these attributes would not be destabilized as habitat and wildlife resources found in the London Creek watershed are also found in other areas of the surrounding upstate Piedmont Region.

Slide 11, please?

The impacts to waters of the U.S. resulting from the construction of Make-Up Pond C

necessitate a large-scale compensatory mitigation project to comply with the Corps of Engineers mitigation requirements intended to offset the project's impacts.

To meet this need, Duke plans to accomplish a stream restoration and preservation effort at two separate locations, the privately owned Turkey Creek Tract and the Woods Ferry Study Area in the Sumter National Forest.

This image shows the proposed -- the proximity of the mitigation sites to the Lee site.

The Turkey Creek Tract will have a perpetual conservation easement. The Turkey Creek Tract offers an opportunity for mitigation that is substantial enough to provide regional benefits in the form of preservation and buffer enhancement.

The goals of the Woods Ferry Study Area restoration effort are to reconnect streams to their respective flood planes, to reduce sedimentation and stabilize stream banks, to improve in stream and adjacent habitats and to improve water quality.

While these restoration efforts are expected to mitigate the environmental impacts of Make-Up Pond C, the review team determined that impacts to the resources areas would remain moderate,

given that the steam ecosystem will be removed.

Slide 12, please?

As part of the permitting process, the Corps of Engineers collaborated with the U.S. Forest Service to develop details and implement mitigation requirements.

The Forest Service prepared an EIS to comply with NEPA regarding its own federal action to issue a Special Use Permit to Duke to complete the aforementioned compensatory mitigation work in the National Forest.

The Corps of Engineers served as a cooperating Agency.

The Forest Service final EIS contains an environmental review of Duke's plan compensatory mitigation work in the National Forest.

The Forest Service issued its record of decision and is postured to issue the Special Use Permit to Duke.

The Corps of Engineers issued its record of decision and a Department of the Army Permit to Duke for the Lee Units 1 and 2 in 2015.

The mitigation measures and requirements ultimately imposed by the Forest Service and the Corps of Engineering Permits are consistent with the

analysis and conclusions in the Lee final EIS.

Slide 13, please?

The NRC staff followed its processes to ensure a hard look at the environmental impacts of the construction and operation of Lee Units 1 and 2. In particular, the novel nature of the Make-Up Pond C development and the extensive compensatory mitigation plan.

In so doing, the NRC conducted an additional scoping process that further informed its review and preparation of the final EIS.

In addition, NRC conducted an additional audit and considered options to Make-Up Pond C.

NRC also worked effectively with the Corps of Engineers as an EIS cooperating Agency to take advantage of the Corps of Engineers' areas of expertise and permitting and requirements.

The EIS developed served both the Agency's regulatory needs and ultimately supported the Forest Service's work as well.

In sum, the analysis and conclusion in the final EIS reflected appropriate evaluation of the water supply needs of the Lee project and the associated impacts and mitigation measures.

The EIS collaboration also reflected

enhanced consistency and efficiency in the decision making of the NRC and other agencies under NEPA and related environmental requirements.

This concludes the presentation.

CHAIRMAN BURNS: Okay, thank you for that.

And, I believe I start off with the questioning on this panel.

Could you elaborate on the assertion, the conclusion that the -- how -- give me some better granularity, how did our EIS enhance consistency and efficiency in the decision making process?

MS. VOKOUN: Because the Corps of Engineers was our cooperating Agency, they had no need to issue a separate EIC, likewise, and their collaboration with the Forest Service, we effectively, as a federal group, we probably eliminated a couple of EISs.

CHAIRMAN BURNS: Okay, all right.

I'm going to -- a question for the Applicant.

In the answer to pre-hearing question 25 on the application to FERC to cover construction intake and discharge structures, the staff say the application of FERC is on hold in accordance with the Federal Power Act, can you elaborate on that? Is this

partly a timing thing until you make a decision on whether to proceed?

MR. SNEAD: It's very much a timing thing. Because typically, it needs to be applied for within five years of when we intend to make --

CHAIRMAN BURNS: Okay.

MR. SNEAD: -- the actual construction impact in the project. So that timing is not clear yet. So, we --

CHAIRMAN BURNS: Right.

MR. SNEAD: -- made final discussions with FERC to --

CHAIRMAN BURNS: Okay.

MR. SNEAD: -- approach that as of yet.

CHAIRMAN BURNS: Okay. So, that's something that would be dealt with as you get closer to a decision point and, you know, have to factor in and --

MR. SNEAD: The FERC authorization is one of the major permits we still need to obtain before we can begin.

CHAIRMAN BURNS: Okay, all right, thank you.

Let's see, let me turn to -- I'll turn to the staff here and talk about the consultation. This

is not the first time we've heard of this species of bat come up in these proceedings and I think it's come up, but it may have been in all three of four of them this year, the northen long-eared bat.

So, the Fish and Wildlife Services list it as threatened under the Endangered Species Act which occurred after the completion of the FEIS. As we all do -- conducted acoustic monitoring, submitted results to the NRC which identified nothing to indicate the presence of this species, federally or state protected bat species at the Lee or the potential Make-Up Pond C site.

And, we sent -- staff, on behalf of the NRC, sent a letter to Fish and Wildlife to which they responded and concurred with the staff's findings, as I understand it, that the proposed project may affect, but is not likely to adversely affect any federally endangered, threatened or proposed species.

And, but, in its letter, Fish and Wildlife notes the obligations under the Endangered Species Act must be reconsidered if a new species is listed.

My question is really to staff, how does this process work in terms of our consultation or information Fish and Wildlife? Are we required -- is it up to the point that the COLA is issued or is there

a further point in time in which the notification, obligation or consultation obligation persists?

MS. VOKOUN: In the environmental protection plan, it references a notification requirement on the Applicant and I believe its four hours within a discovery of some impact to an endangered or protected species.

CHAIRMAN BURNS: So, that's after the license is issues?

MS. VOKOUN: After the license is -- up to the license is issued, it's on NRC.

CHAIRMAN BURNS: Okay.

One of the things, I take it, in terms of the mitigation strategies, identify the Corps of Engineers, and this is for the alternative sites, this is meant -- this is, again, is from looking at the pictures, these are not -- this, I think this, I don't mean Turkey Point, or I guess Turkey Run, is it, there's some additional mitigation restoration of stream habitat in those areas.

Is this -- again, this is not an area that's otherwise currently would be affected by the project itself, but is in a way a substitute for mitigation for adverse impacts that would occur on the areas where the construction or the installation of

the additional pond is intended, is that correct?

MS. VOKOUN: That's accurate.

CHAIRMAN BURNS: Okay. And, how -- it would be interesting to understand, how is that identified as a potential mitigation strategy or the like?

MS. VOKOUN: I think I'm going to ask Mike Masnik to come forward and explain that in more detail.

CHAIRMAN BURNS: Oh, somebody else, that's not Mike.

MS. VOKOUN: Peyton, great, Peyton Doub, I'm sorry.

CHAIRMAN BURNS: Okay, identify yourself for the record. And, I know I saw you take the oath earlier.

MR. DOUB: My name is Peyton Doub. I'm a Senior Terrestrial Ecologist Wetland Scientist with the Office of New Reactors.

The compensatory mitigation plan which is required by the U.S. Army Corps of Engineers under the 2008 Mitigation Rule 33 CFR 322 is discussed in detail in Section 4.3.1.6 of the final Environmental Impact Statement.

Even though the -- it is compensatory

mitigation that provides mitigation credits for the impacts on the site, however, the sites that have been selected both private property and Forest Service lands, while they have experienced adverse degradation from past historical activities, have not been affected by the project.

CHAIRMAN BURNS: Okay. So, what the intention here is, is I take it, is recognizing that there will be an adverse impact from the project on the particular land and which it be sited or its supporting structures or ponds, this is a way of compensation for that by taking other land that is currently, I'll use the word subpar, and try and to restore that to a more idea habitat, is that correct?

MR. DOUB: Exactly.

CHAIRMAN BURNS: Okay, all right, thank you.

That's all for me, that's it.

Commissioner Svinicki?

COMMISSIONER SVINICKI: Well, thank you again to the staff and Applicant witnesses for their presentations.

A number of environmental topics were addressed in responses to pre-hearing questions. I found those very informative, so I don't have too much

to inquire about further than that.

I do have two questions and I think they're principally addressed to the staff, although, certainly, if the Applicant would like to respond in any way.

The first is, as of the hearing today, is the staff aware of any changes to any of the reasonably foreseeable future projects discussed in your cumulative impacts analysis that might alter the staff's conclusions?

I know it's been some time since you prepared the new insignificant spreadsheet that you prepare. So, is there anything that you've learned in that intervening period that would affect the cumulative impact analysis.

MS. VOKOUN: We are not aware of anything that has changed. It's not an economically robust area. And, so, it's probably a safe assumption that nothing has gone since.

COMMISSIONER SVINICKI: Okay, thank you.

And, just, in terms of the public scoping process and comments received on the draft EIS, could you just at a very high level talk about any broad themes that emerged there and, if so, just give us kind of a summary description?

MS. VOKOUN: Sure. In the DIS comment period, the main subject areas that came up were alternative -- I'm sorry, alternatives, energy alternatives. You know, comments along the lines of, we have many other options such as clean, renewable energy like wind, solar, thermal.

Uranium fuel cycle comments along the lines of, you know, comments about potentially contaminated soil and the groundwater and surface water hydrology.

They expressed -- comments expressed opposition to licensing at this proposed station because of perceived impacts on water resources, especially the Broad River.

COMMISSIONER SVINICKI: Okay, thank you.

Thank you very much, Mr. Chairman.

CHAIRMAN BURNS: Thank you.

Commissioner Baran?

COMMISSIONER BARAN: Thanks.

Lance, I want to start with Make-Up Pond C. So, the need to build Make-Up Pond C was discovered after the severe drought in the 2007/2008 time frame, we heard that earlier.

With climate change, there may be future droughts that are even worse than the 2007/2008

drought. Has the staff looked at the most recent National Climate Assessment or other research to see if the frequency, duration or severity of droughts is predicated to increase in the area around the Lee site?

MR. VAIL: We have. That was sort of part of our consideration and new and significant when we did the audit.

And, the conclusions about the changes in precipitation and temperature and stuff really haven't changed from the prior National Assessment. And, so, we're sort of in that same zone.

There is, however, information suggesting that, even though precipitation may remain normal and stuff, that may be a combination of more intense precipitation events and persistent droughts.

And, clearly, persistent droughts is something we were interested in. Because, if you look at the historical record that they provided, there were four periods that they would actually, in that period or record.

One was 2002 and one was 2007 and stuff. And, so, it's -- there's a bias in to more recent events.

So, we were aware of that and we

considered it.

COMMISSIONER BARAN: If the site were to experience droughts more severe than the one in 2007/2008, would Make-Up Pond C provide sufficient water for plant operations with out harming the environment?

MR. VAIL: Well, it's a matter of whether it would be able to operate. So, basically --

COMMISSIONER BARAN: When the plant would operate? Okay.

MR. VAIL: -- they would have to, you know, the plant would cease operations and stuff in our analysis. And, that was why we had originally driven this question was we had periods where even before the consideration, you know, when we considered Pond C, there were periods where they would have to cease operation for relatively long period of time.

And, that became a question of the sort of purpose and need for the plant if you have a source that is, even using historical records, is going to cease operation during hot, dry summer periods.

COMMISSIONER BARAN: Well, how much margin is built in here? How much more severe would a drought have to be than 2007 for the plant to need to shutdown because Make-Up Pond C wouldn't be adequate?

MR. VAIL: Well, I think, if you -- it's not -- you have to be careful on how you define a drought because it's also the persistence as well as how much the stream flow has dropped. So, you could have a more severe short drought and not have any impact at all.

So, it's a little complicated to explain. But, you know, they had estimated that they would have to draw, in 2002, they would have to draw on Pond C for 75 days, draw it down 19 feet.

And, if you look at the usable storage and you realize that as you go further down, you have less water and stuff, the first 19 feet is where most of the water is.

In 2007, wasn't as severe as that. That only required them 57 days and took them down 13 feet.

So, again, it's this question of the sort of persistence of events and stuff. But, it's, you know, I can't say, you know, I can't say that you can't have an extended drought period where this plant won't have enough water. I can't say that about any site.

COMMISSIONER BARAN: Mr. Snead, I saw you nodding throughout that. I mean, did you want to add anything to this discussion?

MR. SNEAD: Well, I agree with what Lance is saying.

I would point out that we evaluated the 85-year history of drought data that we have and, with Make-Up Pond C, we confident that we'll be able to operate during any of those past circumstances that we had, with the 2002 being the most severe in terms of the need for draw down because of the extended period of that drought.

We have anticipated future needs for water on the Broad River and built margin into our need for Make-Up Pond C which also would help us with -- if there were climate change issues that would come about in the future.

So, Make-Up Pond C does give us greater flexibility and margin. But, I would point out that Make-Up Pond C's need is a commercial need for our ability to operate and meet our purpose and need to produce electricity has no safety significance whatsoever.

COMMISSIONER BARAN: Okay.

And, Lance, you discussed in slide six, hybrid wet and dry cooling. Did the staff evaluate an alternative to Make-Up Pond C that would involve the plant utilizing dry or hybrid cooling only in times of

severe drought?

My understanding is that other plants have taken a similar approach. For example, the North Anna Early Site Permit describes a hybrid system that uses wet cooling towers the majority of the time, but switches to dry cooling when the water level in Lake Anna drops below a specific threshold.

MR. VAIL: Yes, and I'd clarify that a little bit.

They actually go from a full on wet system to a hybrid system when it drops below a certain level.

COMMISSIONER BARAN: Okay.

MR. VAIL: They never operate in a full dry mode.

COMMISSIONER BARAN: Okay.

MR. VAIL: So, and, that's the situation with North Anna and stuff.

COMMISSIONER BARAN: Okay.

MR. VAIL: And, so, the catch is, is that you're in a period of this persistent drought, where are you going to, you use -- you're going to save the water at periods -- you'd be saving water at periods that when you're withdrawing it from the river when you typically don't need it because that's -- by

design, that's taking it out during periods of the higher flows. So, it's not really having, you know, an adverse impact.

We worry about droughts, but we also worry about floods. So, nobody wants the high flows either. So, they're, by design, taking out that higher flow periods.

COMMISSIONER BARAN: Okay.

And, this is probably a question for you, Pat. In some of the other -- in the Summer combined license application and North Anna early site permit, there, one of the alternate sites they considered was Savannah River.

And, that site would, at least, I don't know how outdated that is and whether it factored in the 2007 drought, at least, for those documents, at the time, the impacts were going to be small rather than moderate as they are here. And, it's not clear that you have needed a third make-up pond.

Do you -- when you look at alternate sites, do you just look at the sites identified by the Applicant in the Environmental Report or do you consider other sites, for example, like Savannah River that are present and identified in other COLA applications as potential alternate sites?

MS. VOKOUN: I think the short answer is that we start with the Applicant's sites and evaluate those. If we don't necessarily find that they are as stated, then we might go further.

I think Andy Kugler, who is our oncologist specialist can share with more.

MR. KUGLER: Yes, Andy Kugler, and I have been sworn in.

So, the process that we use as described in the Environmental Standard Review Plan is to evaluate the licensees process. How did they go about identifying alternative sites? Was the process logical? Was it not arbitrary in the sense that it would exclude sites without a good reason?

And, so, we review their process and make sure they had a good process. And, if we get to the point where we can conclude they had a good process, at that point then, we take the sites that they ended up with and we perform an independent comparison of just that last group of sites.

So, we don't go out and look separately for other sites as long as we can determine that their process was appropriate.

COMMISSIONER BARAN: Okay.

And, then, I'd just ask one follow up

question to Mr. Snead on that. So, Savannah River isn't in your -- isn't in Duke's service area?

MR. SNEAD: It's not in our region of interest defined for.

COMMISSIONER BARAN: Okay. Would you -- when you're looking at -- when Duke's looking at alternate sites or potential alternate sites, do you -- would you ever consider looking at something outside of your service area or no?

MR. SNEAD: Yes, I believe we would if there was a clear advantage to that -- to us.

COMMISSIONER BARAN: Okay.

MR. SNEAD: I will say, we looked at 23 sites for the Lee application. There were ten in North Carolina and I think 13 in South Carolina before deciding on the four that are described in detail in the final Environmental Impact Statement with the Lee being the preferable site of those four.

COMMISSIONER BARAN: Okay, thank you.

CHAIRMAN BURNS: Thank you, Commissioner.

That concludes our environmental panel. We'll go then to closing statements from the Applicant and the staff. I guess what it will do is maybe take a moment to do the switch out for the staff. I think the Applicant's fine.

And, I guess before we actually -- before we go to the closing statement, I'd just ask my fellow Commissioners, any -- were there any other final questions or clarifications you wanted to make beforehand?

COMMISSIONER SVINICKI: Mr. Chairman?

CHAIRMAN BURNS: Yes?

COMMISSIONER SVINICKI: I would just note that, consistent with our procedure upon review of the transcript, I may have some post-hearing questions --

CHAIRMAN BURNS: Absolutely.

COMMISSIONER SVINICKI: -- that I would submit in writing. So, I just -- I reserve that standard for our process.

CHAIRMAN BURNS: Absolutely.

Okay, we'll proceed then with the closing statement, first by -- from the Applicant, I think Mr. Fallon and Mr. Kitchen may speak. So, please proceed.

MR. FALLOW: Thank you, Mr. Chairman and Commissioners for the time and effort that you put in -- put forth in preparing for and conducting this hearing. We appreciate your insights and questions and we'll ensure that any follow up information you may want is addressed.

I would also like to recognize the work

done by the NRC staff. I believe that this hearing has fully demonstrated the exhaustive review done by the staff and validates the staff's safety and environmental findings.

We certainly agree with the conclusion that the AP1000 is safe. The environmental considerations have been addressed and that the Commission has the information necessary to make the required findings for the issuance of the Lee COL.

I also want to recognize the professionalism and thoroughness of our Duke Energy team in addressing the information needs and the emergent issues required to complete the COLA review.

Our Duke and ENERCON teams have invested over a decade and several hundred thousand man hours to prepare this COL application and to complete the COLA review.

Obtaining the lease COL is key to Duke Energy Carolinas ability to meet generation resource requirements. Our planning identifies the need for over 3,900 megawatts of new generation during the next 15 years. And, we face significant uncertainty regarding the impact of carbon limitations, the generation need and the potential for carbon legislation support the addition of the Lee plant in

the next 10 to 15 years.

A COL minimizes the construction risk and provides us the ability to implement 2,200 megawatts of nuclear generation five to seven years faster than otherwise possible.

These are significant strategic considerations in making a final decision to move forward on a multi-billion dollar mega project.

The company will make a final decision on new nuclear generation in the Carolinas in the future based upon, among other factors, energy needs, project cost, carbon regulation, natural gas prices, existing or future legislative provisions for cost recovery and the requirements of the NRC's combined operating license.

Mr. Chairman and Commissioners, thank you again for your efforts. We welcome any further questions you may have regarding the Lee Unit 1 and Unit 2 combined license application.

CHAIRMAN BURNS: Okay, thank you. Thank you.

Then, for the staff?

MS. ORDAZ: Thank you, Chairman Burn.

Again, my name is Vonna Ordaz. I'm the Deputy Director for the Office of New Reactors.

With me on this panel are Frank Akstulewicz, the Director of the Division of New Reactor Licensing and Sam Lee, the Acting Deputy Director for the Division of New Reactor Licensing.

Again, we thank you for the opportunity to speak today. In the staff's paper to the Commission pertaining to this mandatory hearing, the staff's final Safety Evaluation Report and final Environment Impact Statement and our presentations to you during this hearing, we have provided an adequate basis for making the necessary findings set forth in 10 CFR 52.97 and 10 CFR 51.107 to support the issuance of the combined licenses for William States Lee, III Nuclear Station Units 1 and 2.

In this hearing, we have described why the staff's review of the Lee Units 1 and 2 combined license application have been both thorough and complete.

The review was appropriately focused by the finality afforded to issues within the scope of the AP1000 design certification.

The staff has demonstrated the thoroughness of our review, in part, through its reliance on staff guidance and interactions with the ACRS.

The ACRS agrees with the staff's conclusion that the combined licenses for Lee Units 1 and 2 should be issued.

Today, we highlighted certain aspects of our safety and environmental reviews. We explained the staff's evaluation of the site foundation response spectra and the emergency operations facility.

During the staff's environmental panel, we discussed the creation of Make-Up Pond C. We also highlighted our process for compliance with the NRC's National Environmental Policy Act regulations specified in 10 CFR Part 51, and other applicable environmental statutes and appropriate interactions with other government agencies and the public.

We are similarly confident that, through the ITAAC process, the construction reactor oversight process, inspections of construction activities, inspections of operational programs and oversight of the transition from construction to operation, we will be able to confirm that the plant has been constructed and will operate in conformance with the licenses, the Atomic Energy Act and the Commissions regulations.

The Applicant understands the necessity of complying with the requirements and also understands what needs to be done if any noncompliance is

discovered, including determining the safety significance, determining operability, determining the extent of condition and taking prompt corrective action to restore compliance.

In those instances in which we relied on commitments, we have done so in accordance with the Commission's commitment policies and practices by which the licensee -- oops -- we have verified that there is an established process by which the licensee maintains commitments and implements changes. And, we, of course, oversee those changes if any are made.

The staff appreciates the opportunity to present to the Commission today the results of our thorough and complete review.

And, this concludes the staff's presentation.

Thank you.

CHAIRMAN BURNS: Okay, thank you, Vonna, thank you very much.

Now, I'll call on colleagues, if they have any closing statements they would like to make beginning with Commissioner Svinicki.

COMMISSIONER SVINICKI: Thank you, again.

I just want to express my thanks to all of the witnesses who participated today, whether or not

they were called to the table or the microphone.

I think that the responsiveness has been very professional and very thorough today. And, again, it is a testament to the very diligent preparation by the Applicant in terms of the application and the thoroughness of the NRC staff's review.

Of course, it's very visible the many NRC experts, not only from the New Reactors Office, but from other organizations who participate in getting us to where we are today.

I just would like, in closing, to also acknowledge the other offices that are essential to the conduct of a hearing such as today's and that very directly support the Commission. That would be the Office of the Secretary, the Office of Commission Appellate Adjudication and the Office of General Counsel.

And, finally, just of note, I want to call out, because I often fail to do so, the Agency's administrative professionals without whom we would not have the orderly conduct and flow of business throughout this Agency. So, I just want to note that they are absolutely essential to the completion of a significant review such as this.

And, as I noted, I may have some post-hearing questions after I've studied the transcript and the responses. But, other than that, I just thank everyone who was here today.

CHAIRMAN BURNS: Thank you.

Commissioner Baran?

COMMISSIONER BARAN: Well, I'll just add my thanks to the NRC staff and all of today's participants for your hard work throughout the review of this application and for your thorough preparation for today's hearing. I found it to be very informative. Thank you.

CHAIRMAN BURNS: Thank you. And, I'll just, I'll add my thanks as well. As my colleagues have noted, there are a number of disciplines, both administrative, technical and legal, that contribute to these proceedings from both -- from the NRC staff side, but also from the Applicant's side.

And, we appreciate the hard work and thoughtfulness that has gone into their presentations here today, but also into the more voluminous record that is created for this hearing.

We've also heard today, too, the intersection between our responsibilities and those of other federal agencies, United States Army Corps of

Engineers, the Fish and Wildlife Service, the Department of Homeland Security and their contributions are also important to the decision making record and the findings that we have to make primarily under the Atomic Energy Act and the National Environmental Policy Act, but other pieces of legislation that have come over the years that give those agencies some responsibility or consultative obligations with our Agency.

So, I want to extend my appreciation to them, though most of them are not here in the room, but I think we'll -- they hear back. It'll be -- yes, that's, Commissioner, it'll be in the record.

So, I'll leave with that and I will proceed to where I began which is with some statements about what the next steps are.

And, the instructions I will have that I announce here today will be confirmed in subsequent orders issued by the Secretary.

First, as Commissioner Svinicki noted, she or Commissioner Baran or I might have some post-hearing questions. The deadline we expect for responses to any post-hearing questions will be October 20th, 2016, unless we direct otherwise.

The Secretary plans to issue an order with

post-hearing questions, if any, by October 12th, 2016.

And, then, also, an important step is for the parties to look at the transcript of today's proceedings and provide any corrections. And, it's really, it's in the nature of corrections, not substantive -- so much substantive additions.

But, the deadline for transcript corrections will be October 17th, 2016 and the Secretary, I expect, will issue an order requesting transcript corrections by October 11th, 2016.

As I mentioned this morning, the Commission expects to issue a final decision promptly on the record before us with due regard to the complexity of the issues that we have faced today and that are in the record before us.

Again, thanks for being here and thanks for your presentations. We are adjourned.

(Whereupon, the above-entitled matter went off the record at 2:09 p.m.)

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
DUKE ENERGY CAROLINAS, LLC	)	Docket Nos. 52-018-COL
	)	52-019-COL
(William States Lee III Nuclear Station Units 1 and 2)	)	
	)	
(Mandatory Hearing)	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing **ORDER (Setting Deadline for Proposed Transcript Corrections)** have been served upon the following persons by Electronic Information Exchange.

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[Original signed by Herald M. Speiser]
Office of the Secretary of the Commission

Dated at Rockville, Maryland,
this 11th day of October, 2016