UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of DUKE ENERGY FLORIDA, LLC (Levy Nuclear Plant, Units 1 and 2)	Docket No. 52-029-COL Docket No. 52-030-COL

ORDER
(Setting Deadline for Proposed Transcript Corrections)

The Commission held an evidentiary hearing on July 28, 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 August 9, 2016. 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 2nd day of August, 2016.

Official Transcript of Proceedings

NUCLEAR REGULATORY COMMISSION

Title: Hearing on Combined Licenses for Levy Nuclear Plant Units 1 and 2: Section 189(a) of the Atomic Energy Act

Docket Number: (n/a)

Location: Rockville, Maryland

Date: Thursday, July 28, 2016

Work Order No.: NRC-2516 Pages 1-161

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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HEARING ON COMBINED LICENSES FOR LEVY NUCLEAR PLANT UNITS 1 AND 2: SECTION 189(a) OF THE ATOMIC ENERGY ACT

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THURSDAY,

JULY 28, 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 9:03 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

PATRICK A. MOULDING, Assistant General Counsel, Office of General Counsel

NRC AND LICENSEE ATTORNEYS:

DAVID R. LEWIS, Counsel for Duke Energy Florida

KEVIN C. ROACH, NRC Office of General Counsel

LICENSEE WITNESSES:

JOHN FALLON, Director, Engineering Nuclear Development, Duke Energy

ROBERT KITCHEN, Director, Engineering nuclear Development, Duke Energy

ANAND K. SINGH, Technical Expert, Sargent & Lundy

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

LORIN YOUNG, Environmental Consultant, CH2M Hill

NRC WITNESSES:

FRANK AKSTULEWICZ, Director, DNRL, NRO

DAN BARSS, NSIR

DONALD HABIB, Project Manager, NRO

ANDREW KUGLER, Senior Project Manager, NRO

RONALD LAVERA, NRO

SAMUEL LEE, Acting Deputy Director, DNLR, NRO

GERRY STIREWALT, Senior Geologist, NRO

MALLECIA SUTTON, Project Manager, NRO

VAUGHN THOMAS, Structural Engineer, NRO

BOYCE TRAVIS, Reactor Systems Engineer, NRO

JENNIFER UHLE, Director, NRO

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P R O C E E D I N G S

9:03 a.m.

CHAIRMAN BURNS: I'll call this hearing to order. The purpose of today's hearing is to hear from the Applicant and from the NRC Staff on the Combined License Application for the Levy Nuclear Plant Units 1 and 2. This is a proceeding under Section 189(a) of the Atomic Energy Act. I want to welcome Duke Energy Florida, Staff, members of the public, and all those who may be observing our hearing today remotely. Again, the hearing is required under Section 189(a) of the Atomic Energy Act. The Commission will also be reviewing the adequacy of the Staff's environmental impact analysis per the National Environmental Policy Act of 1969, which everyone commonly refers to as NEPA.

And the order of, to explain the general order of the hearing, Duke and Staff will provide testimony and witness panels that will provide an overview of the Application, as well as address highlighted safety and environmental issues associated with the review. And the Commission questions will follow each panel. After the hearing, the Commission expects to issue a decision promptly with due regard to the complexity of the issues before it and it will

-- after it makes the following necessary findings.

With respect to safety matters, the Commission will determine, one, whether the applicable standards and requirements of the Atomic Energy Act and the Commission's regulations, particularly those in 10 CFR 52.97 have been met, whether any required notifications to other agencies or bodies have been duly made, whether there is reasonable assurance that the facility will be constructed and will operate in conformity with the provisions of the Atomic Energy Act and the Commission's regulations, whether the Applicant is technically and financially qualified to engage in the activities authorized under the license, and whether the issuance of the license would be inimical to the common defense and security or the health and safety of the public.

With respect to environmental matters, under 10 CFR 51.107(a), the Commission will determine whether the requirements of the National Environmental Policy Act Section 102(2)(a), (c), and (e), and the applicable regulations in 10 CFR 51 have been met. I'm going to test you all to see whether you remember those sections later.

(Laughter.)

CHAIRMAN BURNS: Independently, the

Commission will 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. Three, 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 determine whether the need for 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. If a party believes that a response to a question may require reference to non-public information, then that party should answer the question to the extent practicable with information in the publicly available record and file any non-public response promptly after the hearing on the non-public document. And presumably we will give instructions on that if we face that situation. Before we proceed with other procedural matters, I would ask my fellow Commissioners whether they have any other opening remarks. Commission Svinicki?

COMMISSIONER SVINICKI: Yes, thank you, Mr.

Chairman, for that context and explanation of what we're engaged in today. There is also a tremendous amount of development review and analysis that has occurred by both the Applicant and the Staff leading up to today. So, I welcome the Applicant to engage in the defense of their Application and I thank the Staff for all of their hard work and look forward to today's review. Thank you.

CHAIRMAN BURNS: Thank you, Commissioner. Commissioner Baran?

COMMISSIONER BARAN: Thanks, Mr. Chairman. Well, this is my fourth uncontested hearing that I've participated in, but my first involving the AP1000 reactor design. These hearings play an important role in the Agency's process for determining whether to issue a combined license. I thought that the prior hearings went very smoothly and I found them to be very valuable and I anticipate that today's hearing will be just as informative. I look forward to your presentations and responses to our questions. Thank you.

CHAIRMAN BURNS: Thank you, Commissioners. With that, we'll proceed with some of the other procedural matters, that is the swearing in of witnesses and admission of documents that have been

identified by both the Staff and by the Applicant. And I presume there are a lot of people in this room who are witnesses, so I will provide you instructions as how to go as we proceed to swear you in. But first, I'm going to ask counsel for Duke to introduce himself.

MR. LEWIS: Thank you. My name is David Lewis, I'm with the law firm of Pillsbury, Winthrop, Shaw, Pittman, and I have the privilege of representing Duke.

CHAIRMAN BURNS: Okay. Thank you, Mr. Lewis. What I'd ask you to do now is to read the names of your witnesses and when the witness hears his or her name called, I would ask you to stand.

MR. LEWIS: Duke Energy's witnesses are Mr. Christopher Fallon, Mr. Robert Kitchen, Mr. John Thrasher, Mr. Lawrence Taylor, Mr. Paul Snead, Dr. A.K. Singh, and Mr. Lorin Young.

CHAIRMAN BURNS: Okay. Thank you, gentlemen. I'm going to ask you to raise your right hand and then repeat after me the oath. Do you swear or affirm the testimony you will provide in this proceeding is the truth, the whole truth, and nothing but the truth?

(Witnesses sworn.)

CHAIRMAN BURNS: Thank you. Are there any objections, counsel, to including the witness list into the record?

MR. ROACH: No objections.

CHAIRMAN BURNS: Okay. Then the witness list is admitted into the record.

(Whereupon, the above-referred to document was received into evidence.)

CHAIRMAN BURNS: Gentlemen, you may sit down. Second, with respect to admission of evidence, I'm going to ask counsel for Duke whether there are any changes to the exhibit list for the Applicant.

MR. LEWIS: There are no changes.

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

MR. LEWIS: Yes. Duke Energy's exhibits are number DEF-001 through DEF-012.

CHAIRMAN BURNS: Okay. Is there a motion to admit those exhibits into the record?

MR. LEWIS: Yes, we --

CHAIRMAN BURNS: Is there any objection?

MR. ROACH: No objection.

CHAIRMAN BURNS: Okay. Absent any objection, the exhibits and the exhibit lists are

admitted into the record.

(Whereupon, the above-referred to documents were received into evidence.)

CHAIRMAN BURNS: At this point, we'll also then swear in the witnesses for the NRC Staff. Counsel, would you introduce yourself?

MR. ROACH: Good morning. My name is Kevin Roach, counsel for the NRC Staff.

CHAIRMAN BURNS: Again, what I'd ask you to do is read the name of the witnesses for the Staff and as each witness is named, please stand. And if you cannot see me, I would ask you to move to a point in the room where I can actually have eye contact with you because I realize there are some folks who are behind the pillars in the room. So, counsel -- and I would ask the witness to stand and remain standing until we administer the oath. So, counsel, you may proceed.

MR. LEWIS: I would just note that from the last witness list that the Staff filed on July 22, there are four witnesses that will not be present, Andy Campbell, Paul Harris, Yiu Law, and Wendell Morton. So with that, I'll begin with the safety witnesses, Frank Akstulewicz, Dennis Andrukat, Clinton Ashley, Dan Barss, Anthony Bowers, Robert Caldwell,

Michael Cheok, David Curtis, Stephanie Devlin-Gils, Jennifer Dixon-Herrity, Steven Downey, James Downs, Timothy Drzewiecki, Scott Flanders, John Frost, Greg Galletti, Anne-Marie Grady, Vladimir Graizer, Donald Habib, Charles Harbuck, Michelle Hart, Shawn Harwell, Raul Hernandez, Charles Hinson, Kaihwa Hsu, Joel Jenkins, Henry Jones, Rebecca Karas, James Kellum, Edmund Kleed, Ronald LaVera, Samuel Lee, Renee Le, Kosmas Lois, John Lubinski, Timothy Lupold, Michael McCoppin, Matthew Mitchell, John Monninger, Charles Murray, Eric Olvera, Vonna Ordaz, Pravin Patel, Malcolm Patterson, Thomas Pham, Paul Pieringer, Meralis Plaza-Toledo, Marie Pohida, Sheila Ray, Richardo Rodriguez, John Rycyna, Sujit Samaddar, Cayetano Santos, Eduardo Sastre-Fuentes, Thomas Scarbrough, John Segala, Gerry Stirewalt, Angelo Stubbs, Edward Stutzcage, Frank Talbot, Rao Tammara, Albert Tardiff, Vaughn Thomas, Nebiyo Tiruneh, Boyce Travis, Tung Truong, Richard Turtil, Jennifer Uhle, Christopher Van Wert, Duncan White, Yuken Wong, Zuhan Xi, Jack Zhao.

CHAIRMAN BURNS: That it?

MR. ROACH: We have environmental witnesses as well.

CHAIRMAN BURNS: Oh, okay.

(Laughter.)

MR. ROACH: Dan Barnhurst, Jack Cushing, Jennifer Davis, Peyton Doub, Allen Fetter, Mohammed Haque, Stacey Imboden, Andrew Kugler, Michael Masnik, Daniel Mussatti, Donald Palmrose, Kevin Quinlan, and Mallecia Sutton.

CHAIRMAN BURNS: Okay. I think everybody can see me, so I'm going to ask the witnesses then to raise their right hand and respond to the oath. Do you swear or affirm that the testimony you will provide in this proceeding will be the truth, the whole truth, and nothing but the truth?

(Witnesses sworn.)

CHAIRMAN BURNS: Okay. You may be seated. Are there any objections to including the witness --

MR. LEWIS: No objection.

CHAIRMAN BURNS: -- list into the record? Thank you. So the witness list, with those amendments that Mr. Roach noted is admitted into the record.

(Whereupon, the above-referred to document was received into evidence.)

CHAIRMAN BURNS: I'll proceed to the admission of the Staff evidence. Are there any changes to the exhibit list?

MR. ROACH: None since we filed our

reviewed list on July 26.

CHAIRMAN BURNS: Okay. Would you read, counsel, the range of numbers of the exhibits to be admitted?

MR. ROACH: NRC-001 through NRC-012.

CHAIRMAN BURNS: Okay. And you move to admit those exhibits into the record?

MR. ROACH: We do so move.

CHAIRMAN BURNS: Are there any objections?

MR. LEWIS: No objections.

CHAIRMAN BURNS: Okay. In the absence of any objections, the exhibits and the exhibit list are admitted into the record.

(Whereupon, the above-referred to documents were received into evidence.)

CHAIRMAN BURNS: And I think that takes care of the preliminaries. We have the admission of the witnesses who can testify. What I would note is, on occasion in the past proceedings we have had sometimes one of the parties call upon a witness or would like to call upon a witness who has not been admitted or has not taken the oath at that point. Certainly that may happen, if that's the case, what I would ask, and for any witness that comes up to the podium, as opposed to being seated in front of us,

please wait to be recognized by me. I will ask you whether you've taken the oath and if you have not, I will administer the oath at that time.

We'll begin then, I think, with our overview panel to begin with the -- yes, the overview panel from Duke. And I'll let you introduce yourselves. And, again, what I would advise the witnesses is they should assume that the Commission is familiar with their prehearing filings. And I'll give counsel an opportunity to move out of the way to wherever we have you seated while the proceedings are going on. So, again, the first two panels will be overview panels, first from the Applicant, Duke, and then by the Staff. Again, you can -- the witnesses should assume that the Commission is familiar with the prehearing filings before us. Again, I will ask you to introduce yourselves, beginning with you, Mr. Fallon.

MR. FALLON: Chris Fallon, Vice President of Nuclear Development for Duke Energy.

MR. KITCHEN: Bob Kitchen, Director of Licensing, Duke Energy.

MR. SNEAD: Paul Snead, Manager, Siting and Licensing Support, Duke Energy.

CHAIRMAN BURNS: Okay. And you may

proceed.

MR. FALLON: Thank you and good morning, Commissioners. We're very pleased to be here. On behalf of Duke Energy, on behalf of the employees and customers of Duke Energy, we would like to begin 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.

As you are well aware, the work required to get to this hearing is very challenging and we are pleased to have the opportunity to discuss our Levy COP Application with you. The development of the Levy COLA has presented some unique challenges and learning experiences for us in applying the Part 52 licensing process. Our presentations today will focus on the safety and environmental aspects that are unique to Levy or those issues that have required evaluation beyond what you've reviewed in previous mandatory hearings.

Let me start by telling you about Duke Energy and our capabilities to own and operate a nuclear power plant. Duke Energy has been in service

for over 150 years. Duke Energy, we have over 7.4 million customers, $121 billion in assets, and our market capitalization is approximately $60 billion. In addition to the financial resources to own a nuclear power plant, Duke Energy has the experience and skilled professionals to safely and efficiently operate nuclear power plants.

Duke Energy is one of the largest nuclear operators in the country, with 11 units at six sites. Duke Energy has successful experience in the construction of nuclear plants and has been safely operating nuclear plants for over 45 years. All told, Duke Energy has over 445 reactor years of operating experience. Our Nuclear Generation Organization has over 6,600 highly trained nuclear professionals. Duke Energy has achieved consistently high nuclear fleet performance. We have achieved 17 consecutive years with an average fleet capacity factor greater than 90 percent and an excellent track record in personnel, nuclear plant, and radiation safety.

Nuclear energy is very important to Duke Energy. Duke Energy's customers and the communities we serve have benefitted greatly from the Duke Energy nuclear fleet. Duke electric rates are 20 to 30 percent below regional and national averages. Much of

this is attributed to the investment in nuclear and our excellent track record and performance. As such, the Levy COL is an important asset to Duke Energy and its customers.

We chose nuclear over other energy alternatives based on several considerations. First of all is cost. History has shown that nuclear energy is competitive with other base load options when evaluated over its 40 year design life. Second is fuel diversity. Duke Energy currently has no nuclear generation in the state of Florida. In addition to the obvious need for diversity in generation resources, we also face increasing requirements to reduce greenhouse gas emissions. Carbon free nuclear generation cannot be ignored in plans to achieve further reduction in CO2 emissions.

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 PWR technology. Additionally, we found the AP1000's passive safety features to be very attractive. Finally, the opportunity to collaborate with other utilities in the Southeast who have chose and are constructing the same

AP1000 design offers significant advantages and we have benefitted from this collaboration.

We chose the Levy site after a comprehensive evaluation of alternative sites, followed by extensive site characterization. The site has excellent margin to withstand external hazards, has been approved by the State, and is found to be the least environmentally damaging practicable alternative by the Army Corps of Engineers. Our final safety analysis report and the NRC Staff 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 decision to build, the ability to add emission free nuclear generation in Florida is an important element of our integrated resource planning. Our Integrated Resource Plan, which is updated annually and filed with the Florida Public Service Commission, fully supports the need for base load power. In addition to the ongoing demand in energy growth, Duke Energy Florida

recognized the potential for unit retirement in the next ten to 20 years. These retirements will be driven by a combination of unit age and future regulation, particularly, the implementation of future carbon constraints. This will create further need for the new base load generation that could be met by the Levy 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 Levy project a success. Our staff of proven nuclear professionals will ensure safe, reliable, economic, and environmentally sound operation of the Levy Plant. Thank you for your time and attention and we look forward to discussing our COL Application with you. At this point, I would 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 the licensing of Levy. John Thrasher has worked for Duke Energy for 38 years with experience in design and plant engineering. He is responsible for the engineering support of the Levy

project. Paul Snead has worked for Duke for 38 years with experience in radiation protection and environmental support of plant operation. He is responsible for the environment support for Levy license and permitting. Larry Taylor has worked for Duke for 31 years and has significant experience as a PWR Senior Reactor Operator and Shift Technical Advisor.

Dr. A.K. Singh has worked for Sargent and Lundy for over 40 years providing design, engineering, and licensing support to nuclear utilities. Dr. Singh is an expert in structural and earthquake engineering and provided direct support for the Levy COLA development and review. Lorin Young worked with CH2M Hill and has over 20 years of experience in environmental support. Mr. Young managed the environmental fieldwork and the analysis required for the Levy site characterization. At this point, I'd like to turn it over to Bob Kitchen, who will now provide an overview of the Levy site and licensing activity.

MR. KITCHEN: Thank you, Chris. Good morning, Commissioners. Paul Snead and I have planned to provide some background for you about the site itself. We're going to talk a little bit about our

service territory, the area that we serve, and our expectations there. Just a bit on the COLA structure and how we've gone about putting that document together. We're going to talk some about emergent issues, of course we'll discuss that more when we get to the safety panel or some items that the Commission has indicated interest in. And Paul will give us an environmental summary of impacts that we anticipate at the Levy site. Next slide, please.

The slide that we have up here shows the service territory. As you can see, we serve Central and Western Florida. We currently have about 1.7 million customers. And like the rest of the country, we had a bit of a downturn in growth with the recession. We have begun to see that turn. Mostly recently, we're seeing growth rates of about 1.3 percent in load growth and we anticipate about 1.5 percent growth per year over the next ten years. So, as Chris mentioned, we have a need for base load power that could be met by Levy.

As you can see from the map there, the Levy Plant site is centrally located in our service territory and positioned about 90 miles to the north of St. Petersburg, Florida. Next slide, please. This map shows a little closer view of the site area. The

lower right corner is a map of Florida, the red area there indicates the area of the map that's magnified on part of the slide. The Levy site itself is shown in the left center of the graph there, of the slide.

The Levy site is about nine and a half miles to the northeast of the Crystal River Energy Center that you can see on the coast on the left lower corner and we're about eight miles inland from the Gulf of Mexico. The site itself is about 3,100 acres, but we also own an additional 2,000 acres adjacent to the 3,100 acre Levy site, which provides us opportunity should we want to expand other energy sources in that area. A couple of features to point out. In the center of the slide there, you see the Cross-Florida Barge Canal.

The Cross-Florida Barge Canal is located about three miles to the south of the Levy site. It's an interesting project. That was a Corps of Engineers project started in the 1960s and the intent was to run a barge canal across the state of Florida from the Gulf of Mexico to the Atlantic to provide commercial traffic capability. And it was actually started, you can see it went as far as Lake Rousseau. The project was stopped due to concerns about environmental impacts, specifically on the watershed here in

Florida. And it was cancelled ultimately in 1971.

The reason I point out the Barge Canal is we plan to make use of that Barge Canal for Levy. Ultimately, our cooling water source is the Gulf of Mexico, but our actual intake will be located on this Barge Canal. The other purpose that we plan to make with the Barge Canal is for traffic, shipment of large components, modules, et cetera, that we can bring in by barge on this Barge Canal to a barge slip that we're going to install near Lake Rousseau and then be able to haul these components by heavy haul road up to the site three miles to the north.

One thing that is a bit different about Levy, we don't have rail access to the site. We looked at doing that originally and it just became more difficult and we didn't think it was necessary with the Barge Canal access. So that's a difference that you see in Levy than what you've seen on others. The other thing I want to point out, if I could have the map back up so you can see, we're going to run the cooling water, cooling tower blowdown from the Levy site down to the Crystal River Energy Site. So that's a distance of about 13 miles and you might question why we did that.

Originally, we looked at the discharge

from the plant going to the Gulf of Mexico straight across and the more we looked at that, there were significant environmental impacts, particularly there's a sea grass preserve directly to the west of the Levy site, that bay area you see there is an environmentally preserved area. So it was certainly undesirable for that reason and probably enough based on that. The other concern is that the cost would be considerable because of the shallowness of the Gulf of Mexico and the distance that we would have to route piping for that to work. So we made a decision to go to the Crystal River Energy Complex and use the existing discharge canal that's there for the other power plants. Next slide, please.

This slide shows, this aerial view shows the site itself. This view is particularly looking towards the west or towards the Gulf. I put this in here just so you get a feel for what the site looks like. It is a greenfield site, but as you can see, it's not -- it has been disturbed, it's not a pristine site. In fact, this site has been used for over 100 years for pine tree plantations to support the pulp paper industry. And if you look closely at that photograph, you can see furrows where pine trees were planted. So the site has been disturbed and was

active used for silver culture when we purchased the property.

We sited the Unit 1 and 2 -- Unit 1 would be to the left, right in the center of the photograph there. We sited Unit 1 and 2 for two, based on two things. Our preliminary geologic investigations indicated that the rock layer was a little more shallow to the north, so we tended to weight the siting to the northern area of the property. But we also wanted to preserve space should we elect to build additional power plants in this area. So that kind of based our location for the two sites that you can see here.

The other thing I'll mention, the roads you see here, we didn't -- these are logging roads that were in existence when we purchased the property. So it's pretty much the way it looked at purchase. Next slide, please. This view shows the Barge Canal that I mentioned. This is looking straight up the Barge Canal toward the Gulf of Mexico, it's eight miles to the distance -- it's on the horizon there. The other thing that's interesting about this photograph is in the upper left corner, you can see the Crystal River Energy Complex, you can see the vapor plume from one of the cooling towers at a fossil

plant there.

The Barge Canal, as I mentioned, in the lower section there, you see the lock which exists between the canal and Lake Rousseau. That lock is no longer used. As I mentioned, the Canal is really just for recreation use now, so that lock is no longer in use, but it separates Lake Rousseau from the Canal. Our intent is to put an intake structure for service water cooling tower makeup as shown here on the Canal. Just to the west of that, we plan to install a barge slip, which we have an environmental permit to do. That barge slip will allow us to bring in the shipments that I mentioned earlier.

The other thing that's not shown here is that we'll put in a heavy haul road, it's basically a reinforced road that would be able to handle the extreme weights and loads that we would want to ship with modules and other large components that would come in here and then be transported about three miles up. Next slide, please. This is the Crystal River Energy Complex that I've mentioned. Crystal River Energy Complex originally sited five plants, Crystal River 1 through 5, and it was about 3,000 megawatts total power from the site.

During the period of time that we've been

working on the Levy Application, there have been some changes. Most notably, and I'm sure you're aware, the Crystal River 3, which is our nuclear plant, permanently ceased operation and is now in decommissioning. There are four fossil plants remaining. Currently, we have a combined cycle gas generation unit that's being built adjacent and upon completion of that generation, the Crystal River 1 and 2, which are fossil plants, will be removed from service too because of the difficulty meeting air emission standards. So the net effect of Crystal River 1, 2, and 3 going away and the replacement with the combined cycle gas generation is the net generation output from the site basically remains constant.

The other thing then, the real interest that the Staff has on this site and you would have is that, as I mentioned, we plan to use the discharge canal. The discharge canal is the one shown on the right in the photograph. We plan to use the discharge canal for the Levy blowdown. The Crystal River 1, 2, and 3 were once through cooling, so they used the intake canal once through the condensers and then discharged to the discharge. Crystal 4 and 5 is a cooling tower.

So one of the impacts that we had to assess when the decision was announced to decommission Crystal River 3 was to look at the impact that a blowdown from Levy would have on that discharge canal. Specifically, we looked at salinity impacts, radiation effluent impacts, and thermal plume. And we assessed those for the Crystal River 3 decommissioning. We also assessed it for further reduction in flow with Crystal River 1 and 2. There will be some flow maintained through this canal even after removal of those units from service. Next slide, please.

Our Levy Application, like the others that have been presented here, AP1000, they are based on Part 52, of course, it's a Combined License Application. We submitted the Application in July 2008. And our Application, as you've seen with Vogtle and V.C. Summer, incorporates the AP1000 Design Control Document Revision 19, which is the Certified AP1000 Design. And as the others, we have adopted the Reference COL approach that the Staff and the Commission have endorsed in the Regulatory Issue Summary of 2006. The objective here is one issue, one review, one solution.

So, in that light, our Application that you have reviewed mirrors what you have seen in Vogtle

and V.C. Summer where it could be standard. The only place we deviate from standard text is site specific requirements or some of the issues that we've talked about. There have been, as we've gone through detailed design for the AP1000, there have been some issues that we have incorporated into our Application. So, of course, that is a deviation from standard text. But otherwise, our COLA -- I mean, our COLA structure is the same as the previous AP1000s. In going through this COLA, both Duke Energy and the Staff have done a thorough review of the design and site characteristics to ensure that we met requirements. Next page.

Emergent issues. One of the different things with Levy, we've had to deal with emergent issues. The ones that I'm talking about specifically are related to AP1000 design. As the AP1000 has progressed from a Certified Design to an actual design in construction, the lead plants, primarily the Vogtle and V.C. Summer plants, but to some extent the China plants, have identified changes that need to be made. And we've reviewed all the changes, we review the design changes and license change packages that are prepared to support those license holders to identify changes that we felt needed to be incorporated into the License Application.

To do that, we used the NRC Interim Staff Guidance 11, which identifies items that, if they're identified after a "design freeze" would still need to be reported to the Staff so they could consider prior to the issuance of the Final Safety Evaluation Report. The specific issues that we've identified, and there are five, resulting from design, are shown here. Condensate return design change, which we'll talk more about in the safety panel. Main control room dose was a change we incorporated to be able to ensure that the main control room operator dose was maintained below the GDC 19 requirement of five rem in accident scenarios.

Main control room heatup was a change to ensure the operator environment was suitable for good human performance and also equipment qualification requirements. Combustible gas control containment was a change to ensure that the structural integrity of containment was maintained following a hydrogen burn after an accident and that the ITAAC correctly reflected the results of that analysis. And then, the last one, the source range, neutron flux doubling to make sure that we met the requirements of IEEE-603, which was a Part 50 requirement.

So these are the issues that we've

identified from the design. And these are the current, I think, in the AP1000 reality, this is the only design that's in active construction and so, you would expect as you go through design work, things will be identified. In addition to the design emergent issues, of course an emergent issue that Levy's dealt with that's very significant is the Fukushima response. Most significantly looking at seismic, but also considering flooding. If you'll go to the next slide?

I put this slide in here just to show the large margin that we have with our seismic design. The upper graph, the red curve is the certified seismic design response spectrum for the AP1000. The blue curve, and there are two, the blue curve is the site response for Levy. The reason there are two is one is prior to the Central Eastern U.S. Update and the other is following the Central Eastern U.S. Update. So the point I get from this picture is two, there's a lot of margin at Levy on seismic and, secondly, the implementation of Central Eastern U.S. have little impact on the results. So the seismic, we're very comfortable with the seismic capabilities of the design and with what to expect at the site.

The other consideration of concern from

Fukushima, of course, was flooding and the new plant flooding analyses met the Staff and regulator expectations for that. But I will say that in terms of the tsunami, that we have a huge margin at Levy in terms of the tsunami expert. Given a low seismic area, you wouldn't expect a lot of vulnerability there and our analysis shows that. The next slide, please. Paul will discuss environmental impacts.

MR. SNEAD: Thank you, Bob. Duke Energy, in our Application, and the NRC Staff have done a very thorough review and analysis of potential environmental impacts. Both the environmental report and the final environmental impact statement determined small to moderate impacts, other than a large positive economic benefit for Levy County. There was a robust site selection process that was followed and the Final Environmental Impact Statement determined that there was no obviously superior alternative site to the Levy site.

In the state of Florida, we have the Florida Power Plant Siting Act, which requires the State to certify any proposed power plant. We received the site certification for the Levy site from the State of Florida in August 2009. That certification included with it the 401 Water Quality

Certification and the Coastal Zone Management Act Certification. It's of interest to note that the environmental report which was prepared as part of the COLA and that application was also used with the site certification application with the State of Florida and the same information was reviewed by the State in that process. The last bullet on the slide notes that the Army Corps of Engineers 404 Permit was issued in December 2015, which completed an extensive review by the Corps of our mitigation plans associated with wetland impacts for the project. And, Bob, I think that concludes our --

MR. KITCHEN: Next slide, please. That does conclude our presentation. In summary, I will say that I think we feel that the Levy site is an excellent location for power. It provides good access. As I've shown, it's for us centrally located in our service area. And we think the site has good properties for the AP1000 design. It's fully bounded by the AP1000 parameters, so in terms of that, the envelope fits well. And as I show, we have a large margin to seismic requirements at the Levy site.

The other thing just in summary, the emergent design issues have been thoroughly reviewed and analyzed and we've concluded and the Staff agrees

that they've been appropriately addressed. And as you can see and Paul just discussed, environmental considerations have been addressed and permits required for construction have been issued. That concludes our overview.

CHAIRMAN BURNS: Well, thank you very much for the testimony. Just to explain before we begin with the questioning, we'll have Commissioner questions after each of the overview panels and then we'll have in the subsequent sessions, the safety panel and the environment panel, both the Applicant and the Staff will testify and then it will be followed by an opportunity for Commission questions. And generally, while the Commissioners have an opportunity to, if you will, bank their time as they see fit to focus on particular questions. And we will also rotate the order of questioning during the day.

To start off, I start off the first set of the questions with the overview. I just had a couple questions in this area. I mean, one of -- this is not unusual, I think the last, one of the last hearings, the last one or two hearings we've had on COLs for South Texas and Fermi have also been instances in which there's a, what I'll call a deferred decision to whether to actually begin construction or proceed with

actions under the license to construct and, obviously, move toward operation. And one of the findings the Commission has to make to issue a combined license is that the Applicant is technically qualified to engage in the activities authorized, which include both the construction and operation of the facility.

Right now, as you've indicated, there is not a particular plan or commitment to build Levy Units 1 and 2, how would you -- one of my questions would be, how -- will you explain the process would work if Duke does not expect a decision to actually construct Units 1 and 2 until several years down the road? And particularly I'm interested in what do you do to ensure knowledge management for a possible future constructor to ensure that they are technically qualified to do so?

MR. KITCHEN: Well, there's several things in that. We have, obviously, an organization in place consisting of engineering and licensing and operations experienced personnel to support the license maintenance. We actually have a very detailed plan in place that we've developed that describes what actions are required and what our plans are moving forward to update the license. As we mentioned in the overview, we have the advantage, sometimes it feels like a

disadvantage, but the advantage is truly there for the plants under construction, completing the design.

We know we have a number of license amendments and departures that we'll need to implement. We've been tracking those very closely and we have a detailed database that tracks the sequence that those were completed and what those changes were and the impacts they have on our license. We also have databases in place that have captured all licensing actions. I'm not talking just ITAAC and license conditions, those are certainly in there, but we have all of the statements that are commitments in the FSAR and, for that matter, the DCD captured in the database, which is several thousand items per unit that we need to implement.

And those are categorized by milestone. So we know that these are activities we need to do prior to construction or prior to the start of a particular activity, and all those are loaded in. So with those things in place, we certainly have a good base for knowledge transfer and we plan to implement that. The other thing, we just recently responded to the Regulatory Issue Summary, literally just last week to the Staff, 2016, I think it's 08, on what are the plans going forward for the next three years. And

that's really for resource planning, but there is that that indicates to the Staff and we have discussed that with them as well.

And I guess the final thing I would say is that Duke, as Chris outlined, we have a significant history in nuclear. We also -- Duke has a, at least from my background, that not all utilities do construct themselves, engineer and construct, and Duke has done that. So we have a good experience base within the company of what it takes to plan, design, and construct and operate.

CHAIRMAN BURNS: Great. Thank you. Mr. Snead, one of the -- in touching on the other types of permits that you have, you have touch on the Florida permits that you're required to have, is there a particular duration for those permits?

MR. SNEAD: No. The site certification is valid for the life of the project, unless we go in and had to modify the certifications for some reason, and then it would be modified. But it's good for the life of the project.

CHAIRMAN BURNS: Okay. Thank you. One other question, this is perhaps more a detail question on the site itself, the Canal, I forget what the name of the Canal is, but this Canal that started and

stopped at the Lake --

COMMISSIONER SVINICKI: Cross-Florida Barge Canal.

CHAIRMAN BURNS: The Cross-Florida Barge Canal, thank you, Commissioner. You showed a map of this indicating where the site was, but also indicating other land, is it your property up to the edge of the barge area or is that -- I'm just trying to understand where that --

MR. SNEAD: I can answer that, Commissioner. Basically, we own all the land south of the Levy project down to County Road 40, which is right parallel to the --

CHAIRMAN BURNS: Okay.

MR. SNEAD: -- Cross-Florida Barge Canal. The actual land immediately surrounding the Cross-Florida Barge Canal is owned by the State of Florida.

CHAIRMAN BURNS: Okay.

MR. SNEAD: It was -- after the cancellation of the project, those lands were deeded by the Federal Government to the State of Florida for the Office of Greenways and Trails. And they've been managing the lands for recreational purposes since that time.

CHAIRMAN BURNS: Okay. And so, as I

understand it, part of -- when you showed the picture of the Canal, one of the things in order to be able to move heavy components, other types of material out, part of that would be building a -- you would be building a road that could have the capacity to take heavy loads across, on into the site. Is that --

MR. SNEAD: Correct. And you see that narrow body of water to the right --

CHAIRMAN BURNS: Right.

MR. SNEAD: -- on the slide there? That's the bypass channel that allows the Withlacoochee River to bypass the lock and continue the river run.

CHAIRMAN BURNS: Oh, okay.

MR. SNEAD: So we would have a bridge across that narrow body of water with that heavy haul road. And the only public road we would have to cross with these construction materials is County Road 40. So it minimizes impacts on traffic for major commodity hauls and things like that.

CHAIRMAN BURNS: Okay. Thank you. My time is up. Commissioner Svinicki?

COMMISSIONER SVINICKI: Thank you, Chairman. I'm just waiting for the clock to be reset since --

CHAIRMAN BURNS: Okay.

COMMISSIONER SVINICKI: -- we're going to be precise today. Thank you. Well, welcome again to Duke, the Applicant. I may be a little unique among Commissioners in that I had the opportunity visit the proposed Levy site. It was eight years ago, so it's been a long road to get to today, as I was mentioning. We had also a chance -- on your Slide 5, you've got the Cross-Florida Barge Canal, as part of my visit with Progress Energy Florida, I guess it was, we drove over to that lock structure and climbed up there on the top. So in addition to being a bit of a historical oddity, I do remember that the Barge Canal makes a real visual impact. It's a significant piece of infrastructure there.

I have a few questions. I have reviewed a lot of the record, of course, in preparation for today and I just want to be clear that it may be that some of the questions that I'm highlighting today are actually somewhere in that very voluminous record. I'm not in any way trying to indicate through these questions that there was anything deficient in the record, that the Applicant and the Staff review that's built, again, a tremendous volume of material.

Some of this is just to perfect and clarify my understanding leading up to the findings

that the Commission will need to make if it indeed authorizes the issuance of the license. You mentioned the Integrated Resource Plan that's filed with the Florida PSC, what is the planning horizon for that? Is it ten years or 20 years or does it have a range of outlooks?

MR. KITCHEN: In Florida, the Integrated Resource Plan is a ten year plan.

COMMISSIONER SVINICKI: Okay. And you mentioned that growth rates are anticipated or perhaps projected of 1.5 percent per year for the next ten years, did I have that correct?

MR. KITCHEN: Yes.

COMMISSIONER SVINICKI: And that there is an identified need, therefore, for new base load power over that range. Is it possible given uncertainties to answer the following question, is there a time period or a range of years within which the initiation of construction of Levy becomes a competitive option when looking at adding that base load generation? Are there too many variables in terms of the retirement of other assets or other requirements that might exist? Or is there kind of some range over the planning horizon or beyond the ten year IRP that the construction of Levy would become kind of in the mix

in terms of probability of initiating construction?

MR. KITCHEN: We started, and Chris may add, currently the -- we look at several factors in terms -- as any Integrated Resource Plan and all utilities have, we look at energy cost, of course the generation of need, anticipated decommissionings. And carbon is a big uncertainty for us, we don't know the impact there. I think the big driver in Florida for us is demand, which is there, but also the fuel mix. As Chris mentioned, we have no nuclear in Florida now. And so, the additions that we have made, and as I mentioned, there's a combined cycle plant being built, have been gas. And we're approaching almost 80 percent gas. So I think fuel mix is a big driver.

To answer your specific question, is there a time frame certain? I would have to say, no, at this point. It depends on so many factors and there's a lot of uncertainty with where the clean power, what requirements are going to be on emissions, how do we meet that with or without nuclear, that I don't think I could answer a specific date.

COMMISSIONER SVINICKI: Okay, yes. And I wasn't looking for that, just again, if issued the licenses have an initial period, if I have this right, of 40 years. So I'm trying to get a sense of when

would the probability of the Levy Units being a competitive choice begin to emerge in that 40 year period. And it sounds like -- again, I've acknowledged up front what a difficult question, there's so many parameters in that decision making matrix that I understand the difficult.

So, what I'll take from the answer is that, at the time, there is not an identified period of time within which you could project that it would become competitive or that this would become a preferred option. So, that's the conclusion that I'll draw from the difficulty of the uncertainty. Having visited the site eight years ago and then studying the record that's been built, there certainly has been a lot of field work and subsequent analysis by the Staff in support of looking at the alternative locations that were at least considered by Progress Energy back in the day prior to submitting Levy as the proposal.

Is there -- how would you characterize at a very high level the things that resulted in Levy being the preferred of the candidate sites that were looked at? Was there some -- is it things like being able to have the barge access or something? What are the factors that tipped that equation most significantly in terms of Levy and against the other

sites?

MR. SNEAD: Well, Commissioner, I would say that some of the factors that made both the Crystal River site and the Levy site more preferable to the other sites, the other sites were more riverine --

COMMISSIONER SVINICKI: Okay.

MR. SNEAD: -- based and with the need for reservoir support in having the demands on fresh water supplies in the state of Florida, the use of salt water for condensate cooling was certainly a lot more advantageous from an environmental impact standpoint. So I think that drove primarily those two sites to being preferable to the other sites that we looked at. Then, between those two sites, they were, from an environmental impact standpoint, they were essentially equivalent to one another.

COMMISSIONER SVINICKI: But there was consideration, was there not, and again, back in this time period, Crystal River Nuclear Unit was an operating unit --

MR. SNEAD: Correct.

COMMISSIONER SVINICKI: -- there was, my understanding is there was consideration of the concentration of generating assets --

MR. SNEAD: Right.

COMMISSIONER SVINICKI: -- then that would be at Crystal River and that might have edged Levy over Crystal River between those two. Is that correct?

MR. SNEAD: Correct. It was more of a practicality, a practicable solution if you would, to separate those resources, not concentrate so much generation at one site. And as Bob mentioned, with the combined cycle plant being built to replace the power generation of Units 1, 2, and 3, that situation still exists at the Crystal River Energy Complex. So the decision to choose the Levy site in preference over the Crystal River site is still a valid one.

COMMISSIONER SVINICKI: Okay. Thank you. And the Staff has provided and it is in the record a very substantive analysis of new and significant information over the intervening years. So I'm aware of the fact that the Staff did look at any changed circumstances and has provided that analysis. With that, I'll close. Thank you, Mr. Chairman.

CHAIRMAN BURNS: Thank you, Commissioner. Commissioner Baran?

COMMISSIONER BARAN: Thanks. Thank you again for being here and for your presentations. Under NRC's regulations, when NRC issues a combined

license, the licensee also automatically receives a general license to construct and operate an independent spent fuel storage installation. If Duke receives a combined license and if you ultimately opt to construct the Levy Units, do you expect to construct an ISFSI at the Levy site?

MR. KITCHEN: Let me address that. I don't know that we can answer that.

COMMISSIONER BARAN: Okay.

MR. KITCHEN: And the reason I say that is our need for an additional storage to the AP1000 spent fuel pool would be years out. And so, the question you're really asking is, what options would we have for dry storage? Well, what options would we have for spent fuel storage. So, the factors there would be, when do we actually construct, what options are there for fuel long-term storage at that time, is there a government repository, or would we need dry storage? If we were to make that decision, then we, as you mentioned, would have the ability to move forward. We don't have a plan currently for that.

COMMISSIONER BARAN: Okay. Just uncertain at this point. Okay. Thanks. That's all I have for this panel.

CHAIRMAN BURNS: Okay. Again, thank you,

gentlemen, for your testimony. We'll take just a moment here to call the Staff witnesses for the overview panel forward. And as with our previous panel, this is an opportunity for the NRC Staff to provide an overview of their review of the Levy Application. Again, I remind the witnesses on this panel that they are under oath and that they should assume that the Commission is familiar with the prehearing filings. And with that, I'll ask the panelists to introduce themselves, starting with Mr. Akstulewicz.

MR. AKSTULEWICZ: Frank Akstulewicz, Director of New Reactor Licensing, Office of New Reactors.

MS. UHLE: Jennifer Uhle, Director of the Office of New Reactors.

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

CHAIRMAN BURNS: Okay. And I'll let you proceed. Is it -- oh, we'll take a brief moment.

MS. UHLE: Good morning, Chairman Burns and Commissioners. On behalf of the Levy Review Team, we are certainly pleased to address the Commission at this mandatory hearing today. So, with me on this

panel, as you know, Frank Akstulewicz to my right and Sam Lee to my left. You've seen other members of the Review Team as they have taken the oath this morning. So, we will present on this panel the results of -- or, excuse me, today, in the other panels subsequent to this panel as well, we will present the results of the Staff's review of the Application for the Combined Licenses or COLs for the Levy Nuclear Plant Units 1 and 2 proposed to be located in Levy County, Florida.

So, the Staff's Final Environmental Impact Statement was completed in 2012 and the Staff's Final Safety Evaluation Report was completed in late May of this year. These documents are the culmination of an eight year review by the Staff and this review effort was done by several groups of people that were composed of scientists, engineers, attorneys, and administrative professionals from across the Agency, as well as other agencies and our consultants. So, next slide, please.

So, during this panel, Mr. Akstulewicz and Mr. Lee will briefly describe the Staff's evaluation of the Levy Nuclear Plant COL Application. They will present an overview of both the safety review as well as the environmental review. And we will also talk in our discussion of the safety review a bit on the

departures of the Certified Design. The Staff docketed the Application in July 2008 and since then, the Staff has expended approximately 83,000 hours on the safety and environmental reviews. The effort has involved well over 100 engineers, scientists, and technical specialists.

During this time, the Staff conducted approximately 100 public meetings and conference calls in support of the review. The Applicant responded to approximately 690 Staff Requests for Additional Information, of which 580 were associated with the safety review and, therefore, over 110 with the environmental review. In addition, the Staff considered over 2,800 comments on the Draft Environmental Impact Statement. Contractors working with the Staff devoted approximately 39,000 hours to support both the environmental and the safety review. So, as you can tell, the review of the Application was a very thorough and complete effort.

Within the NRC, the offices that contributed to the review include the Office of Nuclear Security and Incident Response, which looked at emergency preparedness and security areas, the Office of Nuclear Reactor Regulation evaluated financial qualification aspects of the Application,

and the Office of Nuclear Materials, Safety, and Safeguards, which supported the reviews for licenses necessary under Part 70 for special nuclear material, Part 30 for by-product material, and Part 40 for source material, were also part of the team.

The Office of the General Counsel reviewed the SER and Environmental Impact Statement. And finally, the Advisory Committee on Reactor Safeguards reviewed and reported on the safety aspects of the Levy Application in accordance with the regulatory requirements of 10 CFR 52.87. In addition, the Region II Office supported environmental meetings in the community near the Levy site. The U.S. Army Corps of Engineers also contributed and that part of the activities was done by the Jackson Field District. And then also, the Department of Homeland Security contributed to the NRC review.

The SER, the Safety Evaluation Report, and the Environmental Impact Statement, or EIS, and our statement in support of the hearing provide what the Staff considers to be an adequate basis for making the necessary regulatory findings. Next slide, please. So, to introduce some detail, on July 30, 2008, representatives of Progress Energy Florida delivered an Application dated July 28, 2008 for a COL to

construct and operate two AP1000 units at a greenfield site in Levy County, Florida.

Following a corporate merger, reorganization, and a name change, Duke Energy Florida, LLC became the Applicant in April 2013. So, Duke Energy Florida, LLC would be licensed to construct and operate the units if approved. Next slide. The Levy Nuclear Plant Units 1 and 2 COL Application incorporates by reference the AP1000 Design Certification Document Revision 19 and Appendix D to 10 CFR 52, the AP1000 Design Certification Rule. The AP1000 design was certified by rule in 2011. Next slide, please.

The Levy Units 1 and 2 COL Application contains material incorporated by reference from the AP1000 Certified Design. 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 program, site specific design, combined license information items, and departures from the Certified Design.

As of now, the Levy Combined License Application is one of three applications referencing the AP1000 Certified Design currently under Staff review. In addition, the Commission has previously issued licenses for two AP1000 Combined License Applications covering four units currently under construction. So I'd now like to turn the presentation over to Mr. Frank Akstulewicz.

MR. AKSTULEWICZ: Thank you, Jennifer. Good morning, Chairman; good morning, Commissioners. As you heard, I'm the Director in the Division of New Reactor Licensing and the Office of New Reactors. Next slide, please.

In accordance with 10 CFR 52.87, the Advisory Committee on Reactor Safeguards examined the Staff's safety review of the Levy Nuclear Plant Units 1 and 2 COL application. The Applicant and the Staff supported five AP1000 subcommittee meetings specifically related to the application and its safety evaluation. The Staff presented the results of its review of the application to the full ACRS initially in December 2011, and more recently, April of 2016. Next slide, please.

As a result of the December 2011 Full Committee meeting the ACRS issued a report on December

7, 2011 concluding that there is reasonable assurance that the Levy Nuclear Plant Units 1 and 2 can be built and operated without undue risk to public health and safety. This ACRS report recommended approval of the COL application following implementation of two recommendations regarding tsunami hazards.

The first ACRS recommendation was to establish a license condition to require inclusion of a probabilistic evaluation of the tsunami hazard in the Site-Specific Full Scope Probabilistic Risk Assessment that is required prior to fuel load.

The second ACRS recommendation was that the Staff should verify that the inclusion of the nearby shipping canal and watercourse would not significantly affect the conclusions of its Deterministic Tsunami Hazard Evaluation.

In its response dated January 24th, 2012, the Staff explained that the license condition is not appropriate because the Staff's independent analysis confirmed the Applicant's results that the risk from flooding by conservatively calculated maximum tsunami is not significant for this site. In addition, the Staff screened out flooding events from further analysis because the risk of external flooding was negligible in accordance with Regulatory Guide 1.200

which is titled "An Approach For Determining the Technical Accuracy of Probabilistic Risk Assessments for Risk-Informed Activities." The Staff response also described the basis for its conclusion that the shipping canal in question had been adequately considered.

In April of 2016, the ACRS Full Committee reviewed the five design changes associated with the Applicant's request for exemptions for the AP1000 certified design. The design change associated with condensate return will be discussed later today during the Safety Panel. The other changes were related to the main control room dose, main control room heat-up, combustible gas control and containment, and the plant monitoring system compliance with IEEE Standard 603-1991 titled "IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations."

On April 18th, 2016, the ACRS issued a report concluding that these exemptions are needed to enable the certified design to perform intended functions and should be approved. The ACRS also recommended that the Staff evaluate on a generic basis whether there are any Lessons Learned regarding the oversight of the Quality Assurance Program during development of designs seeking certification under 10

CFR Part 52.

The Staff responded on May 22nd, 2016 committing to schedule a future briefing of the ACRS to discuss the recommendation of the generic concern. After completing its response to the ACRS, the Staff issued the Levy Nuclear Plant Units 1 and 2 Final Safety Evaluation in May of 2016.

The five aforementioned design changes were not included in the currently licensed Vogtle and Summer COL applications that also incorporate the AP1000 reference design. These design changes include changes to Tier 1 and Tier 2 information, as well as technical specifications in the AP1000 design control document. Because they involve changes to Tier 1 information and technical specifications, the Applicant included exemptions for the changes in this COL application.

The two other COL applicants incorporating the AP1000 certified design currently under review by the Staff, which are the William States Lee Units 1 and 2, and the Turkey Point Units 6 and 7 have requested the same exemptions and departures associated with these changes that are submitted by the Levy Applicant.

Licensees for the fuller licensed AP1000

plants under construction, the Vogtle and Summer units, have committed to implement these design changes using the LAR process in the future. Incorporating the same design changes into all 10 of the AP1000 COLs allows for a more efficient Staff review as envisioned under the design-centered review approach and maintains design consistency across the AP1000 design center. Next slide, please.

The Staff prepared SECY-16-0076 dated June 10th, 2016 to support this mandatory hearing. In its paper, the Staff summarized the basis that would support the Commission's determination that the Staff's review is adequate to support the findings set forth in both 10 CFR 52.97 and 10 CFR 51.107. The Staff SECY paper provided an overview of the findings that support the issuance of the COLs for the Levy Nuclear Units 1 and 2.

In order to issue a COL, the Commission must find that each of the findings in 10 CFR 52.97 are met, and I will summarize generally the Staff's basis supporting each finding.

First, the applicable standards and requirements of the Atomic Energy Act and the Commission regulations have been met. The Staff review and evaluation of the application against the

applicable criteria in 10 CFR -- I'm sorry, the Staff reviewed and evaluated the application against the applicable criteria in 10 CFR. Based on its review as documented in the Final Safety Evaluation and its Final Impact Statement, the Staff concludes that the applicable standards and requirements of the Atomic Energy Act, 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 Florida, as well as the required Federal Register notifications have been made. Next slide, please.

Third, there is reasonable assurance that the facility will be constructed and operated in conformity with the license and 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 its Final SER and EIS, and the Inspections, Tests, Analysis, and Acceptance Criteria, or ITAAC, and the license conditions as part of the license provide the necessary assurance that the unit will be constructed and operated as required.

Fourth, the Applicant is technically

qualified and financially qualified to engage in the activities authorized. The technical and financial qualifications of the Applicants are summarized in the SECY paper and documented in detail in Chapters 1, 13, and 17 of the Final Safety Evaluation Report. Next slide, please.

Fifth, the issuance of the COL will not be inimical to the common defense and security, or the public health and safety. The specific basis for an inimicality finding have been provided in the Staff's SECY paper.

And sixth, the findings required by Subpart A of 10 CFR have been made. The Staff's conclusions regarding the findings required by Subpart A will be presented by Sam Lee, who will now provide an overview of the Staff's Environmental Review. Next slide, please.

MR. LEE: Thank you, and good morning, Mr. Chairman and Commissioners.

As Jennifer indicated earlier, I am the Acting Deputy Director of 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.

The Staff prepared an Environmental Impact Statement, EIS, for the Levy Nuclear Plant Units 1 and 2 Combined License application in accordance with National Environmental Policy Act of 1969, and the requirements of 10 CFR Part 51. The Staff prepared the EIS based on its independent assessment of the information provided by the Applicant, and the information developed independently by the Staff, including information gathered through consultations with other agencies.

The U.S. Army Corps of Engineers fully participated with the Staff as a cooperating agency in preparing the Levy 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 the development of the draft EIS and final EIS. Next slide, please.

The NRC began the Environmental Review process for the Levy COL application by publishing a Notice of Intent to Prepare an EIS and conduct scoping

in the Federal Register on October 24, 2008. Two scoping meetings were held to obtain public input on the scope of the Environmental Review in Crystal River, Florida on December 4th, 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 E of the Final EIS. The Staff contacted federal, state, regional, and local agencies 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 Fishery Service, federally recognized Indian tribes, the Florida State Historic Preservation Office, and other agencies, as required by the Endangered Species Act, National Historic Preservation Act, and other statutes. Next slide, please.

The draft EIS was issued in August 2010. A 75-day comment period for the draft EIS began on August 13, 2010, the date of the publication of the U.S. Environmental Protection Agency Notice of Availability. The Staff held two public meetings on

September 23rd, 2010 in Crystal River, Florida 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. Next slide, please.

On April 27, 2012, the Staff published the Final EIS as NUREG-1941. 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 Levy 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 consideration of comments on the draft EIS, and (6) assessments summarized in the EIS, including the potential mitigation measures identified in the Environmental Report and in the EIS. Next slide, please.

The Staff included a draft Summary Record of Decision as a reference in the SECY. This document

states the decision being made and identifies all alternatives considered in reaching the decision. Next slide, please.

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 alternative selected. Next slide, please.

This slide lists the environmental findings pursuant to 10 CFR 51.107(a) that the Commission must make to support the issuance of the Levy Nuclear Plant 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(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 requirements in Subpart A of 10

CFR Part 51. The Staff concludes that the environmental findings in the EIS constitute 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 Levy COLs addresses (1) the environmental impact of the proposed action, (2) any unavoidable adverse environmental impacts, (3) alternatives to the proposed action, (4) the relationship between local short-term users of the environmental and the maintenance and enhancement of long-term productivity, and (5) any irreversible and 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 of 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 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. Next slide, 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. Next slide, please.

Based on that analysis, the Staff concluded that the building and operation of the proposed Levy Nuclear Plant 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. Next slide, 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 not turn over the presentation back to Jennifer Uhle.

MS. UHLE: Thanks, Sam.

So in our Overview Panel we provided just that, a brief overview of the Staff's review. In subsequent panels, 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 Staff's review process. Specifically, the Safety Panel will cover three topics; the first is Geologic and Geotechnical Site Characteristics, the second is the Roller Compacted Concrete Foundation Design, and lastly, the Condensate Return Design Change discussed earlier. The Environmental Panel will discuss the U.S. Fish and Wildlife Service biological opinion and the evaluation of alternative sites.

So this concludes the Staff's opening remarks and we are prepared to respond to any questions you may have. Thank you.

CHAIRMAN BURNS: We'll begin this round of questions from Commissioner Svinicki.

COMMISSIONER SVINICKI: Thank you, Jennifer, Frank, and Sam, and all of the NRC Staff whose work supported the overview that you just gave. I want to thank you for your input and for the presentation.

Jennifer, you covered the number of hours of review, and I appreciate your doing that. I would have asked you to do it if you hadn't because of a concern I sometimes express at these hearings, that given the visibility of today's mandatory hearing, some members of the public may tune in and go is that all there is? And there is so much more. There have, again, been tens of thousands of hours of review and analysis that have gone into today's hearing and will ultimately support the findings that the Commission needs to make in order to approve issuance of the licenses.

I have a couple of other topics, one of which Frank touched on. I do always for these mandatory hearings look closely at the back and forth with the Advisory Committee on Reactor Safeguards who, of course, participates in monitoring and looking at the sufficiency of the review as a matter of law given their role under the Atomic Energy Act.

Frank, you talked about the issues that

they raised, the Staff response. I looked carefully at that record in preparation for today's hearing and I might just ask a point of clarification, on the issue of the tsunami hazard, I looked at the identification of that in the initial letter, the Staff's response, and even some further follow-up that the Commission asked in pre-hearing questions on this matter.

I confess to being a little bit puzzled. I, based on the Staff's response that the ACRS return to the issue again in their letter responding to the Staff's response, I interpreted it a bit as the ACRS' tendency to desire risk assessments, specifically PRA in some cases, that they find desirable to augment the record but which in some cases is simply in excess of that needed by the Staff in order to support the adequate protection conclusions that Jennifer outlined when she began the Overview Panel.

There is, of course, a difference between just a desire to augment the record and that which is required. Does the Staff consider this issue -- again, I found the Staff's response -- I'm not as expert as the Staff in these matters, but just as a technical person without specific expertise in this hazard, the Staff's response to the ACRS struck me, and then other materials in the record struck me as beyond sufficient

to address this matter. Does the Staff consider this matter sufficiently addressed?

MR. AKSTULEWICZ: I'm no tsunami expert either. I think the record would indicate that the Staff believes this issue to be retired, and has addressed the concerns by the Committee both in its conversations with the Committee and in the written documentation provided. If there's additional questions here, I'd have to defer to the Staff expertise in this area, and we could call them up, if necessary.

COMMISSIONER SVINICKI: And that answer is sufficient for the question. I was just trying to understand whether there were any kind of remaining issues.

The other issue that was in the ACRS letter that you mentioned, Frank, was a kind of generally articulated concern about Lessons Learned and QA, which again I interpreted as venturing maybe more into a kind of a management realm. But in any event, I didn't interpret that as having specific nexus to the Levy review or the Staff's conclusions. Do you agree with my assessment?

MR. AKSTULEWICZ: That's correct. The Committee was raising a general concern about how

design changes are handled as part of the post-certification process, and what is the oversight of those activities both by the vendor itself, and by the utilities, the licensees, applicants, whatever form they take. So it was more that construct that they were concerned about rather than a unique issue associated with Levy.

COMMISSIONER SVINICKI: And that was migrated over to some other engagement between the Staff and the ACRS. Is that correct?

MR. AKSTULEWICZ: Yes, that's correct.

COMMISSIONER SVINICKI: Okay, thank you for that.

The other topic is more general. This is not my first AP1000, and neither is it the Staff's. Does the -- the certification and the issue finality afforded to the AP1000 under its design certification, as you have moved through now a number of COL applications referencing the -- even subsequent applications referencing the AP1000, we have units of the AP1000 under construction in the U.S., and more advanced construction levels in China, and we have a lot of technical engagement with the Chinese regulator. Do those activities have a kind of a feedback loop into the Staff's review of something

like the Levy COL or other COLs referencing AP1000 that you have ongoing? And if so, in what way?

MS. UHLE: Yes, there is a feedback loop. Well, first of all, if there were to be an error identified, although the design certification provides, you know, an appropriate issue finality, if an error is identified that is necessary for compliance then it must be addressed, and that overrides the finality. Certainly, the AP1000 design center has benefitted by the construction in Sanmen, as well as the construction in the United States. The design when it's approved at the certification stage is only partially completed. It's necessarily complete for the safety finding, but then there's a great deal of design work that goes from taking a certification design level to the constructability design; in other words, blueprints, if you will. So as issues are identified overseas, say in China, as well as the construction sites then, of course, we are aware of those. They are shared with the AP1000 Owners Group, and they are addressed appropriately.

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

CHAIRMAN BURNS: Thank you. Commissioner Baran.

COMMISSIONER BARAN: Thanks. I just keep going right from that point.

As Duke explained on the first panel, and Frank also talked about, five of the departures in the Levy application are pretty significant modifications that essentially represent generic changes to the AP1000 design.

Frank, you talked a little bit about this, but if the Commission approves these departures and the related exemptions for Levy, how would that affect other AP1000 applicants or applications, lee Turkey Point or any future AP1000 application?

MS. UHLE: Well, for one thing, the -- all of the subsequent COLs will be following through with appropriate design changes. In addition, the Vogtle and Summer licensees are also committed to address the issues, as well.

Frank, if you want to add anything?

MR. AKSTULEWICZ: Yes, Commissioner. I think -- you heard Mr. Kitchen mention that all of the design modifications are reviewed as part of their ongoing interactions with the utilities, so before a design change actually arrives at the NRC for its evaluation there is alignment within the AP1000 community that these are the changes that will be

implemented across the board at all of the licensees referencing the AP1000, so there is that alignment going in.

But more importantly, I think Jennifer got it right, that Vogtle -- I'm sorry, the Lee Station and the Turkey Point applications will have these in them already. The applications are already submitted that reference these particular changes and are requesting these same exemptions.

The Vogtle and Summer licensees are staging their submittals a little bit based on their construction need dates, so while we don't have all of the amendments in house for these five actions at the moment, there is the commitment that these licensees will follow through with the same modifications that we're discussing here.

COMMISSIONER BARAN: So it's effectively a standardized response to these issues for all applications.

MR. AKSTULEWICZ: That's correct. That's the design-centered review approach, as Mr. Kitchen said. One issue, one solution, one fix.

COMMISSIONER BARAN: Thank you.

CHAIRMAN BURNS: Thanks. One of the things that the Staff and Applicant have followed is Staff

Guidance in ISG-11 called "Finalizing Design Basis, or Licensing Basis Information," to determine which changes in AP1000 have to be factored into the Levy design before issuance of license. As a result of this review or other work the Staff has done, has the Staff identified any Lessons Learned or potential changes to that guidance document, ISG-11?

MS. UHLE: I would say certainly the Lesson Learned is to insure that when there are small changes that are made that we do appropriate communication across the Staff to insure that no other technical area is affected, so that's certainly a Lesson Learned. At this point, we don't see that ISG, or Interim Staff Guidance 11, requires any changes. Frank?

MR. AKSTULEWICZ: I agree with Jennifer. The ISG itself doesn't suggest the need for change. What I would offer is that what we've -- what I recall from the first opportunity here when we were licensing Vogtle, that the conversation went well, when we do our finalized design we're going to find areas where we're going to change because construction is going to identify those. All I would offer is this is the proof positive that that actually is the case, that when we certify a design we don't have the complete set of

details, we don't have the complete set of procurement specs, we don't have everything that you would need to actually construct a design. And when you start looking at that, then you identify areas potentially where some modification occurs.

CHAIRMAN BURNS: If issued, the Levy COLs, we have the fifth and sixth COLs in the AP1000 Design Center, eighth and ninth overall when you factor in Fermi and South Texas. Is it -- could you discuss how the format and content of the licenses evolved since the last time an AP1000 license was issued, which was Summer? Because based on a very cursory look at sort of format, layout of some of the license seems reordered and reorganized and trying to understand the rationale, or what's changed?

MR. AKSTULEWICZ: Well, personally I'm not that tied into how much changes in format there are. I didn't expect any to be significant, but I think you've seen changes as we've evolved with respect to the Fukushima license conditions, orders translating to license conditions. You've seen the evolution of other requirements that we've learned from the licensing activities that are ongoing at Vogtle and Summer, and I know there's another license condition associated with the potential limits on radioactivity

in the Rad Waste Building. That's a unique license condition, that is a difference. But those are kind of Lessons Learned. The overall structure I still think is pretty much the same, though, with the structure for the ITAAC and the structure outlining the conditions and stuff like that.

CHAIRMAN BURNS: One last question I have in this area. We noted during the Staff's overview that the Environmental Impact Statement was issued in 2012, four years ago. My question relates to while obviously we developed such a -- you know, the product just like a Staff's SER and the EIS after the appropriate consultations, comment period, you've got it coming out in a fixed period. You come out -- and when I say fixed period, you fix an issue with the document. My question would be just as a general matter, since the issuance of the EIS, has there been any particular engagements, formal or informal, with other agencies that might have been consulted, or how does the Staff maintain awareness of potential developments that might affect the EIS, recognizing that not every small change means something, or is meaningful with respect to the conclusions of the EIS, but that there -- whether you need to maintain awareness of that?

MR. LEE: So after the issuance of the Final EIS, the Staff is engaged in monitoring any new information that may come forward as new and potentially significant information, and so since the issuance of the FEIS, we have received a number of new information that the Staff analyzed to see if they were of significance. And as part of the end game or the completion of the preparation for the SECY paper, as well as other supporting documents, one of the deliverables is a memorandum that concludes the Staff's analysis of new and potentially significant information, and we have not identified any significant information to date on that.

MR. AKSTULEWICZ: Yes, just to supplement Sam's -- I believe the record would show that there were 20 issues that were evaluated by the Staff as being new for the potential significance that could lead to supplementation of the EIS.

CHAIRMAN BURNS: Okay, thank you. I have no other questions at this time.

With that, we'll conclude the Overview Panel. We're going to take a brief break. Let's re-gather at 10 to 11:00, and we'll proceed with the Safety Panel, and we'll go from there. Thanks. We're adjourned for 10 minutes.

(Whereupon, the above-entitled matter went off the record at 10:42 a.m. and resumed at 10:53 a.m.)

CHAIRMAN BURNS: I'm going to ask everyone to take their seats again so we can proceed with our second panel, or our second portion I should say. We have two panels in the second portion of the hearing to cover safety matters. The parties will address relevant sections of the application and three chapters in particular from the final safety evaluation report, chapter 2 on site characteristics, chapter 3 on design of structures, components, equipment and systems, and chapter 21, design changes.

I'll remind everyone that the witnesses are under oath and that again they should presume that the Commission is familiar with their prehearing filings.

For this portion, again to explain how we'll proceed, we'll have the Applicant provide its testimony and then the staff. We'll ask the staff to come up to provide its testimony. And then we'll have a question and answer session for the Commissioners based on the testimony or other matters they may wish to raise regarding the safety aspects of the application.

So again, I'll ask the Applicant's witnesses to introduce themselves and then you may proceed.

MR. SINGH: My name is A.K. --

CHAIRMAN BURNS: Pull the microphone toward you. Thank you.

MR. SINGH: A.K. Singh. I work for Sargent & Lundy.

MR. THRASHER: John Thrasher, Director of Engineering, Nuclear Development, Duke Energy.

MR. KITCHEN: Bob Kitchen, Director of Licensing, Duke.

MR. TAYLOR: Lawrence Taylor, Lead of Procedure and Program Development within Nuclear Development.

CHAIRMAN BURNS: Okay. You may proceed.

MR. KITCHEN: Thank you, Commissioner. John Thrasher and I are going to present. First John's going to talk about the foundation design at Levy and some of the unique features there and then I'll talk about the condensate return design change.

John?

MR. THRASHER: Good morning, Mr. Chairman and Commissioners.

Next slide, please. A large number of

borings were performed to fully characterize and understand the Levy site and address potential karst. Karst is defined as sinkholes or depressions formed due to solution activity in limestone. Limestone formation at the Levy site, the Avon Park Formation, has a low potential for karst.

Initial site investigations postulated karst features the majority of which were less than one foot in width while the largest was conservatively postulated to be approximately five feet in width. Additional detailed investigations determined that these potential karst features were not voids, but actually small pockets of weathered rock in the limestone, however the roller-compacted concrete RCC bridging mat is conservatively designed for a 10-foot wide karst feature.

Next slide, please. The Levy Nuclear Island foundation design is very robust as shown in this slide. First ptolemaic groundwater intrusion into the excavation diaphragm walls and grouting will be installed to form somewhat a bathtub as a construction aid. Diaphragm walls will be installed from the surface around the perimeter of the nuclear island to form the sides of the bathtub and a 75-foot-thick grouted zone will form the bottom of the bathtub

at the bottom of the excavation. After placement of the diaphragm walls and grouted zone the interior of the bathtub will be excavated and the excavation will be mapped.

The 35-foot-thick RCC bridging mat will then be placed in one-foot-thick compacted lifts. Roller- compacted concrete has been used in construction in many dams as an acceptable method of placing large amounts of concrete to form a robust structure. A waterproof membrane will then be installed prior to pouring the six-foot-thick reinforced concrete base mat of the AP1000 standard plant nuclear island.

Next slide, please. Two ITAAC ensure that the RCC bridging mat and the waterproof membrane conform to design parameters as described in the Final Safety Analysis Report. Two license conditions requires Duke Energy to perform geologic mapping of excavations for safety-related structures and to also submit a test report verifying RCC strength and constructability prior to placing the roller-compacted bridging mat.

Bob Kitchen will now present information on condensate return.

MR. KITCHEN: Next slide, please. This

slide shows a cross-section of the AP1000 containment design on the right. The concern with condensate return arose related to the closed-loop operation of passive residual heat removal operation. That heat exchanger uses the in-containment refueling water storage tank as the heat sink. That's shown on the drawing on the lower left and is labeled IRWST.

Basically the heat sink being the IRWST eventually boils and steam is released to the containment environment. That steam condenses on the containment walls and runs back down. You can see the larger red arrows that illustrate that. So that condensate is then returned to the IRWST, or in-containment refueling water storage tank, to maintain the heat removal capability of that heat exchanger.

The condensate return that was assumed was about 90 percent for the design certification of AP1000. Subsequent testing done by Westinghouse involving full-scale mockups, etcetera, indicated that return rate was much lower in fact to the point that the performance was affected for closed-loop operation. So that's what drove the design.

The design change really involved essentially a catchment system, gutters and piping downspouts to return more condensate particularly from

around the polar crane grid and the internal stiffener of the containment liner back to the IRWST. That was the change in substance that was made.

Next slide. The passive RHR, passive residual heat removal performance was demonstrated using a safety design-basis accident analysis to meet 72 hours performance requirements to satisfy GDC 34 for safe protection of the fuel in a reactor coolant system.

In addition, we did a long-term analysis using more realistic conditions; we refer to it as conservative non-bounding, to demonstrate that we could achieve a specific temperate of 420 degrees in 36 hours and maintain that for at least 14 days. Previously had indicated that that would be an indefinite operation. So that is a change. The 420 in 36 is not a change.

Basically the other thing to mention is that from a safety function standpoint the system has the capability to shift to open-loop where you depressurize and then you're on recirculation through containment.

So those are the criteria that we demonstrated following the design change. That concludes your presentation on these two issues.

CHAIRMAN BURNS: Okay. Thank you, Mr. Kitchen and Mr. Thrasher.

I'll ask the staff then to come up. Okay. And again, I'll ask you to identify yourselves for the record and I remind everyone you're still under oath and can assume that the Commission is familiar with your prehearing filings.

I'll start with you, Mr. Travis.

MR. TRAVIS: Boyce Travis, a member of the Containment Ventilation Branch in NRO.

MR. THOMAS: Vaughn Thomas, structural engineer in the Office of New Reactors.

DR. STIREWALT: I'm Gerry Stirewalt, Senior Geologist, NRO.

MR. HABIB: Don Habib, Project Manager, Division of New Reactor Licensing.

CHAIRMAN BURNS: Okay. Thank you and I'll let you proceed.

MR. HABIB: Good morning, Chairman Burns and Commissioners. Again my name is Don Habib. I'm lead project manager for the staff review of the Levy Nuclear Plant, Units 1 and 2 combined license application.

Next slide, please. And joining me on the panel are Dr. Gerry Stirewalt, Mr. Vaughn Thomas, Mr.

Boyce Travis.

Next slide. The staff presentation for this panel will discuss three novel site-specific issues from the safety review, and the three topics in order are first the geologic and geotechnical characteristics of the Levy site; second, the use of roller-compacted concrete below the foundation; and third, departures from the AP1000 certified design relating to the design change to the condensate return portion of the passive heat removal system.

And I'll now turn it over the presentation to Gerry Stirewalt who will address the topic of the geologic and geotechnical characteristics.

DR. STIREWALT: Thank you, Don. I'm still Gerry Stirewalt. I'd like to roll -- take the next slide and quickly roll directly into the issue that relates to site characteristics.

The Applicant identified the potential for subsurface voids created by dissolution of the limestone in the Avon Park Formation, which is the foundation unit, as the primary geologic hazard at the site.

In the next slide you'll note that the Applicant determined that these dissolution voids were less than five feet in vertical dimension, and that

number is actually based on measured lengths of rod drops in bore holes.

Let me quickly explain that. Just the weight of the drill stem itself passing through hard rock, if you hit a cavity, it drops until it hits the bottom. So it's a standard method and that's exactly how it's done.

And the maximum horizontal dimension of 5.3 feet was actually based on measured grout uptakes, again measured during the grout testing.

In the next slide you'll note that the staff confirmed the Applicant's characterization of the voids by a number of methods, certainly by examination of rather sparse outcrops; it's Florida, after all, bore hole lithologic and geophysical log, drop core and grout uptake testing. And all of those things were done during site audits. So those are field observations. And also review of select publications you sited in the FSAR.

Well, I am a geologist, so I have to take you into the field. So into the next slide I'd like you walk you to an outcrop of the Avon Park and I want to point out a couple of features in this slide.

You'll note one feature that's labeled as a horizontal bedding plane. That's just a function of

the deep positional history of the unit. You'll also see vertical fractures that cross-cut that. And if you look at that in three dimensions, you think about the horizontal plane and the vertical plane. That in fact forms the plus sign geometry that the Applicant described as most likely being a rather good control on subsurface dissolution and void development.

In the next slide let me walk you quickly and show you some core. The upper right image shows a small disconnected dissolution void. Now what does that mean? Well, in the first place they're small, certainly less than foot in diameter in this sample of core. And the fact that they are disconnected is important because that indicates that it's not going to pass fluid, groundwater readily through this unit. And the lower slide shows what used to be a vertical fracture. It in fact was sealed by grouting during the grout testing.

So let me talk in the next slide then sort of about our overall conclusions. Certainly based on the sorts of things you just saw in that field visit field data do support the maximum dimensions of the dissolution voids in the foundation unit and the interpretation that those voids are not more than one foot in diameter. And also subsurface voids will not

detrimentally affect the stability or the suitability of the Avon Park.

And in the final slide I want to just touch on the idea for grouting. The grouting is done strictly for groundwater control just during construction. And let me reiterate it's not safety-related, it's not credited in the evaluation of safety for the life of the plant. So this is strictly for groundwater control during construction and fortuitously perhaps it will likely seal or at least reduce the size of dissolution voids within the safety-related structures and restrict the flow of groundwater into the foundation excavations. And you saw an illustration of that in a previous slide.

That concludes my discussion of the site characteristics. I'll be pleased to pass the talking baton to Mr. Vaughn Thomas.

MR. THOMAS: Okay. Thanks. Next slide, please.

Good morning. And once again my name is Vaughn Thomas and I'm a structural engineer in the Office of New Reactors. I'm here to present to you the staff's review of the design and construction of the roller-compacted concrete bridging mat for the Levy application.

It was a novel issue in the staff review because neither the AP1000 DCD nor the American Concrete Institute ACI 349 addresses the requirements for un-reinforced concrete. Moreover, this foundation design concept was not utilized for the combined license applications.

This figures shows a cross-section of the nuclear island foundation which includes the RCC bridging mat that will be used to transmit the nuclear island design loads. The RCC bridging mat would be designed as a structure that is capable of supporting the nuclear island loads.

The purpose of the RCC bridging mat is to replace the weakly submitted soil and to bridge conservatively postulated voids between the nuclear island, base mat and the grouted portion of the Avon Park Formation. The RCC bridging mat will be constructed of un-reinforced concrete. It will be approximately 35 feet thick and will be built on top of a 75-feet-deep grouted Avon Park Formation. A waterproofing membrane will be placed between the RCC bridging mat and a six-inch-thick concrete mud mat which is consistent with the commitments in the AP1000 DCD.

Next slide, please. The RCC bridging mat

will be designed using industry codes and standard methods that have been successfully implemented on large commercial RCC projects such as the Saluda Dam in South Carolina.

The Applicant committed in the FSAR to using RCC construction standard guidance in the "United States Army Corps of Engineers Engineering Manual." For the conceptual design phase of the RCC the Applicant committed to using ACI 349, Load and Strength Reduction Factors, ACI 318, Equations for Computing Tensile Strength and Modulus of Elasticity of Structural Un-reinforced Concrete, and the Army Corps of Engineers Engineering Guidance.

Next slide, please. Additionally, the Applicant performed analysis of the bridging mat to confirm that the capacity versus loading demands are adequate. The Applicant also demonstrated that the stresses in the RCC bridging mat will remain within code allowable limits and that is therefore assured of performing its intended function.

Next slide, please. For the construction of the RCC bridging mat the Applicant committed to using mixing, placement and compaction equipment consistent the "Army Corps of Engineers Engineering Manual" and equipment comparable to that used in large

successful commercial projects. The Applicant also committed to following the codes and the industry standards such as ACI 318 and ACI 349. This provides assurance that the RCC bridging mat will be successfully constructed and would have the desired strength. The Applicant included a detailed test plan that describes the quality control and inspection that is expected to occur during construction of the RCC bridging mat.

Implementation of the test plan will ensure that the mixing, placement and compaction of the concrete comply with construction specification. At the site the pre and post-RCC testing will verify that the specified compressive strength, tensile strength and sheer strength across the lift joints are achievable. Furthermore, the Applicant's RCC test result from the commercial RCC projects confirm that the use of the design values from ACI 318 and the Army Corps of Engineers Engineering Manual are appropriate.

Next slide, please. The post-COL RCC imbedding mixed testing will be performed in a large test bed at the site prior to production of the RCC bridging mat. The Applicant proposed a license condition for post-CUL testing which states that the licensee will complete 180 days prior to construction,

then a 90-day test report for the strength verification and constructability testing in accordance with the criteria outlined in the FSAR. The Applicant also proposed an ITAAC to ensure that the production RCC bridging mat placement and constituents are consistent with the design requirements resulting from the testing program.

Staff concludes that the information provided by the Applicant including the proposed license condition and ITAAC demonstrate that RCC bridge mat is capable of transferring NI loads while providing the desired level of performance.

And this concludes my presentation. Thank you. And the next presenter is Mr. Travis.

MR. TRAVIS: Thank you, Vaughn. I'm Boyce Travis and I'll be addressing the condensate return design change.

Next slide, please. The condensate return departure is one departure for the Levy design. It's described in further detail here as an example the departures and exemptions evaluated by the staff for the Levy Nuclear Plant.

For the AP1000 the safety-related system designed to remove decay heat following a non-loss of coolant accident such as a loss of AC power is the

passive residual heat removal heat exchanger, or PRHR. The heat exchanger is submerged in the in-containment refueling water storage tank, or IRWST. Upon receipt of a signal valves open and natural circulation drives coolant from the reactor coolant system hotleg through the heat exchanger where it cools down and then returns to the steam generator exit plenum back to the cold leg.

Eventually the water in the IRWST boils and steams to containment. Some of the steam is held up in containment. Most of the remaining steam reaches the containment shell where it condenses and returns to the IRWST through a gutter system. In order to continue operating in this mode the passive core cooling system must achieve a sufficient condensate return rate such that the water level in the IRWST is maintained so that the PRHR heat exchanger can continue to remove decay heat.

Next slide, please. The Applicant discovered that the existing design was incapable of meeting the previously assumed condensate return rate. As such, design changes were necessary. Because of the uniqueness of the system and its importance in the passive design of the AP1000, significant testing and analysis was required to determine the efficacy of the

condensate return rate on the performance of the PRHR heat exchanger.

The design changes involve adding additional guttering for routing and collection as well as improvements to the existing gutter design so that less condensate is lost. The change also includes a departure from the AP1000 certified design for the operational duration of the passive core cooling system from indefinite to greater than 14 days.

Next slide, please. The staff's review focused on the capability of the design to meet the requirements associated with GDC 34, Residual Heat Removal. Staff reviewed the analytical models used to produce the reactor coolant system and containment response, the testing that determined the calculated loss rates along the containment shell and the associated design data.

The Applicant performed testing for losses over attachments to the containment shell. The loss values obtained informed the containment calculation for condensate return. This calculation interfaces with the reactor coolant system model to determine coolant behavior and the PRHR heat exchanger system performance. The staff performed independent

confirmatory analyses and arrived at values similar to those determined in the Applicant's analysis supporting the staff's finding.

In the certified AP1000 design the PRHR is specified to sustain indefinite operation for a non-LOCA event. In looking at the detailed analysis for this design change the Applicant determined this was not the case, and so the revised Levy FSAR replaced indefinite with a 72-hour safety-related period of operation and a 14-day design requirement. The 72-hour operational period is consistent with the NRC's position for compliance with GDCs 34 and 44. Ultimately, the plant retains the ability to transition to open-loop cooling by using the automatic depressurization system at any time.

Next slide, please. As a result of the review the staff found the modified design meets the decay heat removal requirements associated with GDC 34. Staff ensured that the existing containment and transient safety analyses were not impacted by the design changes.

For the design-basis accident analyses specifically staff requested that the Applicant perform additional calculations demonstrating the system performance for greater than 72 hours as

compared to the shorter durations demonstrated in the certified design. These calculations showed system performance is not challenged using design-basis assumptions. Staff performed confirmatory analysis to verify this determination.

Consistent with the certified AP1000 design and the NRC's position as expressed in SECY 494-084, titled, "Policy and Technical Issues Associated with the Regulatory Treatment of Non-Safety Systems in Passive Plant Designs," the plant is capable of achieving a safe shutdown condition of 420 degrees Fahrenheit in 36 hours following a non-LOCA event using on the PRHR heat exchanger. Analysis supporting this design condition is laid out in the shutdown temperature evaluation in chapter 19(e) of the FSAR. Staff performed confirmatory analyses that supported these analysis conclusions.

This review involved numerous public meetings, ACRS briefings and requests for additional information. The Applicant addressed all the staff's safety questions and adequately captured the necessary changes in the FSAR. The staff determined the departures associated with the condensate return system met the applicable regulations and were acceptable.

This concludes the staff's presentations to the Safety Panel and we'd be happy to address any questions at this time.

CHAIRMAN BURNS: All right. Thank you very much. What I might ask the staff witness to do is maybe move a little aside so we have a clear view or, or as clear a view as we can of the Applicant witnesses. That's great. You're doing a great job there.

And we'll start off this round of questions with Commissioner Baran.

MEMBER BARAN: Thanks. Boyce, can I follow up on the condensate return departures? As you discussed and Mr. Kitchen discussed, the departures changed the length of time during which the reactor could passively remove decay heat from an indefinite period of time to a finite period. Does the staff believe there is still additional margin with respect to the rate of condensate return and overall decay heat removal capability?

MR. TRAVIS: So, I think I'll answer that question in two parts. There is additional margin purely with respect to the condensate return capability. The staff performed confirmatory analyses at lower condensate return rates that indicates the

system was capable of performing at a return rate of less than -- so I think the numbers may be proprietary in terms of the return rate itself, but the system is capable of performing at a return rate somewhat lower than what is assumed in the analyses. The analyses itself includes either a 0.7 or 0.9 percent margin of losses that are just captured purely as margin, not as a physical loss rate.

And in addition, the system as a whole is still capable of indefinite performance if you go to open-loop cooling. By utilizing the automatic depressurization system you can -- the AP1000 is capable of containment recirculation cooling, and that is still indefinite, only limited by the -- nominally by containment leakage.

MEMBER BARAN: And, Duke, do you have anything you wanted to add to that, or you can leave it there if you want to.

DR. STIREWALT: No, I think Boyce covered the margin question very well.

MEMBER BARAN: Okay. So you're confident there's still margin?

MR. TRAVIS: Yes, that's correct.

MEMBER BARAN: Okay. Let me ask, I want to follow up on prehearing questions 30 and 31,

departure from main control heat load.

Both the Applicant and the staff responses state that the main control room area radiation monitor used to declare emergency action level AA3 in this case would be de-energized on either a high radiation signal for the control room air supply or a loss of all AC power for greater than 10 minutes.

So let me ask the staff with this design change will control room operators be required to use field instruments to monitor control room radiation levels following a loss of off-site power for greater than 10 minutes?

MR. TRAVIS: I'm going to have to defer that to a staff expert.

CHAIRMAN BURNS: Again, state your name and your position and please confirm whether you've been sworn in.

MR. LaVERA: My name is Ron LaVera. I'm a health physicist in the Office of New Reactors and I have been sworn in.

CHAIRMAN BURNS: Okay. Please proceed.

MR. LaVERA: Yes, the question was asked in the context of 10 CFR 20.1501 for monitoring workers. And, yes, those rad monitors do de-energize during the course of the event for a loss of power

greater than 10 minutes. The Applicants stated that they would be using battery-powered instruments to monitor the conditions in the control room. Because that meets the requirements of 10 CFR 20.1501, that's an acceptable response and the provisions of those monitoring instruments will be made in accordance with the emergency plan requirements.

MEMBER BARAN: In terms of the operation of those devices does this create any concerns about operator burden during an emergency?

MR. LaVERA: There was no statement as to whether the operators would have to do that themselves, whether the instruments would be staged in the control room or site health physicist personnel would be called to the control room to do that. We did ask about the power availability if they needed to do an instrument plug-in into the control room. They did say that there would be there and that they would cover that in the emergency plan.

MEMBER BARAN: And is this something that -- is this unusual, this approach? Has this been used in other emergency plans?

MR. LaVERA: I don't have the expertise to answer that question.

CHAIRMAN BURNS: State your name and

position and confirm that you've been sworn in.

MR. BARSS: Dan Barss, team leader in the Office of Nuclear Security and Incident Response, and I have been sworn in.

To your question about will this create additional burden first, one of the things which we now require, and it's I believe a license condition to this Applicant, is that they need to do an analysis of the on-shift staff that they do have and what potentially could happen and do they have enough staff to fill all those positions to perform all those functions? They use an NEI guidance, NEI-1005 I believe is the number of that guidance document. And that's an analysis that they actually do later. And it's not down now because you need the thing built, you need the staff trained to kind of do the walk-throughs to see if you can prove that.

But to the question of the additional burden, that's part of the reason of doing that analysis is to look to see can they do all the things that they're expecting their staff to do in an emergency. And they would be able to identify then if there is a problem or if there is not a problem and then appropriately adjust their staffing. At this point in time I don't believe that will cause a

significant issue for them.

As to whether or not others use portable instruments, it's not common to rely on them in a control room, but certainly if you have a loss of power, it's expected that you would have and that you'd do that, that you would come in and do that. So knowing that in this case that they would have that condition develop, we expect that they have the instruments available, have the people trained and able to operate them and do that monitoring.

MEMBER BARAN: Okay. Thank you.

Thank you.

CHAIRMAN BURNS: Thank you. I want to turn to the site geology for a couple minutes and draw on your experience, Dr. Stirewalt.

I understand that I think as excavation might proceed there is going to be some monitoring of the excavation probably to assure that there's -- our expectations about potentially detrimental geologic features are confirmed. In other words, that we would essentially have our assessment of the site -- it doesn't -- the karst formation don't pose a challenge in terms of the siting itself.

Perhaps you can describe for me as one excavates what would be looking for, what would -- how

that would proceed. And I'll let you answer and then maybe the Applicant as well.

DR. STIREWALT: Yes, thank you for that question. I get to talk about geology a little more.

(Laughter.)

DR. STIREWALT: The point that you bring up is what do you look for to make the determination that the site is still okay relative to properties of the rock that the plant's going to sit on? Well, the geologic mapping condition in fact is what we use to ensure that the staff can go into the excavation, look at the materials, look at the maps, do a direct comparison.

And, for example, if we see areas that are grouted extensively, then we realize, well, maybe there was a few more fractures than we thought. These have been filled. So that's the kind of observation that you'd be -- things you'd be looking for in that excavation and again comparing directly what we see in the field, standing on the exposure with the map that the Applicant provides.

CHAIRMAN BURNS: Okay. Are there scenarios -- I realize this may be given the evaluations that have done -- I -- actually before I say that, is there anything you wanted to add on that?

DR. STIREWALT: No, nothing else to add.

CHAIRMAN BURNS: Okay. Let me go to -- the second part is while -- I think we've done an evaluation, made best judgments about the -- what we would expect. Are there -- do you see scenarios that might identify a hazard that might need to be addressed as we come out? What would it be, I guess, and -- or even the likelihood?

DR. STIREWALT: Well, again in the case of the Florida location it probably isn't young faulting just because those kinds of features don't permeate Florida at all.

CHAIRMAN BURNS: Yes.

DR. STIREWALT: So it would likely be related to the karst formation. And again, we've a good handle on the maximum size of the voids. They will do the proper grouting with the proper mix to make certain those things are then filled.

And I don't know, Vaughn, do you want to add any point on that at all?

MR. THOMAS: I think you've addressed it correctly. I don't think I have anything to add to that.

CHAIRMAN BURNS: Okay. Vaughn, let me ask you, so you mentioned that this technique, a roller-

compacted concrete foundation design, has been used in some other application. Could you describe for me a little bit more what types of facilities or circumstances in which -- you mentioned I think a dam maybe in South Carolina, or somewhere in the Southeast.

MR. THOMAS: That's correct. It's true that this is something that's never been addressed in the nuclear industry, but they have been used in -- for dams, and many for dams and also pavements.

So the Applicant -- what the data is. They compare some of the results from using some of those applications and compare some of the results. When we say "results," we're talking about aggregates and fly ash and cement ratios and stuff like that and compare that to what they will probably use for the Levy application and show that the results are really comparable and that they should be, that they would be able to build the RCC at that particular site.

CHAIRMAN BURNS: Okay. Does the Applicant want to add anything to --

MR. KITCHEN: No, that's -- we agree with the response.

CHAIRMAN BURNS: Okay. Thank you. One question. Prehearing question 15 relates to the size

and shape of the proposed plume exposure and emergency planning zone. And the response that the staff discusses -- section the 10-mile radius around the site; we use generally as you know a 10-mile radius, that is included with the EPZ due to the location of roadways and other identifiable features.

Could you maybe, Mr. -- I'm not sure -- ah, good. Dan's back.

(Laughter.)

CHAIRMAN BURNS: Ah, anticipated the question. Well, help me out if you would. Can you explain why that section is carved out and why the staff is satisfied it meets the requirements with respect to emergency planning zone, the plume exposure part of the emergency planning zone?

MR. BARSS: Yes, Dan Barss again, team leader in the Office of Nuclear Security and Incident Response and I have been sworn in.

The regulatory requirement is or states that an area of about 10 miles, so it's not specific that it has to be exact 10 miles. If you further look at the guidance it basically says use what are reasonable boundaries that are recognizable, identifiable and suitable for planning around.

And in fact in the process of developing

this, I believe in the 2007 time frame, the Applicant met with the state and local government authorities who would be responsible for implementing the emergency planning if it should ever need to be implemented, and they identified to their satisfaction what were reasonable boundaries to use to establish those emergency planning zones. And they identified specific roads or rivers or railroads, whatever. I'm not sure exactly what they used. I don't remember the specifics for this one. But they identified those and then came to the conclusion that was acceptable.

In the case you're mentioning I don't know the exact distance. I looked at a large-scale map and you can see I think someone estimated it may have been a mile or more in that area. But to the staff's review and consideration, that is acceptable because it's about 10 miles. There's no magic to that 10-mile number. It's more a planning basis.

It's more important that you have something that's a recognizable boundary that's easily communicated. And in fact, it's the people on the ground, the emergency management people that are going to have to use this information in the future. We're the ones that establish the boundaries. I have great confidence that that is probably the best place to

establish the boundaries for this plan.

CHAIRMAN BURNS: Okay. Thank you.

Commissioner Svinicki?

MEMBER SVINICKI: Thank you all for the presentations. I have one question for the staff and one for the Applicant, and I'll begin with the staff.

Gerry, I'm going to build a little bit off of the Chairman's question on the geologic mapping and you'll get a chance to talk about geology again.

Following up prehearing question 2 though, you covered some of this ground with Chairman Burns, but to have a proposed license condition on the geologic mapping the staff responded that the Applicant has provided sufficient data to support the staff's safety findings, which is kind of the procedural point I'm getting to. But the staff goes on to state that the additional site-specific information which would be generated by the fulfillment of the license condition would provide more information on geologic features and the excavations.

And so what I'd like you to respond to is again to clarify that the staff stands by its safety conclusion based on the information that's in the record now. But could you talk more about why the

license condition will provide something essential? Again Dr. Uhle testified to the fact that in any changed condition that you found, if the staff learned something was in error as these units were under construction, the NRC always has the authority to say this is not as it was indicated to be.

I'm trying to get to kind of what tipped you towards the necessity of a license condition as opposed to just saying we'll go in there once they've excavated and look for any differing site conditions or fundamental changes in understanding?

DR. STIREWALT: I'm glad to address that. The reason is the information that we have right now is based on surface observations and bore hole data. And since it's not Swiss cheese, bore holes have some reasoned spacing and literally you don't know everything that's down there. So when you expose the actual foundation bedrock where you can walk on that, map it and look at it, it gives you a better feel for that third dimension that literally you couldn't get 100 percent of your hands around with even good subsurface data and certainly with the surficial mapping. So that's the reason. It gives us a chance and the Applicant to look, map that in detail and carefully consider what's there again to see if it

matches what was proposed from the other data set.

MEMBER SVINICKI: But with that response does the staff still support its conclusion in the Safety Evaluation Report Section 2.5.3.4.8 where you state that you find that the Applicant provided a thorough and accurate description of the potential for tectonic and non-tectonic surface deformation at the site?

DR. STIREWALT: Yes. Based on the information they had at that time, yes.

MEMBER SVINICKI: Okay. Thank you.

And my second question is for the Applicant. Regarding any draft or proposed license conditions having to do with SAMGs and the broader issue of mitigation strategies, as a current operator of a fleet of nuclear plants right now, as the implementation of flex strategies has occurred across both Duke units and across the United States, have there been opportunities that have presented any lessons learned regarding mitigation strategies, approaches for the potential Levy units or are they fundamentally so different in terms of their passive safety characteristics that there aren't any applicable feedback from the ongoing operating reactor experience?

MR. TAYLOR: I can answer that. I think you characterized it very well. The AP1000 is significantly different for its flex strategies, so we have stayed engaged, plugged in with the other AP1000s and will learn more from them as they move forward with implementing their strategies. But we are very different from other sites. We do stay engaged with our fleet, but AP1000 information would be more applicable.

MEMBER SVINICKI: Okay. Thank you.

Thank you, Mr. Chairman.

CHAIRMAN BURNS: Well, thank you all for the presentations. I would just add I enjoyed talking about karst because I think it's a based on a Slovenian word for a geologic formation in Slovenia. I remember going to the caves about 10 years ago there. I got that more or less right? I think so.

MEMBER SVINICKI: That reminds of the movie My Big Fat Greek Wedding where everything -- he said you know that's Greek?

CHAIRMAN BURNS: Oh, yes, yes.

(Laughter.)

CHAIRMAN BURNS: Well, everything else today will be Slovenian.

In any event I do appreciate the

appearances by the witnesses on these two panels, the safety issues. We will adjourn now. I think we're scheduled to come back at 1:15. Have I got that right? Yes, 1:15. And at that point we'll have the Environmental Panel as well as any other matters we have.

So again, thank you for the presentations this morning. We are adjourned until 1:15.

(Whereupon, the above-entitled matter went off the record at 12:56 p.m. and resumed at 1:18 p.m.)

CHAIRMAN BURNS: This afternoon we have our environmental panel and then an opportunity for the Applicant and the staff to make closing presentations. We'll begin of course with the environmental panel and as with the safety panel, we'll have a presentation from the applicant, then the staff and then open the floor to questions from the Commission.

During this panel, the parties will address the final Environmental Impact Statement, and particularly two novels that the staff has identified first, a biological opinion issued by the U.S. Fish and Wildlife Service and second, alternative sites. I remind the witnesses they are under oath, and again they should assume we are familiar with their

prehearing filings.

I'll ask the panelists to introduce themselves as we go for each panel, and we'll start again with the Applicant, and so Mr. Kitchen, maybe you start and then your other colleagues, or Mr. Fallon, either way.

MR. KITCHEN: Bob Kitchen, Director of Licensing, Duke.

MR. FALLON: Chris Fallon, Vice President, Nuclear Development.

MR. SNEAD: And Paul Snead, Manager of Siting and Licensing Support, Duke Energy.

MR. YOUNG: Lorin Young with CH2M Hill.

CHAIRMAN BURNS: Okay, and you may proceed.

MR. SNEAD: Thank you, Chairman. The first slide, please. Next slide. In summary with the environmental review, the environmental report was completed in 2009, and it underwent thorough NRC staff audits and also thorough analysis of the alternative sites that were looked at.

There was extensive public outreach during the environmental review process and consultations with federal, tribal, state and local government agencies. The final Environmental Impact Statement,

of course, was published in April of 2012, and since that time Duke Energy undertook a new and significant information review process and we performed that recently at least semi-annually, and the process and the specifics of that process were audited by the NRC staff in February and March of this year.

Next slide, please. With regard to alternative sites, again this graphic shows the state of Florida in the blue-shaded area is the service territory. As the region of interest for our site selection process, we selected the service territory plus one county beyond it within the state of Florida, to make sure we didn't overlook any obvious site that was close to our service territory that may be useful to us.

So with this region of interest, we evaluated candidate areas and the graphic at the bottom is showing a screening process where we screened the candidate areas and have selected 20 potential sites, and those sites were selected based on issues like proximity to major water sources, proximity to transmission lines, low population areas, ecological sensitivities and so forth.

We further screened those 20 potential sites down to eight candidate sites which underwent

additional screening, and ultimately came up with five alternative sites. The alternative sites included the Levy site, a site we called the Crystal River site, which would be adjacent to the Crystal River energy complex, and then Dixie, Putnam and Highlands, which were named for the counties that they were predominantly in.

These sites were further evaluated with some specific geotechnical evaluations and further surveys, and of course Levy was identified as a the proposed site. The final Environmental Impact Statement concluded that there was no environmentally preferable alternative site, and that there was no obviously superior site.

Furthermore, the Army Corps of Engineers, in their record of decision for the 404 permit, concluded that Levy was the least environmentally damaging practicable alternative site.

Next slide, please. The U.S. Army Corps of Engineers permitting process, as has been mentioned before, they were cooperating agency with the NRC in the preparation of the EIS, and a major component of the Corps permitting process is the development of a wetland mitigation plan that was developed to support that process.

The 404 permit was issued by the Corps in December of 2015, and that memorializes the mitigation plan within that permit.

Next slide, please. With regard to the U.S. Fish and Wildlife Service's biological opinion, no federally threatened or endangered species were identified on site or that were likely to be adversely affected. The only species that was subject to potential adverse effect is the Florida scrub jay, which was identified along some of the transmission line corridors.

The U.S. Fish and Wildlife Service issued a biological opinion in December of 2011. That opinion included an incidental take statement for the Florida scrub jay, and that incidental take statement requires surveys to be for certain sensitive species to be reconducted within two years of construction or land clearing operations.

Next slide. That concludes the Duke Energy presentation.

CHAIRMAN BURNS: Okay. We'll move then to the NRC staff's presentation, and actually identify yourselves.

MS. SUTTON: Mallecia Sutton.

MR. KUGLER: Andy Kugler, Senior Project

Manager, Environmental and Technical Support Branch.

CHAIRMAN BURNS: Please proceed.

MS. SUTTON: Good afternoon. As I stated, my name is Mallecia Sutton, and I am the Environmental Project Manager for the Levy Units I and II environmental review. With me today is Andy Kugler, Senior Project Manager in the Division of Safety and Environmental Analysis in the Office of New Reactors.

This presentation will discuss two novel environmental issues. I will first discuss the biological opinion and incidental take statement by U.S. Fish and Wildlife Service, and Andy Kugler will discuss the site selection process for alternative sites for the Levy project.

Next slide, please. NRC initiated consultation on the Section 7 of the Endangered Species Act for the proposed Levy nuclear plant, Units I and II, which included communication with the U.S. Fish and Wildlife Service and National Marine Fisheries Service in November of 2008.

NRC must consult with these agencies to ensure its actions, such as issuance of the combined license, will not jeopardize the continuing existence of any threatened or endangered species, or critical habitat within their jurisdiction. The U.S. Army

Corps of Engineers is a cooperating agency on the Levy nuclear plant Environmental Impact Statement and performed its Section 7 consultation jointly with the NRC.

Next slide, please. The NRC staff coordinated its Section 7 consultation with the National Environmental Policy Act, also known as NEPA. NRC published a draft Environmental Impact Statement on August 13, 2010 and made it available for public comment for a period of 75 days.

NRC concurrently submitted a biological assessment to Fish and Wildlife Service and National Marine Fisheries for comments. Comments on the draft EIS and biological assessment were received by the NRC from both agencies. National Marine Fisheries responded that no further action was required, concluding its consultation with the NRC.

Fish and Wildlife Service concluded, however, that the project would have adverse effects on the Florida scrub jay. Fish and Wildlife comments indicated that additional surveys for threatened and endangered species may need to be completed before Fish and Wildlife could consider consultation complete.

Next slide, please. After several

meetings between NRC staff and Fish and Wildlife to discuss potential terms and conditions to protect the Florida scrub jay, the Fish and Wildlife issued a biological opinion and incidental take statement for the project.

This was the first biological opinion received in relation to a new reactor license application under review by the NRC's New Reactor Office. The biological opinion and incidental take statement include terms and conditions addressing protection of the Florida scrub jay.

Fish and Wildlife Service also indicated in the biological opinion that updated licensing surveys and protective measures for several additional plant and animal species would be needed in order to support a Fish and Wildlife conclusion that building and operating the Levy nuclear facility would not adversely affect those species.

Next slide, please. The NRC staff contacted the Fish and Wildlife Jacksonville Field Office to clarify the scope of the conditions necessary to close Section 7 consultation, following the coordination process to develop conditions that would meet the needs of both agencies.

Next slide, please. The NRC and Fish and

Wildlife agreed upon conditions to include an environmental protection plan that met the intention of the biological opinion and incidental take statement. Those conditions cover a total of three animal species and two plant species.

These subsequent interactions helped formulated the NRC staff's conclusion in the final EIS. Both NRC and Fish and Wildlife worked efficiently and effectively together to meet both agencies' regulatory obligations. That concludes my presentation, and I'll turn it over to Andy Kugler.

MR. KUGLER: Thank you, Mallecia. Next slide, please. Again, my name is Andy Kugler. I'm a senior project manager. As directed by the Environmental Standard Review Plan, the staff evaluated the process that was used by the Applicant to identify and compare sites. We concluded that the process was reasonable, that it was consistent with NRC guidance, and that it identified sites that were among the best in the region of interest.

The staff also independently compared the alternative sites to the proposed site and concluded that none of the alternative sites was environmentally preferable to the proposed site. After the draft Environmental Impact Statement was issued, two issues

were identified in which the staff believed the Commission might have an interest.

One issue was related to the availability of water at the Highland site, and the other issue was related to the practicability of the Crystal River site. I will discuss each of these issues in turn.

Next slide, please. Regarding the Highland site, the South Florida Water Management District submitted comments on the draft Environmental Impact Statement regarding the water that would be needed at the Highlands alternative site. The comments indicated that the availability of water in that area was very limited, and they listed a number of challenges that would be faced if that site was selected.

But while the Water Management District indicated that obtaining the water would be difficult, it did not say that it could not be accomplished. The staff reviewed the comments from the Water Management District and concluded that they were consistent with the staff's determination that the impacts of water use at the Highland site would be moderate.

Next slide, please. The staff considered whether based on the comments from the Water Management District, the Highland site should be

removed from consideration in the Environmental Impact Statement.

But the staff decided to retain the Highland site because removing it from the Environmental Impact Statement would serve no purpose, and because of concerns raised by the Water Management District confirmed the staff's determination that the Highland site was not environmentally preferable.

More recently, during a review of an alternative site for another application near the location where Highlands is, the Water Management District indicated to the staff that it believed that the plant could obtain the water it would need through a combination of approaches. This information supports the decision to retain the Highlands site in the Environmental Impact Statement.

Next slide. At the time the staff prepared the Environmental Impact Statement, the Crystal River energy complex adjacent to the Crystal River alternative site had five operating units, one nuclear and four fossil. As part of its application for a permit to the U.S. Army Corps of Engineers, the Applicant stated that it did not consider the Crystal River site to be a practicable alternative.

As defined for the purposes of the Clean

Water Act review for the least environmentally damaging practicable alternative. The Applicant indicated that its view was based on the concern about having too much generation concentrated at one site, increasing the potential for a major grid disruption.

The Corps of Engineers found the basis for excluding the site from its evaluation to be acceptable.

Next slide. The staff considered whether under these circumstances the Crystal River site should be retained as an alternative site for the Environmental Impact Statement. The staff decided to retain the site because it rated well from an environmental perspective, and the site remained viable for building new nuclear units.

The staff also recognized that the standards for alternatives under the National Environmental Policy Act, which calls for reasonable alternatives, are somewhat different from the standards under the Clean Water Act. The term "practicable" can encompass issues such as cost and logistics in light of the overall project purpose.

Thus, the Corps' Clean Water Act analysis for the Levy permit application included consideration of non-environmental factors to determine if an

alternative was practicable. I'll note that the Corps concluded that retaining the Crystal River site in the Environmental Impact Statement was acceptable, as this was a joint Environmental Impact Statement between the NRC and the Corps. That concludes my remarks.

CHAIRMAN BURNS: Thank you again for both panels for their presentations. I'll begin the questioning on this panel. One of the things I'd like to get some clarification on for the record, and with respect to the staff's answer to prehearing question 55 regarding the EPA's comments on the draft Environmental Impact Statement.

In its response, the staff noted that impacts to wetlands was EPA's primary concern, that EPA noted that there may be a need for "changes to the current site layout or application of mitigation measures that would reduce the environmental impacts." Staff further noted, and you've touched on, that the NRC and Army Corps of Engineers worked with EPA to identify further reductions of wetlands impacts, and these have been incorporated into the FEIS.

But the staff noted the FEIS actually reports somewhat greater wetland impacts on the Levy site, approximately 450 acres versus 403 acres I think that are reported in the DEIS. But this is reflected

by the fact that the final environmental statement used more accurate wetland delineation data than the draft impact statement.

Can you confirm there is indeed a reduction in impact to wetlands realized from the work done between the draft and the final impact statement?

MS. SUTTON: Hi, this is Mallecia Sutton. Actually, the total wetland impacts from the draft to the final environment impact statement is actually 690 acres for that impact, and what the applicant did was to offset the impacts of wetlands was to purchase mitigation banks, as well as they came in with a supplemental mitigation plan, where they created 91 acres on the Levy site to offset those impacts.

So there is a -- between the DEIS and FEIS, the number did change.

CHAIRMAN BURNS: Okay. Again, it's -- the number changed.

MS. SUTTON: But working with the Corps and working with the NRC, the Applicant did create wetland banks, as well as brought in wetland banks create wetlands, as well as mitigate the wetlands on the Levy site. So that they created about 91 acres of wetland on the Levy site.

CHAIRMAN BURNS: Okay. So the -- to

review again, the staff's evaluation in sum then that the impact is acceptable or not acceptable?

MS. SUTTON: It's moderate. Yeah, it's a moderate impact.

CHAIRMAN BURNS: Moderate impact.

MS. SUTTON: Yes sir.

CHAIRMAN BURNS: Okay, all right. That's all the questions I have. Commissioner Svinicki.

COMMISSIONER SVINICKI: Thank you very one for your presentations. I have two questions and they are for NRC witnesses, either if they're not -- if they can't be addressed by the witnesses at the table, perhaps someone else can come to the microphone.

The first has to do with the fact that although not undisturbed, the Levy site is considered a greenfield site, and that is a certain uniqueness in comparison to other COL applications that NRO has reviewed.

When you are reviewing a site that has a currently operating reactor, by virtue of previous licensing reviews and also just NRC's oversight of the operations there, you have access to certain data and baseline information.

Could someone discuss at a very high level what challenges it might have posed to have the

greenfield site? Did you have to do more extensive fieldwork yourself? Is there anyone who could just speak at a broad level about that?

MR. KUGLER: This is Andy Kugler. Well, I guess I'll start off. As we indicated in response to one of the prehearing questions, the guidance that we follow for our reviews doesn't really consider specifically a brownfield or a greenfield site. It's written to cover whatever situation we're dealing with.

Even in a lot of the places where we're dealing with a reactor that would be built adjacent to existing units, it would be built on ground that had trees or fields. I mean, you know, it was not true brownfield where they were going to build. So the approach that we took to our evaluation is really not any different for a site like this.

COMMISSIONER SVINICKI: Okay, thank you. The second topic has to do with the Environmental Justice analysis. The final Environmental Impact Statement states that the review team conducted active public outreach and onsite investigation in the region of interest.

Could you just discuss at a high level how you approach that in the Environmental Justice

analysis and for Levy?

MS. SUTTON: I'd like to call Dan Mussatti to the stand to give a general overview of the process. Thank you.

CHAIRMAN BURNS: Again, please identify yourself, your position and confirm that you've been sworn in.

MR. MUSSATTI: My name is Daniel Mussatti. I'm the socioeconomist for NRO and I have been sworn in.

CHAIRMAN BURNS: Okay. Please proceed.

MR. MUSSATTI: The process that we go through for Environmental Justice is a several step process, to make sure that we don't overlook anybody. The first step involves taking the information that comes from the Applicant, which is based on census data and other demographic information, confirming that independently and identifying places where we think that there might be populations of interest.

They're not really populations that would have an impact, an EJ impact, but they are a population with a dense enough population of minorities or low income people, that we really want to take a closer look at them.

The next step in that process is to go to

the area, typically during the scoping meeting, and we do a windshield analysis is what we call it. We drive around, we look at the area to see where low income housing might be, to see the quality of the housing that's available, these sorts of things for the socioeconomic and for the Environmental Justice impact.

Then we start talking with community leaders. We'll bring our maps in and we'll show the mayor this is what we found. Is this right, or have we overlooked something? Occasionally, they'll come and point out and they'll say there's a minority community that lives over here, and it's not showing up on your map. So we go there to find out what's going on.

Once we gather all that information, we come back and we combine all of that together and start looking then for the pathways by which an impact could reach those communities, to be able to determine an EJ impact.

COMMISSIONER SVINICKI: Okay, thank you. That's very informative. Thank you, Mr. Chairman. I'll end there.

CHAIRMAN BURNS: Thank you. Commissioner Baran.

COMMISSIONER BARAN: For the purpose of organizing ourselves, I just have a couple of questions for the Applicant, and then I think the rest of my questions are for the staff. As I mentioned earlier, with a COL comes a general license to construct an onsite ISFSI, which is essentially a dry cask pad. ISFSIs typically require disturbance of several acres of land.

Understanding that there's uncertainty about whether and when an ISFSI might be constructed if you have the COL and you constructed the units, can you talk a little bit about whether you would factor in the level of disturbance, previous disturbance of the land in selecting an ISFSI site?

Is that question -- you know, so if you get to the point where you're going to build an ISFSI, are you going to look, are you going to consider whether it's previously undisturbed or not and to what extent?

MR. SNEAD: Oh absolutely. Of course, we haven't made a decision that we would need a dry storage facility as of yet. But if we did, we would look and we could put it on previously disturbed land or land that had previously been certified as part of our project.

If we ever identified land outside of that certification if you will with the state, where it's -- we're going to have to disturb additional wetlands or, you know, something that was not in our previous certification, we would have to do the appropriate surveys to make sure that we're not affecting any TAV or that we have cultural resource surveys for the area that we're going to be disturbing and those type of activities would have to take place.

The likelihood of that, if it's an area that's not previously certified for disturbance, we would have to get a modification to our certification with the state.

COMMISSIONER BARAN: Okay, and so just so I understand, as this is more of a background question I guess, are you certified for disturbance on the entire site plot right now?

MR. SNEAD: Basically, we've identified the areas that will be disturbed by the construction and the operation of the plant, and those have been surveyed from a cultural resource standpoint, from a threatened and endangered species standpoint. They've been identified in terms of their impacts they may have on wetlands or even secondary impacts to wetlands.

So all of that is part of the process that's previously been done. So what I'm saying is if it was anything that would go beyond that to a new location that hadn't been thought of previously on this property, we would have to go through those same steps again.

COMMISSIONER BARAN: Okay, thanks. All right. You can slide back over. You're very practiced at that. Well, let me ask a few questions to the staff about the ISFSI general license that accompanies a combined license, if it were to be issued.

Section 106 of the National Historic Preservation Act requires federal agencies to consult with the appropriate State Historic Preservation Officer or SHPO, and try, if an activity might impact properties that are historic or have a cultural or religious significant to tribes.

So that consultation is part of NRC's licensing process. In the staff's NHPA, consultation with Florida's State Historic Preservation Officer and the appropriate tribes, did the staff explain that a general license for an ISFSI would automatically accompany a combined license?

MS. SUTTON: When the staff consulted with

the SHPO, the staff with the Corps of Engineers looked at the entire 31-acre site, and in the certification for the state, as well as the Corps permit, it talks about any future disturbance. So no construction activity, as stated in Corps Permit No. 9, of any type related to the Levy project, no construction activities can take place until surveys are completed.

Then when you look at the state conditions, it says if any future -- during any construction activities, if anything is found they need to stop and consult with SHPO as well, and notify the appropriate agencies. So as part of NRC's consultation, it also -- and part of the Historic Preservation Act, it talks about future disturbance.

So that's covered under both the state's certification as well as the permit for the Corps.

COMMISSIONER BARAN: Okay. So that's -- so there was a discussion at a general level about future disturbance, activities that could cause future disturbance. In the description of what this project would be in the consultations under NHPA with the SHPO, did the staff ever say part of this project could include an ISFSI, that that license accompanies the combined license specifically?

MS. SUTTON: I would like to take that

response back.

COMMISSIONER BARAN: I'd like an answer to that now, if we can get it.

MS. HERRITY: Hello. My name's Jennifer Dixon Herrity. I am currently acting as Licensing Branch Force Chief. Normally, I'm the Environmental Projects Branch Chief and I was sworn in.

CHAIRMAN BURNS: Okay. You can proceed.

MS. HERRITY: The question was whether or not we consulted on it? We did not.

COMMISSIONER BARAN: Okay.

MS. HERRITY: When we initially did the consultation that was done back in the 2011 time frame, 2012, we did not.

COMMISSIONER BARAN: Okay, and so is -- was that unusual? Is it unusual for the staff to omit discussion of this aspect of a new reactor project during consultation, or has that been the typical practice for COLs?

MS. HERRITY: I think that this has been the typical practice. We talk about the project in general. We do not go into details about what could happen.

COMMISSIONER BARAN: Okay, and so let me just ask the basic question here, which is why didn't

the staff explain to the Florida SHPO that a combined license includes an ISFSI general license? Why is that not something that was discussed during consultation?

MS. HERRITY: It wasn't something that was specifically covered at the time, because it was an option of something that could happen. Now going forward, we do note that we should discuss that in the future. It's a lesson that we've learned, and we are in the process of modifying our environmental standard review plan.

That is something that we'll look at in the future, how we're going to address future disturbances.

COMMISSIONER BARAN: So going forward, you wouldn't use the same approach to consultation on this issue that you used here?

MS. HERRITY: No, that is correct. We would not do it the way we did it before.

COMMISSIONER BARAN: After an NHPA consultation was concluded, did the staff contact the Florida SHPO to notify them that the Levy project could include an ISFSI?

MS. SUTTON: Yes, we did.

COMMISSIONER BARAN: And why did the staff

do that?

MS. SUTTON: The staff and management with the -- with some of the staff members who had raised some concerns wanted further outreach to ensure that the SHPO was a way and to just ensure that what we consulted on on the project was still sufficient and valid.

And during our discussion, they had said that what we have done, because the whole site was consulted on and there was provisions for future disturbance.

The consultation was still concluding.

COMMISSIONER BARAN: Okay. And did the staff think that this call -- it was a phone call?

MS. SUTTON: Yes, sir.

COMMISSIONER BARAN: Did the staff think that this call was necessary to comply with the NHPA?

MS. SUTTON: We -- based on the process for historic preservation, and even the letter that came in yesterday, we have complied and concluded consultation.

But, since there was some concerns raised that maybe we wanted to just ensure that they were aware that there would be future disturbance and they felt like what was in place was fine.

COMMISSIONER BARAN: Okay.

And so, and the call with the Florida SHPO, or SHPO staff, can you give me a little bit of granularity on what the staff told the SHPO?

MS. SUTTON: Well, since I made the call with the --

COMMISSIONER BARAN: Okay, well, you would know.

MS. SUTTON: Yes.

We explained to them that we're getting ready for the mandatory hearing and we wanted them to know that there would be a possibility of a spent fuel nuclear facility that may be built onsite.

And the question was asked, well, what was the 8th? And we explained to him that 8th was the entire project site that we consulted on. Then he said he had to go back, he was going to copy us to review the -- review the notes and our project information.

And then he came back and said that, based on our previous consultation, that we were still in good standing and a thank you and look forward to working with us in the future.

COMMISSIONER BARAN: Okay. So, the SHPO wasn't concerned?

MS. SUTTON: No, sir. He was not concerned.

COMMISSIONER BARAN: Okay. But just to be clear, though, this discussion of the ISFSI license occurred after consultation with the SHPO was complete?

MS. SUTTON: Yes.

COMMISSIONER BARAN: Okay. And just to understand the significance of this issue, or maybe lack of significance of it, as I understand it, the NHPA consultation is about ground disturbance and the impact on historic and cultural resources.

Based on your conversations with Florida SHPO and others, for a SHPO, does it matter what is being constructed? Or, is the size of the area of disturbance really all that matters to a SHPO?

MS. SUTTON: I can't make assumptions, but I know when we consult, we consult on the entire site.

So, let's say, for instance, if we had just consulted on the acres for Levy and we were planning to -- they're planning to build an ISFSI somewhere else on the site, then we'll then -- we'll definitely have to consult on that particular activity.

But, the way we do our NEPA review, we try

to consult on the entire site. So, once they're aware of the surveys and aware of what maybe there, then they're comfortable that, based on their regulations, that they put provisions that any future activity, it doesn't matter what it is, the ISFSI could be building a road, that is covered under what we consulted on. So, it does matter for them.

COMMISSIONER BARAN: Okay. So, here, you consulted on the entire site?

MS. SUTTON: Yes, sir.

COMMISSIONER BARAN: And your understanding is that, for the purposes of a SHPO, whether it's a spent fuel pad or a parking lot, doesn't really matter. Because, the issue is disturbance of the land?

MS. SUTTON: Yes.

COMMISSIONER BARAN: Okay.

MS. SUTTON: A protection of the resource if something is found.

COMMISSIONER BARAN: Okay. And so, and we talked about this a little bit and kind of fleshed out the issue, and so, what I'd ask you to do is just take 30 seconds or a minute or however long you want, and just explain the staff's view about why what was done here was adequate to meet the requirements of NHPA,

even though there was no explicit specific discussion during consultation of the ISFSI general license that would accompany the COL?

MS. SUTTON: Well, what we did in Chapter 6 of the FEIS, we incorporated by reference the license renewal guides on spent fuels, spent nuclear fuel on the site. And then, so, that was in Chapter 6.

And then we also did a new review on the continued storage and spent fuel of the license life. And, both times, the staff found that the spent fuel, if needed, I believe, the site would be small.

So, based on that review, the staff felt that we adequately addressed.

COMMISSIONER BARAN: But, the NEPA requirement to analyze environment impacts is separate from the NHPA requirement to consult, right?

MS. SUTTON: Yes, but we do our National Historic Preservation Act under the NEPA review.

COMMISSIONER BARAN: Okay.

CHAIRMAN BURNS: Identify yourself and --

MR. FLANDERS: Hi, my name is Scott Flanders, the Director of Division Site Safety and Environmental Analysis. I have been sworn in.

I think I understand your question,

Commissioner Baran, it goes to why we believe our consultation activity was complete, based on what we did.

When we consult, as Mallecia was indicating, we consult on the entire project, so it's an area potential effect that we consider.

And then, looking at the area potential effect in the consultation with the SHPO, we talk about the potential construction operation in that area.

As you well pointed out, it's really focused on the potential historic cultural properties, independent of what's going to cause the disturbance, but the potential to disturb them and how you could potentially either mitigate or avoid that disturbance.

And that's the focus of the consultation activity, independent of the temporal aspect of when that occurs, that the focus of the consultation.

And in doing that consultation activity for the Levy site, we had to have those discussions. We believe that our consultation activities along with our understanding of the procedures put in place by the applicant, we came away believing that the resources were adequately protected.

COMMISSIONER BARAN: Okay, thank you.

Let me just ask about a couple other issues.

I wanted to follow up on the pre-hearing questions 35, 37, 38 which addressed the wetland mitigation plan that Duke issued in September 2015.

As you mentioned, the revised plan includes the clearing and excavation of 91 acres of upland habitat for the purposes of wetland creation.

The staff explained that the revised plan did not require a supplementation of the final EIS because it did not constitute new and significant information.

How did the staff conclude that the conversion of 91 acres of land into wetlands did not meet the significance threshold for supplementation?

MS. SUTTON: I would like to call on my biologist who did the actual analysis to explain that to you.

Can I have Peyton Doub to the stand, please?

COMMISSIONER BARAN: Thanks.

MS. SUTTON: Thank you.

MR. DOUB: My name is Peyton Doub. I'm a terrestrial ecologist and wetland scientist with the Office of New Reactors. And I have been sworn in.

CHAIRMAN BURNS: Okay, please proceed.

MR. DOUB: I performed the analysis, the new and significant analysis of the revised wetland mitigation plan which did call for the conversion of 91 acres of uplands, i.e., non-wetlands, on the Levy site to wetlands as part of the mitigation.

As part of that effort, I visited the site, had discussions with the applicant and with the Corps of Engineers and reviewed the relevant documentation.

As a result of that review, I determined, based on my experience as a wetland scientist, that the nature of the conversion of these uplands was less like a development project, less like the excavation associated with development and more like the excavation associated with the conservation project, relatively shallow, done in a way to prepare not only for greater wetland hydrology, i.e., greater wetness, but also to prepare a planting bed for planting native wetland vegetation.

All of the affected upland areas are planted pine plantations that have been intensively managed for silviculture for the last several decades.

None of these habitats or the regionally unique upland sand hill type habitats that are favored

by the threatened and endangered species that we had to address in the biological assessment and response to the -- and the biological opinion and incidental take statement.

Based on this, I concluded that the changes to the wetland mitigation plan involving the 91 acres of upland represented an improvement to the wetland mitigation plan that is in the spirit of wetland mitigation and not further impacts requiring a supplemental environmental impact analysis.

Thank you.

COMMISSIONER BARAN: Thanks.

I think that answers my question on that.

Let me just follow up on pre-hearing question 43.

The hawksbill turtle is listed as endangered under the Endangered Species Act. I would like to ask, but I'm not going to, if a hawk does not have bill and turtle doesn't have bill, how it's a hawksbill turtle? I'm not going to ask you that. I would like to know, but I'm not going to ask it.

Can you walk us through how the staff determined whether the hawksbill turtle is present at the Levy site? There's already movement.

MS. SUTTON: I guess -- here he comes.

CHAIRMAN BURNS: Identify yourself.

MR. MASNIK: Mike Masnik, I'm an aquatic ecologist and, yes, I've been sworn in.

The hawksbill turtle is one of four or five turtle species that are typically found in tropical waters around Florida.

It had, turns out, they have been captured and identified one specimen a number of years ago. And it is not typically found in those waters.

The more common species is the green turtle and the loggerhead which are the species that are typically found at -- used to be collected at the Crystal River Energy Center.

COMMISSIONER BARAN: And just at a high level, though, how did the staff determine that this wasn't a location where you would expect to see this species of turtle? Was it related to the work that had been done in Crystal River? Was there something separate done?

MR. MASNIK: Exactly.

COMMISSIONER BARAN: So, Crystal River is like less than ten miles away.

MR. MASNIK: Crystal River has a biological opinion and requires the collection of data of species of turtle captured on the intake screens.

And there was one specimen taken during the period of sampling.

COMMISSIONER BARAN: And that specimen was at Crystal River?

MR. MASNIK: Yes, that's correct.

COMMISSIONER BARAN: Okay. And did that raise any concerns about the prior conclusions about the presence of that turtle species in the area?

MR. MASNIK: No, we think that was just an unusual occurrence. Typically, we do not see hawksbill turtles captured at power plants.

COMMISSIONER BARAN: Okay, thank you.

Thank you, Mr. Chairman.

CHAIRMAN BURNS: Okay. All right, thank the panelists here for their presentations and the discussion here on the environmental matters.

We'll proceed to then the closing statements from the applicant and the staff.

We'll take a moment here to clear the table.

All right, thanks everyone. We've now come to the opportunity for closing statements from the Applicant and from the staff. And we'll start with the Applicant.

Mr. Fallon?

MR. FALLON: Thank you. Thank you, Mr. Chairman and Commissioners.

Thank you for your time and effort that you put in preparing and conducting this hearing. We appreciate your insights and questions and we will 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 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 conclusions that the AP-1000 is safe. The environmental considerations have been addressed and the Commission has the information necessary to make the required findings for the issuance of the Levy COL.

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

Our Duke team, the Joint Venture team and the Westinghouse team combined have invested several hundred thousand man-hours to prepare the COL application and to complete the COLA review.

Duke Energy fully supports the standard design approach. We have benefitted from the lead plant application and the construction activities and think that our experience will also benefit supplicant applications.

It should be no surprise that with the new design, there are emergent issues that must be addressed. We believe that the benefits of a certified and standard design will not be fully realized until the completion of the first of the kind construction currently in progress.

Our work to address emergent industry issues and the AP-1000 specific issues has not reduced our confidence in the AP-1000 design and the significant value of the passive safety systems.

Obtaining the Levy COL is key to Duke Energy Florida's ability to meet future generation requirements.

Our planning identifies the need for baseload generation that support the addition of the Levy plants in the 10 to 20 year horizon.

The generation fuel mix for Duke Energy Florida is currently approximately 80 percent natural gas and that number is growing.

Additionally, we face uncertainty

regarding the impact of carbon limitations. A COL minimizes the construction risks and provides us the ability to implement 2,200 megawatts of new nuclear generation five to seven years earlier than otherwise would be able to.

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

The company will make a final decision on new nuclear generation in Florida in the future based upon, among other factors, energy needs, project costs, carbon regulation, natural gas prices, existing or future legislative provisions on 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 Levy Unit 1 and 2 combines license application.

CHAIRMAN BURNS: Thank you very much.

For the staff? Wheel on up.

MS. UHLE: So, again, thank you, Chairman Burns.

Just to introduce this panel, my name is

Jennifer Uhle. I'm the Director of the Office of New Reactors.

With me on this panel, Frank Akstulewicz to my right and Sam Lee to my left.

Before I start my remarks, I would like to take the opportunity to correct the record. I misspoke during the first panel. And I indicated that the staff had devoted 83 hours to the review of the combined license.

We are not quite that efficient. It was written down and I guess I skipped right over that 83,000 hours. So, hopefully, that sets the record straight.

CHAIRMAN BURNS: Well, without objection, we'll -- I note the corrections.

MS. UHLE: Okay. Thank you. And I apologize for any confusion that may have caused. 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 environmental impact statement, and in our presentations to you today 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 the Levy Nuclear Plant Units 1 and 2.

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

I will take this moment to acknowledge the adjective that Mr. Fallon provided both an exhaustive review and indicate that we certain agree with that.

The review was appropriately focused by the finality accorded to issues within the scope of the AP-1000 design certification.

The staff has demonstrated the thoroughness of our review in part through its reliance on staff guidance and interaction with the Advisory Committee on Reactor Safeguards.

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

Today, we highlighted certain aspects of our safety and environmental reviews. We explained that the staff's evaluation of the geologic and geotechnical characteristics of the site and the design of the roller compacted concrete below the

foundation.

We explained how the staff analyzed the applicant's request for an exemption from the AP-1000 certified design relating to a design change to the common state return portion of the passive heat removal system.

During the staff's environmental panel, we discussed the biological opinion by the U.S. Fish and Wildlife Service and the evaluation of the alternative sites.

We also highlighted our process for compliance with 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 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 Commission's 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 process and practices.

We have verified that there is an established process by which the licensee maintains commitments, implements changes and we, of course, oversee these changes, if any are made.

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

This concludes the staff's presentation.

CHAIRMAN BURNS: Okay, thank you.

We've now reached the point for final questions and closing remarks.

And the Commission, I think we'll start out with any final questions.

Commissioner Svinicki, do you --

I just -- I have two. Then, first, Jennifer sort of prompted this question is with

respect to corrections, I take it there are no other obvious corrections that the staff would like to make to its presentations at this time?

MS. UHLE: There are a few corrections that we'd prefer to make during the review of the transcript, if possible.

CHAIRMAN BURNS: Okay, that's fine. And I'll get to that sort of procedural aspect about corrections to the transcript.

I'll ask, again, the Applicant, Duke, whether any particular matters they want to elaborate on?

MR. KITCHEN: No, we have no corrections to the previous responses.

CHAIRMAN BURNS: Okay. And as I say, I'll get to the point, we'll talk about potential transcript corrections.

The one final question I had is, I'm aware that yesterday that the Florida SHPO submitted to the docket, and just that's really just submitting to the docket, a letter. It's a letter from Timothy Parsons who's the Director of Division of Historical Resources and the State Historic Preservation Officer just commenting that, generally, the consultation had been concluded and that he looked forward to future work as

necessary with the staff.

My question, I think, for staff counsel, is this letter part of your exhibit list? Is this -- has this been admitted?

MR. ROACH: Kevin Roach for the NRC staff.

No, since it was received yesterday, we have not --

CHAIRMAN BURNS: Okay.

MR. ROACH: -- submitted it as an exhibit, but we can do so if you would --

CHAIRMAN BURNS: Well, my questions on docket, it may well be, you know, without objection, I would ask that it be admitted. But, it may be more appropriate for you to do so. I'll leave to you all the procedural thing.

But, I think, you know, given, I think, we had a good discussion on the consultation, knowing that we had this letter, and I know Ms. Sutton spoke to the oral, I think, in response to Commissioner Baran's questions, the oral exchange.

But, I think it's useful if we have this -- knowing this particular letter, to have it on the record for the mandatory hearings. So, I might suggest that you do or submit that with your post-hearing statement.

MR. ROACH: We can certainly do that.

CHAIRMAN BURNS: Because I'd like to see that there. Okay?

That's all I have.

Any closing remarks, Commissioner Svinicki?

COMMISSIONER SVINICKI: Well, I would just like to commend the professionalism and the competency demonstrated by all of the witnesses, both those at the table and any who came to the microphone today.

By my note, although we may have some supplementation or correction in the record, I don't -- I didn't note that there were any issues that the Commission raised that there was not some extremely knowledgeable person sworn in and ready to come to the microphone to provide some sort of response or supplementation to the record on that topic.

And, speaking for myself, in reviewing the record and the response to the pre-hearing questions, was impressed by the amount of work and analysis. Any issue or question that I had, I was able to either find in the record or receive, in response to the pre-hearing questions, something very in depth and fulsome. And the issues that I thought I had identified, I think I have probed and been very

satisfied.

That being said, I may, of course, upon consideration of this hearing and study of the transcript, identify post-hearing questions. If I do, I will submit those through the process that the Chairman will describe.

But, again, I think all of us representing NRC here today know that compliance with our requirements yields a very safe utilization and harnessing of nuclear powered operating sites.

The AP-1000 and advanced reactors, of course, provide a measure of possible safety that is beyond what we have today. When I marry that with the very thorough environmental evaluation that's going on, I think it provides a very rich and comprehensive record with regard to the Levy application.

So, I look forward, as the Chairman said, to deliberating as a body and, in a timely way, but with due consideration to the complexity of the issues arriving at a Commission decision on the issuance of these licenses.

Thank you, again, to all the participants.

Thank you, Mr. Chairman.

CHAIRMAN BURNS: Thank you, Commissioner.

Commissioner Baran?

COMMISSIONER BARAN: I just want to add my thanks to the NRC staff and all of our participants today for you hard work throughout the review of this application.

I found everyone's preparation for today's hearing to be just apparent throughout the day.

I found the hearing to be very valuable and thank you, again.

CHAIRMAN BURNS: Thank you, Commissioner. And I'll first start with the instructions for what you may expect in the near future.

We will have a deadline for responses to post-hearing questions. It will likely be August 11, 2016, unless we direct otherwise.

You will know what to address because we expect to have the secretary issue and order with any post-hearing questions by August 4, 2016. And we'll set the time, the final time for response in that order.

We will also give an opportunity for transcript corrections which I expect to be August 9, 2016. The secretary will plan to issue an order requesting proposed transcript corrections by August 2, 2016. And, of course, you would have the transcript available in order to inform us whether

there are any transcript corrections that need to be made.

And, as we've said before, and Commissioner Svinicki reiterated, we would expect to issue a final decision in this matter promptly with due regard to the complexity of the issues.

I want to add my thanks to both the applicant and the NRC staff who have appeared before us today or have worked hard in the back rooms or where ever they may be in providing the information that's necessary to support an application like this and for conducting the review, both on the safety and on the environmental side.

It's no small undertaking, and as Director Uhle has informed us, it's much more than 83 hours, where ever it is.

I also, though, I want to express my thanks to the Office of the Secretary who helps manage us through the proceedings, maintaining the docket and taking care of that.

And, finally, the Office of Commission Appellate Adjudication led by Brooke Poole. And I think Susan Spicer's -- Brooke Clark, excuse me, Brooke Poole-Clark -- who leads that office.

This actually marks the 25th anniversary

of the Office of Commission Appellate Adjudication which was formed in 1991. I hate to say it, I was the first Director.

But, one of the things the Commission did in establishing OCAA was provide for an for an office that helps us in preparing, not only for the appeals that we have to determine from a licensing board decisions, but in more recent years, to help us through the process of conducting these mandatory hearings. And they've done an excellent job with that. So, I want to express my thanks to them as well.

And, with that, I appreciate, again, your attendance here.

We are adjourned.

(Whereupon, the above-entitled matter went off the record at 2:20 p.m.)

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
PROGRESS ENERGY FLORIDA, INC.	)	Docket Nos. 52-029-COL
	)	and 52-030-COL
(Levy County Nuclear Power Plant	)	
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 Clara Sola]
Office of the Secretary of the Commission

Dated at Rockville, Maryland
this 2nd day of August, 2016