UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of DOMINION VIRGINIA POWER (North Anna Power Station, Unit 3)	Docket No. 052-017-COL

ORDER
(Setting Deadline for Proposed Transcript Corrections)

The Commission held an evidentiary hearing on March 23, 2017, 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 April 4, 2017. 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 28th day of March, 2017.

Official Transcript of Proceedings

NUCLEAR REGULATORY COMMISSION

Title: Hearing on Combined License for North Anna Nuclear Plant, Unit 3: Section 189a of the Atomic Energy Act

Docket Number: N/A

Location: Rockville, Maryland

Date: March 23, 2017

Work Order No.: NRC-2964 Pages 1-163

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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HEARING ON COMBINED LICENSE FOR NORTH ANNA NUCLEAR PLANT, UNIT 3: SECTION 189a OF THE ATOMIC ENERGY ACT

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THURSDAY,

MARCH 23, 2017

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ROCKVILLE, MARYLAND

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

COMMISSION MEMBERS:

KRISTINE L. SVINICKI, Chairman

JEFF BARAN, Commissioner

STEPHEN G. BURNS, Commissioner

ALSO PRESENT:

ANNETTE VIETTI-COOK, Secretary of the Commission
MARGARET DOANE, General Counsel

NRC STAFF:

FRANCIS AKSTULEWICZ, Director, Division of New Reactor Licensing (DNRL), Office of New Reactors (NRO)
ANNA BRADFORD, Deputy Director, DNRL, NRO
MARCIA CARPENTIER, Office of the General Counsel
MANAS CHAKRAVORTY, Structural Engineer, Division of Engineering, Infrastructure, and Advanced Reactors (DEIA), NRO
VLADIMIR GRAIZER, Geophysicist, Division of Site Safety and Environmental Analysis (DSEA), NRO
VONNA ORDAZ, Acting Director, NRO
JAMES SHEA, Project Manager, DNRL, NRO
AARON "MATT" THOMAS, Engineer, Division of Safety Systems and Risk Assessment (DSRA), NRO

ALSO PRESENT:

REGINA BORSH, Dominion Consulting Engineer

MARK GILES, Director, Nuclear Project Technical Support, Dominion Virginia Power

JOSEPH HEGNER, Licensing Manager, Dominion Virginia Power

DAVID HINDS, GE-Hitachi

DAVID R. LEWIS, Pillsbury Winthrop Shaw Pittman

JAMES MARRONE, Senior Seismologist/Geophysicist, Manager of Seismology and Geophysics, Bechtel Corporation

MARK MITCHELL, Vice President, Generation Construction, Dominion Virginia Power

LUBEN TODOROVSKI, Principal Engineer, Civil Engineering, GE Hitachi Nuclear Energy

JOHN WADDILL, Dominion Consulting Engineer

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P R O C E E D I N G S

9:01 a.m.

CHAIRMAN SVINICKI: I call the hearing to order.

Good morning everyone. I have to have a little bit more active today than I've had in these in the past. But, I'm going to charge in. I've had expert people to observe.

So, I want to welcome Dominion Virginia Power, the NRC staff, members of the public in the room with us and those who are tuning in remotely on the Internet.

The Commission convenes today to conduct an evidentiary hearing on Dominion Virginia Power's application for a combined license to construct and operate a new nuclear power unit at a site in Louisa County, Virginia.

This hearing is required under Section 189a of the Atomic Energy Act of 1954 as Amended.

The Commission also will be reviewing the adequacy of the NRC staff's Environmental Impact Analysis under the National Environmental Policy Act of 1969, also referred to as NEPA.

The general order of this hearing is as follows, first, I will address procedural matters

associated with the swearing in of witnesses and the admission into the record of the parties exhibits.

Dominion and the NRC staff will then provide testimony in witness panels that provide an overview of the application as well as address safety and environmental issues associated with its review with Commission questions following each panel.

The Commission expects to issue a decision after the hearing promptly with due regard to the complexity of the issues after it makes the following necessary findings.

On the safety side, the Commission will determine, one, whether the applicable standards and requirements of the Atomic Energy Act and the Commission's regulations, specifically those in 10 CFR Section 52.97, have been met.

Two, whether any required notifications to other agencies or bodies have been duly made.

Three, whether there is reasonable assurance that the facility will be constructed and will operate in conformity with license, the provisions of the Atomic Energy Act and the NRC's regulations.

Four, whether the applicant is technically and financially qualified to engage in the activities

authorized.

And, five, whether issuance of the license would be inimical to the common defense and security or to the health and safety of the public.

On the environmental side, 10 CFR Section 51.107a, the Commission will, one, determine whether the requirements of the National Environmental Policy Act Section 102.2a, c, and e and the applicable regulations in 10 CFR Part 51 have been met.

Two, independently consider the final balance among the 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, on the basis of the environmental review, be issued, denied or appropriately conditioned.

And, four, determine whether the NEPA review conducted by the NRC staff has been adequate.

This meeting is open to the public and we do not anticipate the need to close the meeting to discuss nonpublic information.

If a party believes that the response to

a question may require a reference to nonpublic information, then that party should answer the question to the extent practicable with information in the publically available record and file in a nonpublic response promptly after the hearing on the nonpublic docket.

At this point, I would like to ask my fellow Commissioners whether they have any opening remarks.

Commissioner Baran?

COMMISSION BARAN: Thank you, Chairman.

I just want to join you in welcoming everyone and thanking the witnesses from the staff and from Dominion for all of the work that led to today.

This is the sixth uncontested hearing we've had during my time on the Commission. I think that's true for Commissioner Burns, too.

Second one involving the ESBWR reactor design.

But, it's my first hearing where the applicant has an early site permit, so that's a little different.

I'm looking forward to hearing everyone's presentations and the Q&A.

Thanks.

CHAIRMAN SVINICKI: Thank you.

Okay. We will now proceed with the swearing in of witnesses beginning with Dominion. Counsel, please introduce yourself.

MR. LEWIS: My name is David Lewis, I'm with the law firm Pillsbury Winthrop Shaw Pittman, and I have the privilege of representing Virginia Electric and Power Company.

CHAIRMAN SVINICKI: Thank you.

Would you please read the names of Dominion's witnesses and each witness should stand as her or his name is read.

MR. LEWIS: Yes, Mark D. Mitchell, Mark A. Giles, Joseph D. Hegner, Regina A. Borsh, John Waddill, Keith J. Miller, Louis T. Banks, James E. Marrone, Luben I. Todorovski.

CHAIRMAN SVINICKI: Okay, thank you.

I would now ask the witnesses to please raise their right hands while I read the oath.

Do you swear or affirm that the testimony you will provide in this proceeding is the truth, the whole truth and nothing but the truth?

(CHORUS OF I DO'S)

CHAIRMAN SVINICKI: Are there any witnesses who did not take the oath?

(NO RESPONSE)

CHAIRMAN SVINICKI: Hearing none, all of you then have taken the oath.

Are there any objections to including the witness list as part of the record?

MS. CARPENTIER: There are not.

CHAIRMAN SVINICKI: In the absence of objections, the witness list is admitted into the record.

Next, we will turn to Dominion's exhibits. Counsel, are there any changes to your exhibits list?

MR. LEWIS: No, there are not.

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

MR. LEWIS: Yes, Dominion's exhibits are numbered DVP001R and DVP002 through DVP014.

CHAIRMAN SVINICKI: Is there a motion to admit the exhibits into the record?

MR. LEWIS: Yes, so moved.

CHAIRMAN SVINICKI: Are there any objections to the admission of the exhibits and the exhibit list as part of the record?

MS. CARPENTIER: There are not.

CHAIRMAN SVINICKI: In the absence of objections, the exhibits and exhibit list are admitted

into the record.

Thank you, the witnesses may be seated.

We will now turn to the presentation of the staff witnesses. Counsel, please introduce yourself.

MS. CARPENTIER: Thank you.

My name is Marcia Carpentier. I'm with the NRC Office of General Counsel and I am Counsel for the NRC staff.

We have some changes to our witness list and I was wondering how you would like me to proceed with those? Should I mention the additions first?

CHAIRMAN SVINICKI: Maybe that would be helpful because that would highlight them. But, again, you will be asked to read the entire list of names of the staff's witnesses.

MS. CARPENTIER: Yes, yes, thank you.

Additions are Emil Tabakov and Richard Turtil of the Office of Nuclear Reactor Regulation and Richard Clement, Joe Ashcraft, Nilesh Chokshi and Lauren Kent from NRO.

CHAIRMAN SVINICKI: Okay. And, I would ask those witnesses to stand. Thank you.

And, would you continue with the remainder of the list?

MS. CARPENTIER: Thank you.

Frank Akstulewicz, Aaron Armstrong, Merritt Baker, Dan Barss, Laurel Bauer, Anna Bradford, Robert Caldwell, Andy Campbell, Mark Caruso, Manas Chakravorty, Nan Chien, Christopher Cook, David Curtis, Antonio Dias, Joe Donoghue, James Downs, Michael Dusaniwskyi, Michael Eudy, Robert Fitzpatrick, Joseph Giacinto, James Gilmer, Vladimir Graizer, Michelle Hart, Brad Harvey, David Heeszel, John Honcharik, James Kellum, Rebecca Karas, Chang Li, Timothy Lupold, Matthew Mitchell, Lynn Mrowca, Ruthanne Murray, Bruce Musico, Jinsuo Nie, James O'Driscoll, Vonna Ordaz, Sunwoo Park, Raju Patel, Judy Petrucelli, Thomas Pham, Kevin Quinlan, Sheila Ray, Eduardo Sastre, James Shea, Alice Stieve, Angelo Stubbs, Edward Stutzcage, Allbert Tardiff, Aaron Thomas, Christopher Van Wert, George Wang, Weijun Wang, Stephen Williams, Yuken Wong, Zuhan Xi, Jim Xu, Jack Cushing, Jennifer Davis, Peyton Doub, Tamsen Dozier, Kenneth Erwin, Stacey Imboden, Andrew Kugler, Phil Meyer, Dan Mussatti, Donald Palmrose, and Mallecia Sutton.

CHAIRMAN SVINICKI: Thank you.

And, if I could ask if any of the witnesses are entirely blocked from view by this port

post, could you please just step the right or left so that you could see me. Thank you.

Please raise your right hand while I read the oath.

Do you swear or affirm that the testimony you will provide in this proceeding is the truth, the whole truth and nothing but the truth?

(CHORUS OF I DO'S)

CHAIRMAN SVINICKI: Are there any witnesses who did not take the oath?

Okay, you may be seated.

Are there any objections to including the witness list as part of the record?

MR. LEWIS: No objection.

CHAIRMAN SVINICKI: In the absence of objections, the witness list is admitted into the record.

We will now turn to the staff's exhibits. Counsel, are there any changes to your exhibit list?

MS. CARPENTIER: There are not.

CHAIRMAN SVINICKI: Please read the range of numbers of the exhibits to be admitted.

MS. CARPENTIER: NRC001 through NRC012.

CHAIRMAN SVINICKI: Is there a motion to admit the exhibits into the record?

MS. CARPENTIER: There is.

CHAIRMAN SVINICKI: Are there any objections to the admission of the exhibits and the exhibit list into the record?

MR. LEWIS: No objection.

CHAIRMAN SVINICKI: In the absence of objection, the exhibits and exhibit list are admitted into the record.

Okay, thank you for those procedural matters.

We will now turn to the first panel. For our first presentation, Dominion will provide an overview of its application.

After each overview panel, we will have a round of questions from the Commissioners.

For the two subsequent presentations, the safety panel and the environmental panel, first, Dominion and then the staff will testify followed by an opportunity for Commission questions of both parties.

The Commissioners will have an opportunity to bank their time as they see fit to focus on particular questions and we will rotate the order of questioning throughout the day.

I remind the witnesses that they are under

oath. And, if an individual needs to come to the podium to respond to a question or otherwise speak, please approach the podium and wait to be addressed and if you have not previously been sworn in, please wait to be sworn in.

Thank you.

I would begin by asking the panelists to please introduce themselves again.

MR. MITCHELL: Good morning, Chairman Svinicki, Commissioner Burns and Commissioner Baran. My name is Mark Mitchell, I am Vice President, Generation Construction for Dominion Virginia Power.

CHAIRMAN SVINICKI: Thank you.

MR. GILES: Mark Giles, Dominion. I'm the Director for Technical Support.

MR. HEGNER: Joe Hegner, Licensing Manager for Dominion.

CHAIRMAN SVINICKI: Thank you.

Please proceed with your presentation.

MR. MITCHELL: Thank you.

Again, my name is Mark Mitchell and I am Vice President, Generation Construction for Dominion Virginia Power and the Executive Officer responsible for the company's North Anna 3 Unit project.

I am very pleased to appear before you

today in this hearing on the issuance of a combined construction permit and operation license for North Anna Unit 3.

This hearing is the culmination of considerable effort by both Dominion and the NRC staff to thoroughly analyze, demonstrate and document the proposed unit is protected for the public health and safety consistent with National Environmental Policy Act and complaint with the NRC Safety and Environmental regulations.

Let me start with a few words about Dominion Virginia Power, which is the applicant for the combined license.

Slide two, please?

Dominion Virginia Power whose legal name is Virginia Electric and Power Company is a regulated public utility that currently serves approximately 2.6 million electric customers located in Virginia and North Carolina.

The company supply side portfolio consists of approximately 21,665 megawatts of generation capacity and its operating revenues in 2016 were approximately $7.6 billion.

Dominion Virginia Power is a subsidiary of Dominion Resources, Incorporated, or Dominion.

Dominion is one of the nation's largest producers and transporters of energy. Dominion's strategy is to be the leading provider of electricity, natural gas and related services to customers primarily in the Eastern and Rocky Mountain regions of the U.S.

Dominion's portfolio of assets at the end of 2016 includes approximately 26,400 megawatts of generating capacity, 6,600 miles of electric transmission lines, 57,600 miles of electric distribution lines, 14,900 miles of natural gas transmission gathering and storage pipeline and 51,300 miles of gas distribution pipeline.

Dominion serves over 6 million utility and retail energy customers and operates one of the nation's largest underground natural gas storage system with approximately 1 trillion cubic feet of storage space.

Dominion has approximately $71 billion in total assets and the operating revenue in 2016 of nearly $12 billion.

Dominion Virginia Power has approximately 50 years of experience with construction and the operation of nuclear power plants. It currently operates two baseload units at the Surrey Power

Station and two baseload units at the North Anna Power Station.

In addition, it's sister company, Dominion Nuclear Connecticut operates two units at the Millstone Power Station in Connecticut. And, until recently, another sister company operated the Kewaunee Power Station is Wisconsin.

The nuclear operation at these units is supported by a strong, cohesive corporate nuclear organization.

Dominion's nuclear performance has been exemplary. As an example, the U.S. nuclear industry's three-year capacity factor averaged 91.3 percent from 2012 through 2015.

During the same period, our nuclear fleet performance was 92.9 percent. In 2016, the fleet capacity factor was 93.3 percent.

As indicated, Dominion has consistently exceeded the industry average capacity factor.

In short, Dominion Virginia Power is well qualified to construct and operate North Anna Unit 3.

Slide five, please?

In its 2016 integrated resource plan, Dominion Virginia Power projects that its annual summer-adjusted capacity requirements will increase by

4,457 megawatts over the next 15 years, while its annual-adjusted energy requirements will increase by about 20,700 gigawatt hours.

As shown on slide five, there is a substantial capacity gap that needs to be filled. Issuance of the COL for North Anna Unit 3 will provide a very valuable option for meeting this need.

The landscape for electric generation is changing rapidly. The U.S. Environmental Protection Agency's Clean Power Plan, if upheld following pending court challenges, would require the Commonwealth to reduce its carbon emissions significantly.

The costly clean power plant is currently under judicial review. Dominion Virginia Power has not yet selected a preferred means of compliance, but instead, has included a number of options in its current integrated resource plan including one option under which North Anna 3 would be in service by the end of 2028.

Issuance of the COL provides great certainty regarding the availability of this option and will allow Dominion Virginia Power to move forward expeditiously if and when a decision is made.

Even with the exact future of the clean power plan undetermined at present, Dominion Virginia

Power believes that future regulation will require it to address carbon and carbon emissions in some form beyond what is required today.

Therefore, it is critical to preserve all options available that will help to ensure that Dominion Virginia Power, its customers and the Commonwealth of Virginia can effectively transition to a low carbon future while maintaining reliability and protecting against price volatility and over reliance on any single fuel source.

In conclusion, Dominion Virginia Power's continued development of North Anna 3, will help to ensure that the supply side resource option remains available to its customers.

Nuclear power offers proven operational economic and environmental benefits and this project is an important resource for our customers in terms of reliability and fuel diversity and as an option to comply with the clean power plan or other initiatives to reduce carbon emissions.

Nuclear units provide 24 by 7 emission-free dispatchable generation and North Anna 3 will enhance fuel diversity within Dominion Virginia Power's generation portfolio which will, in turn, promote fuel price stability for customers.

If constructed, the ESBWR unit would provide our customers with an additional 1,500 megawatts of nuclear generated electricity.

I will now turn the presentation over the Mark Giles who is Director, Nuclear Project Technical Support for the North Anna 3 Project and Joseph Hegner who is the Licensing Manager for the North Anna 3 project who will provide an overview of the proposed unit and its licensing.

MR. GILES: Thank you, Mark.

And, slide six, please?

Good morning, Chairman Svinicki and Commissioners Burns and Baran. My name is Mark Giles. I am the Director and Nuclear Project Technical Support and have overall responsibility for the North Anna Unit 3 combined license application, associated design engineering and related state and federal permits and approvals.

Dominion's North Anna site is located in Louisa County, Virginia, approximately 40 miles north, northwest of Richmond.

This is a very good location for the new unit as the site is positioned between heavy load centers in northern Virginia and the surrounding Richmond and Charlottesville areas.

The site is about 1,043 acres and was originally planned for four units with Units 1 and 2 constructed in the 1970s, followed by commercial operation in 1978 and 1980.

Slide seven, please?

This is an aerial photograph of the existing site with the Unit 3 rendering shown on the site to approximate scale. Unit 3 is in light blue located generally west of Units 1 and 2 on the right, with a cooling tower shown west of Unit 3.

Currently, Units 1 and 2 are in operation with both units having gone through license renewal.

With the selected GEH ESBWR technology, Unit 3 would occupy about 133 acres within the existing North Anna site. The site also contains an independent spent fuel storage installation. That license is currently in the NRC license renewal process.

Lake Anna, a manmade lake on property owned by Dominion provides cooling water for Units 1 and 2 and the lake with provide non-safety related make up for Unit 3, but is not needed for any safety related cooling in Unit 3.

The lake is approximately 17 miles long with 200 miles of shoreline.

Slide eight, please?

Dominion selected the GEH Economic Simplified Boiling Water Reactor, or ESBWR design, for Unit 3. This is a standardized design which the NRC certified by rule effective in November 2014.

This design was one of two advanced reactor designs that were developed as part of the U.S. Department of Energy's Nuclear Power 2010 Program.

The ESBWR is a Generation III+ boiling water reactor that produces 4,500 megawatts of thermal energy and approximately 1,500 megawatts of electricity.

The ESBWR design incorporates passive safety and natural circulation such that no AC power nor operator action is required for at least 72 hours following a design basis event.

It has a robust seismic design envelop and a very low core frequency.

Now, I would like to turn the presentation over to Joe Hegner for a discussion of the COLA.

MR. HEGNER: Chairman, Commissioners, good morning.

In my presentation, I will describe the North Anna 3 COLA, highlight some differences from the

DCD, how we standardized with the reference COLA, describe how we took advantage of our early site permit and, lastly, tee up the topics to be addressed during the safety and environmental panels that follow.

Slide nine, please?

For more than a decade, Dominion has exercised the Part 52 process and found it to be both robust and flexible.

We submitted a COLA for an ESBWR at the North Anna site designated as Unit 3 in November of 2007. The North Anna 3 COLA referenced in early site permit application we had previously submitted in September of 2003.

That early site permit application used a planned parameter envelop approach.

The PPE served as a surrogate for a reactor technology since, at the time, Dominion had not made a technology decision.

The NRC issued the early site permit in November of 2007.

We revised the COLA on two occasions to change technologies. Originally, the COLA referenced the ESBWR. Dominion changed to the US-APWR in 2010 and reverted back to the ESBWR in 2013.

Over much of the COLA's review of the ESBWR was undergoing an NRC review in parallel until the design was certified in 2014.

We also worked closely with DTE Electric Company who had also selected the ESBWR to implement the design centered review approach called for by the NRC to maximize standardization.

Slide ten, please?

Part 52 has appropriately been described as a process regulation. The safety and environmental requirements that we are required to meet under Part 52 are the same safety and environmental requirements a Part 50 applicant must meet.

There were numerous guidance documents we followed. Two key documents that helped define the safety and environmental requirements were NUREG-0800 and NUREG-1555.

The process guidance for Part 52 is provided primarily through Regulatory Guide 1.206 for COLA content and by Regulatory Issue Summary 2006-06 that describe the one issue, one review, on resolution philosophy that serves as the foundation for the design centered review approach.

Slide 11, please?

Because our goal was to maximize

standardization, owning a few departures and or exemptions were identified when we found it necessary to deviate from DCD content.

The first departure and exemption listed on the table involving seismic analyses had the broadest impact. It was necessary because we used the latest available seismic guidance information and models.

As a result, we exceeded the CSDRS, that is the Certified Seismic Design Response Spectra in the DCD at several frequencies.

That analysis and how we dealt with the exceedances will be discussed in the safety panel.

The other departures and exemptions were caused by a variety of circumstances.

For example, there are two related to the North Anna switchyard. One, because the Unit 3 transformer yard was too small to include all the components described in the DCD for that location.

So, we added an additional switchyard we called the intermediate switchyard.

The other switchyard related departure was identified because the existing North Anna switchyard pre-dates current lighting and surge protection guidance by several decades.

In the departure, we demonstrated equivalent level of protection.

We have one departure and exemption involving RAD waste storage and material control and accounting. They are identical to the ones identified by the referenced COLA, Fermi 3.

We revised the liquid RAD waste discharge piping location allowing it to discharge directly to the environment at the Unit 3 discharge structure, thus, simplifying the design and construction of the cooling water blow down line.

Finally, we identified a departure and exemption for hurricane missile speeds because we used the latest NRC guidance, Regulatory Guide 1.221 issued after the DCD had been submitted.

Slide 12?

The early site permit we received in 2007 proved to be very beneficial. It enabled Dominion to determine potential suitability of the North Anna site.

It provided for the early resolution of siting issues such as water use.

It allowed us to keep options open while we evaluated market conditions and defer a technology decision until justified by the business case.

The early site permit application was based on a plant parameter envelop that included several Gen III+ and Gen IV technologies, both large and small reactors.

To use the early site permit in support of the COLA, we needed to identify differences, variances from ESP content. The variances were driven by the technology decision, by new information and, in a few instances, corrections.

Identifying the variances allowed the NRC staff to be more efficient and review only those aspects of the early site permit or early site permit application content that had changed since the NRC had approved the early site permit in 2007.

With the exception of the seismic variance which resulted in a major revision to FSAR Chapter 2 content, the remaining variances listed on the slide were relatively minor.

They included a 3-inch rise in lake level, conforming the source term to the ESBWR, changes in dose parameters based on new data as a result of changes in receptor locations and dispersion estimates.

Changes in groundwater travel parameters based on new boring data. And, a change in tornado

characteristics based on using the latest NRC guidance.

Slide 13, please?

Most Fukushima Near Term Task Force recommendations were addressed and resolved in the ESBWR design certification.

COL applicants were required to address three Near Term Task Force recommendations.

As you can see on the slide, they were the development of mitigating strategies for beyond design basis external events, training associated with spent fuel pool water level instrumentation power supplies and an assessment of emergency planning, staffing and communications prior to fuel load.

The license conditions we are proposed for North Anna 3 are essentially those for Fermi 3.

Slide 14?

I'll now tee up the safety and environmental panels.

First, safety. This simple graphic is provided to assist you in visualizing the discussion on seismic analyses that the safety panel will present.

As you know, the site specific seismic hazard at the North Anna site exceeded that of the

seismic hazard assumed in the DCD, the CSDRS.

Current analysis methodologies use a probabilistic approach. That approach considered seismic sources within 200 miles of the North Anna site and a number of sources beyond 200 miles.

The energy contribution from those sources, the assumed frequency of occurrence and how the seismic energy propagates through the earth to the site and then up to the structures was analyzed.

Then, an analysis of those structures, certain components and the interactions between major structures was performed.

We concluded that the DCD design was acceptable with only minor changes.

On the next slide, I'll highlight some elements of our seismic analysis.

Slide 15?

Dominion used the latest information and guidance to perform the seismic analyses. We used the new CEUS-SSC model, that is, the Central Eastern United States Seismic Source Characterization model.

We updated the model's catalogue through December 2011 to include the Mineral, Virginia earthquake.

We used the latest EPRI ground motion

model. We used the methodology specified in the DCD to perform the seismic structural analysis.

We followed the latest regulatory guidance.

The safety panel will discuss this and is prepared to answer your questions.

Slide 16?

Now, turning to the environmental panel. Most environmental issues had been identified and were evaluated in the early site permit licensing action.

There were no novel issues identified during the COLA Environmental Review, but we did compare the ESBWR technology to the plant parameter envelop that had been established by the early site permit and took the variances noted previously.

A few topics were deferred to the COLA such as need for power and energy alternatives.

In addition to the deferred items, both Dominion and the NRC monitored and identified new information during the near decade long course of the review to determine whether any new information was significant.

The environmental panel will cover this in their presentation.

Slide 17?

Lastly, the COLA lists a number of environmental permits from federal, state and local agencies that Dominion must have at the appropriate time for the North Anna 3 project to proceed.

Dominion currently holds the permits needed to support COL issuance. They are the 401 permits related to water use and the Coastal Zone Management Act consistency determination.

Finally, required consultations among the various federal agencies have been completed.

A final comment or two, both Dominion and the NRC staff have expended thousands of man hours over nearly a decade to be in the position to present the results of our efforts to you today.

We want to acknowledge the professionalism, hard work and excellent communications we've experienced over that time with the NRC staff that has led us to this moment.

That concludes my presentation and we look forward to answering your questions.

CHAIRMAN SVINICKI: Thank you for those presentations.

We'll begin the question period for this panel with my questions.

I think this question is most

appropriately directed to Mr. Hegner. Your slide 11 talks about maximizing standardization, but it gives a description of departures and exemptions and maybe, to a certain extent, variances on slide 12 as well.

Could you describe at a high level how you strategically balanced the benefits of standardization and the minimization of departures and exemptions versus those ones that you ultimately found necessary to pursue?

Well, we worked, as part of a design centered working group with DTE Energy. And, our focus, like theirs, was to maximize standardization.

We would identify potential opportunities to perhaps improve design, engineers like to do that.

But, our overriding driver was the desire to maintain standardization. We believe there's a strong benefit in being standardized.

CHAIRMAN SVINICKI: So, would it be fair to characterize that the ultimate set of departures and exemptions that you arrived at were those that you felt were necessary? And, there may have been other issues that you found other ways to address without pursing departures and exemptions?

MR. HEGNER: These were departures and exemptions that were necessary for us to take and we

did our best to take no more than was necessary.

CHAIRMAN SVINICKI: Thank you.

I think that's my only question for this panel.

Commissioner Baran?

COMMISSIONER BARAN: Thank you.

Well, thank you for your presentations.

In terms of timing, if you receive a combined license, do you have a sense of when Dominion would make a decision about whether to construct Unit 3?

MR. MITCHELL: We consider multiple factors every year in our integrated resource plans. At the moment, the Clean Power Plan is a bit uncertain, as I mentioned in my testimony.

So, you know, we're continuing to evaluate it and we're just seeing how that plays out with options that can go forward.

You know, I mentioned late 2028 was when the unit could be available for service and that's really based on how long it takes to do it.

You know, we look at a cycle to get there of about -- I'll say about four years to advance engineering a bit more. Then we have to go through a state approval process.

Some equipment lead times which is about a three to four year period.

And, then, we look at about seven years for actual construction and commissioning of the unit.

So, that gets us to that earliest time frame.

COMMISSIONER BARAN: And so, there may be a period there where, if you receive a COL, you'd be a COL holder, but not actively in construction for that -- for maybe even prior to the time you would make a decision about whether you were going to construct the plant and the time frame for that.

For that period, would you expect to remain active with the ESBWR Design Center as the design is further refined?

MR. MITCHELL: I'll answer part of that and defer the other part to Joe.

Yes, I'm mean, there could well be a period where we're just holding the COL and not actively moving forward with engineering or other activities on North Anna.

MR. HEGNER: But, in parallel, we will be now, or at that point, a COL license holder and responsible for all the obligations and requirements that ensure. And, Dominion does have already the

resources, the people with appropriate talent set, processes and procedures and information and databases that would allow us to function as a licensee during that interim period and meet all of our obligations.

COMMISSIONER BARAN: And, would you anticipate during that period that you would be submitting license amendment requests as there were developments on the design or would you expect that you'd wait until there was a decision on construction to proceed with any license amendment requests?

MR. HEGNER: The latter. We do not intend to submit license amendments immediately following the issuance of a license.

COMMISSIONER BARAN: Okay. In several of the responses to the pre-hearing questions, Dominion discussed required commitments in the final safety analysis report, or FSAR.

Can you briefly talk about the process Dominion would use to track FSAR commitments prior, during and after construction?

MR. HEGNER: I'll answer that in two parts. We have -- we use the Dominion nuclear fleet commitment tracking system and specific commitments. That is, a specific action to occur at a specific milestone.

We would employ the CTS just like the rest of the fleet does. And, we're very confident that that system works well. We've used it for a long time.

We view the application, especially the FSAR as one large commitment. Everything we said in there, we have to abide by.

So, our plan was to essentially parse the entire application into the various pieces, parts, down to paragraphs and sentences and distribute that through the entire EPC organization so that each individual who is working to advance the design or develop a program would immediately see the guardrails within which they had to be constrained as they develop that design or develop that program.

And, if there was any need to deviate from what was in the current licensing basis, we would follow all approved regulatory process to make those changes.

COMMISSIONER BARAN: Thank you.

CHAIRMAN SVINICKI: Thank you, Commissioner.

Commissioner Burns?

COMMISSIONER BURNS: Yes, thank you.

And, thank you for the testimony you

provided in the overview.

A couple of things I'd be interested in, particularly when I reflect back on the hearing we had on DTE because, as you both selected the ESBWR technology, I realize there's been a little bit of switching as to who's the reference COL with respect to the --

Are there any implications should you be grated the COL for Unit 3 and begin construction before DTE constructs Fermi Unit 3, and particularly, I think I'm interested, if this situation were to occur, would you -- would North Anna 3, in effect, become the defacto reference COL at that point in time? How do you see that?

MR. HEGNER: I would say yes, we would become the defacto reference COL because I think everyone envisioned the reference COL to be the first.

And, so, I think if we were the first that moved into construction, it would just be natural for us to be viewed that way.

COMMISSIONER BURNS: Okay. And, I presume, but you can tell me, is there a plan to continue sharing going forward with DTE with respect to detailed design information or developments?

For example, if you did get out ahead or,

for example.

MR. HEGNER: Yes, we found great benefit in working with DTE up to this point and would expect to continue that relationship. There is certainly benefits from collaborating in a design center.

COMMISSIONER BURNS: Okay. And, last, and this is really perhaps more of a general reflection and I -- on the Part 52 process. And, I recognize the question involved a little bit of Monday morning quarterbacking.

Obviously, when Part 52 was promulgated over 25 years ago, it's going on almost 30 years ago, the three approaches or the three, and if you will, licensing type approvals in the design certification rules for approval of a technology or a design in general.

And, then, with respect to licensing at a particular site, you had both the option of an early site permit and then the combined license.

In some respects, when I reflect on the approach you've taken, and you're not the only one, that Southern with respect to Vogtle went early site permit and then went to the COL.

I think what strikes me as a little bit different for Dominion is you actually, as you -- as

testimony described, switched out the particular technology, reactor technology to be using.

So, you reflected a little bit, Mr. Hegner, on some of the benefits or what you were able to do to leverage the ESP.

But, I guess, my general question is, and, I recognize this is a little bit speculative, but does the ESP provide you, I think, significant benefits versus just going to a COL?

And, in some ways, my question is almost like, if you had to do it over again, would you do it that way? I know the ESP, in many ways in the early 2000s were really trying to test the process, move through the process.

But, you know, in many ways, it was a conceptual approach to have ESP in the initial Part 52. But, I'd just like any one of you to elaborate more what you might see as benefits or disadvantages of the ESP which might make you do it again if you had the chance or not do it again.

MR. HEGNER: Absolutely, we would do an early site permit application again. There were real benefits by doing that first.

As I mentioned in the slides, going into the early site permit application, we had a paradigm

that the Lake Anna, which we had constructed, as Mr. Giles described, was designed to provide cooling for four units.

COMMISSIONER BURNS: Right.

MR. HEGNER: And, in fact, Units 3 and 4 were under construction and then we changed or made a decision not to proceed.

That vision proceeded over time. And, as we started with the early site permit application, that was our going in view. That was the way the world still was.

But, as we learned fairly quickly, the world had changed views on water, the environment, the community that was now surrounding the lake and living there were different than what we recalled back in the '70s.

And so, it became apparent to us very quickly that we had to look at it differently. And, as you know, we decided to take the new unit off the lake, create a closed cooling water system and, in fact, increased lake level 3 inches as a further mitigation measure.

My point in all that is, we were very glad that we identified that and realized that we were looking at it perhaps through the wrong lense during

the early site permit licensing action.

Had that occurred to us during the COLA, I think it would have had much more of an adverse impact that we would have had to deal with.

But, I am very pleased that we took that opportunity to deal with it during the ESP.

The lesson learned I would suggest I think has already been learned by the industry. The plant parameter envelop that we proposed, it was pretty broad. Almost everything except the kitchen sink.

More recent applicants, TVA, PSE&G, have defined targeted PPEs, a set of small modular reactors or the large light reactors.

And, that was one lesson learned, but were we to do it again, we would better define that set of new plants or potential technologies that we would include within a PPE.

COMMISSIONER BURNS: Thanks, that was very helpful. Thank you.

Thank you, Madam Chairman.

CHAIRMAN SVINICKI: Well, I thank the panel again.

And, I would now ask the NRC staff overview panelists to please take the seats here at the table designated.

As they take their seats, I will remark that, in this panel, the staff will provide an overview of its review of the application, including the use of the design centered review approach for ESBWR combined license applications and a summary of their regulatory findings.

I remind the staff witnesses that they remain under oath and the witnesses can and should assume that the Commission is familiar with their pre-hearing filings.

I'll ask the panel to begin by doing introductions of the panelists.

Thank you.

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

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

MS. BRADFORD: Anna Bradford, Deputy Director of the Division of New Reactor Licensing in the Office of New Reactors.

CHAIRMAN SVINICKI: Thank you and please proceed.

MS. ORDAZ: Thank you.

Good morning, Chairman Svinicki and

Commissioners.

Again, I'm Vonna Ordaz, the Acting Director of the Office of New Reactors.

On behalf of the North Anna 3 review team, we're pleased to address the Commission at this mandatory hearing.

With me, as we've already introduced, Frank Akstulewicz, Director of the Division of New Reactor Licensing and, of course, Anna Bradford, the Deputy Director of the Division of New Reactor Licensing.

The team here today will present the results of the staff's review of the Dominion Virginia Power application for a combined license, or COL, for North Anna 3 proposed for the existing North Anna site in Louisa County, Virginia, approximately 40 miles northwest of Richmond, Virginia.

There are two existing nuclear reactors in operation at the North Anna site, as well as the independent spent fuel storage installation.

North Anna 3 will be located adjacent to and generally west of the North Anna units.

The staff's Supplemental Environmental Impact Statement for the COL, which is referred to as the COL SEIS, was issued in March 2010.

The staff's COL Final Safety Evaluation Report, or FSER, was completed in January of this year.

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

Slide two, please?

On this panel, Mr. Akstulewicz and Ms. Bradford will briefly describe the staff evaluation for the North Anna 3 COLA. This will consist of an overview of the safety and environmental reviews as well as a summary of the staff's regulatory findings.

In November 2007, the staff docketed the initial version of the application. Since then, the staff has expended approximately 105,000 hours on the safety and environmental reviews.

This effort has involved well over 100 engineers, scientists and technical specialists.

During this time, the staff conducted approximately 100 public meetings and conference calls in support of the North Anna 3 COL application review.

The applicant responded to approximately 820 staff questions, of which about 800 were associated with the safety review and about 20 with the COL environmental review.

In addition, the staff considered almost 1,600 comments on the Draft Supplemental Environmental Impact Statement.

Contractors working in collaboration with the staff devoted over 20,000 hours to support the Supplemental Environmental and Safety Reviews.

The review of this application was a very thorough effort and focused on safety and protecting the environment.

Within the NRC, the offices that contributed to the review include the Office of Nuclear Security and Incident Response which looked at the emergency preparedness and security areas.

The Office of Nuclear Reactor Regulation which evaluated financial qualification aspects of the application.

And, the Office of Nuclear Material Safety and Safeguards which supported the reviews for licenses necessary under Part 30 for byproduct material, Part 40 for source material and Part 70 for special nuclear material.

The Office of the General Counsel reviewed the SER and COL SEIS.

Finally, the Advisory Committee on Reactor Safeguards reviewed and reported on the safety aspects of the North Anna 3 application in accordance with the regulatory requirements of 10 CFR 51.87.

In addition, the NRC Region II Office supported environmental meetings in the community near the North Anna 3 site.

Slide three, please?

On November 27th, 2007, representatives of Dominion delivered an application for a COL to construct and operate the single unit North Anna 3 on the current site for North Anna Units 1 and 2.

The North Anna 3 site is located on the shore of Lake Anna.

Dominion would be licensed to construct and operate the North Anna 3 unit if its COL is approved.

Slide four, please?

The North Anna 3 COL application incorporates by reference the Economic Simplified Boiling Water Reactor, or ESBRWR, Design Certification Document, Revision 10.

The ESBWR design was certified by rule

October 15th, 2014 which is contained in 10 CFR Part 51, Appendix E.

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, such as operational programs, site specific design considerations, COL information items, variances from the ESP and exemptions and departures from the ESBWR certified design.

North Anna 3 was reviewed following the design center review approach. The Commission had previously issued a license for an ESBWR for Fermi 3 on May 1st, 2015.

The staff presented its review of the Fermi 3 COL application to the Commission at a mandatory hearing on February 4th, 2015.

We look forward to responding to your questions at this hearing.

I would now like to turn the presentation over to Mr. Frank Akstulewicz.

MR. AKSTULEWICZ: Thank you, Vonna.

Good morning, Chairman and Commissioners.

Today I will discuss the scope of the staff's safety review and the findings of the Advisory Committee on Reactor Safeguard, or ACRS.

Slide five, please?

In accordance with 10 CFR 52.87, the ACRS examined the staff's safety review of the North Anna 3 combined license application.

The staff presented its North Anna 3 combined license safety evaluation to the ACRS Subcommittee in October of 2016 and presented again to the ACRS Full Committee in November of 2016.

The ACRS issued a report on November 15, 2016 concluding that there is reasonable assurance that North Anna 3 can be built and operated without undue risk to public health and safety.

This ACRS report recommended approval of the North Anna 3 combined license without condition. There were no North Anna 3 application specific recommendations for which the Committee sought specific staff action or response.

The staff issued its Final Safety Evaluation on January 12th, 2017.

Slide six, please?

The staff prepared SECY17-0009 dated January 18th, 2017 to support this mandatory hearing.

In that 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 and provided an overview of the findings that support the issuance of a combined license for North Anna 3.

In order to issue a combined license, the Commission must be able to conclude that each of the following findings in 10 CFR 52.97 is met.

I will summarize the staff's basis supporting each finding.

First, the applicable standards and requirements of the Atomic Energy Act and the Commission's regulations have been met.

The staff reviewed and evaluated the application against the applicable criteria in 10 CFR Part 51 entitled Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions and 10 CFR Part 52 entitled Licenses Certifications and Approvals for Nuclear Power Plants.

Based on the staff's review, as documented in its Final Safety Evaluation Report and the combined license Supplemental Environmental Impact Statement, the staff concludes that the applicable standards and

requirements of the Atomic Energy Act of 1954 as Amended and the Commission's regulations have been met.

Second, any required notifications to other agencies or bodies have been duly made.

As documented in the SECY paper, all required notifications such as to the Virginia State Corporation Commission as well as the required Federal Register Notifications have been made.

Slide seven, please?

Third, there is reasonable assurance that the facility will be constructed and operated in conformity with the license the provisions of the Atomic Energy Act and the Commission's regulations.

As the SECY paper states, the staff believes that its review as documented in its final safety evaluation report and the combined license Supplemental Environmental Impact Statement, the inspections tests, analyses and acceptance criteria, or ITAAC, and the license conditions provide the necessary assurance that the unit will be constructed and operated as required.

Fourth, the applicant is technically and financially qualified to engage in the activities authorized. The technical and financial

qualifications of the applicant are summarized in the SECY paper and documented in detail in Chapters 1, 13 and 17 of the staff's Final Safety Evaluation Report.

Slide eight, please?

Fifth, the issuance of the COLs will not be inimical to the common defense and security or the public health and safety. The specific bases of our inimicality finding have been provided in the staff's SECY paper.

And, sixth, the findings required by Subpart A of 10 CFR Part 51 have been duly made.

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

MS. BRADFORD: Thank you and good morning, Chairman Svinicki and Commissioners.

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 the combined license can be granted.

Slide nine, please?

The staff conducted its environmental review for the North Anna Unit 3 COL application in accordance with the National Environmental Policy Act of 1969 and the requirements of 10 CFR Part 51.

The staff conducted its review based on its independent assessment of the information provided by the applicant and information developed independently by the staff, including information gathered through consultations of other agencies.

There were no cooperating agencies participating with the staff in the North Anna COL Environmental Review.

The fact that the North Anna COL application references an early site permit, or ESP, essential to understanding the staff's environmental review for the North Anna COL as documented in NUREG-1917, the Supplemental Environmental Impact Statement for the combined license for the North Anna Power Station Unit 3.

The NRC regulations require that for a COL referencing an ESP, the staff is to prepare a supplement to the Environmental Impact Statement that was prepared for the ESP.

Slide ten, please?

Because an ESP requires and Environmental Impact Statement that considers the impacts of both construction and operation of a reactor or reactors at a selected site, the regulations enable the COL review to take advantage of the substantial resolution of issues that occurs at the ESP stage.

Accordingly, the regulations in 51.92 direct the staff to address only issues that were not resolved during the ESP review and to other focus on whether there is new and significant information with respect to the issues that were previously resolved.

The NRC began the environmental review process for the North Anna COL application by publishing a Notice of Intent to prepare a supplemental EIS in the Federal Register on March 13th, 2008.

A scoping meeting was held on April 16th, 2008 in Mineral, Virginia to allow individuals to participate in the scoping process by providing oral comments.

The staff contacted federal, state, regional and local agencies and federally recognized Indian Tribes during the scoping period to solicit comments.

The staff reviewed these and other public

comments received during the scoping process and responses were developed for each comment.

These responses were documented in a Scoping Summary Report and are also provided in Appendix D of the COL SEIS. All of these comments were considered during the environmental review of the COL application.

Specifically, the staff consulted with the U.S. Fish and Wildlife Service, National Marine Fishery Service, federally recognized Indian Tribes, the Virginia Department of Historic Resources and other agencies as required by the Endangered Species Act, National Historic Preservation Act and other statutes.

Slide 11, please?

The draft COL SEIS was issued in December 2008. A 75-day comment period for the draft COL SEIS began on January 2nd, 2009, the date of publication of the U.S. Environmental Protection Agency's Notice of Availability.

The staff held a public meeting on February 3rd, 2009 in Mineral, Virginia to describe the preliminary results of the staff's environmental review and to respond to questions and accept public comments.

The staff developed responses to the comments received on the draft COL SEIS and provided these responses in Appendix E of the final COL SEIS.

In March 2010, the staff issues the final SEIS as NUREG-1917. As stated in the COL SEIS, 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 the North Anna COL application environmental report, the staff's review conducted for the ESP application and documented in the ESP EIS, consultation with federal, state, Tribal and local agencies, the staff's own independent review of those issues that were deferred to the COL and of the new and potentially significant information available since publication of the ESP EIS, the staff's consideration of comments that were received during the review process and the assessments summarized in the COL SEIS, including the potential mitigation measures identified in the environmental report and in the COL SEIS.

Slide 12, please?

At the time the COL SEIS was completed, the staff's safety review of the application was still in progress.

10 CFR 51.92 requires the NRC staff to prepare a supplement to a final EIS if there are substantial changes in the proposed action that are relevant to environmental concerns or if there are new and significant circumstances or information relevant to environmental concerns that bear on the proposed action or its impacts.

Accordingly, after completion of the COL SEIS, the staff followed its process for consideration of any new information to determine whether a supplement to the COL SEIS might be necessary.

Based on its consideration of new information since the COL SEIS was published, the staff found that a supplement was not warranted.

Slide 13, please?

The staff included a Draft Summary Record of Decision as a reference in the SECY paper sent to the Commission on January 18th, 2017. This document states the decision being made and identifies all alternatives considered in reaching the decision.

The preferences among the alternatives are also discussed.

Slide 14, please?

The Draft Summary Record of Decision also states that the Commission has taken all practicable

measures within its jurisdiction to avoid or minimize environmental harm from the alternative selected.

Slide 15?

This slide lists the environmental findings pursuant to 10 CFR 51.107a, that the Commission must make to support the issuance of the North Anna Unit 3 COL.

The staff believes that the scope of the environmental review, the methods used to conduct the review and the conclusion reached in the COL SEIS are sufficient to support a positive determination regarding these findings.

For the first finding, in accordance with NEPA Section 102.2a, the staff's environmental review used a systematic interdisciplinary approach to integrate information from many fields including the natural and social sciences as well as the environmental sciences.

The staff's review also comports with the NRC's requirements in Subpart A of 10 CFR Part 51. The staff concludes that the environmental findings in the COL SEIS constitute the hard look required by NEPA and have reasonable support in logic and fact.

In accordance with NEPA Section 102.2c, the COL SEIS for the North Anna COL addresses the

environmental impact of the proposed action, any unavoidable adverse environmental effects, alternatives to the proposed action, the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity and any irreversible and irretrievable commitments of resources that would be involved in the proposed action, should it be implemented.

As supported by correspondence presented in Appendix F to the COL SEIS, and additional documentation developed since then, the staff concludes that the requirements of NEPA Section 102.2c were fulfilled by consulting with and obtaining comments from other federal agencies with jurisdiction by law or special expertise.

In accordance with NEPA Section 102.2e, the staff concludes that the COL SEIS demonstrates that the staff adequately considered alternatives to the proposed action.

The alternatives considered include the no action alternative, energy alternatives, system design alternatives and mitigation alternatives for severe accidents.

Slide 16?

For the second and third findings which

appear on this slide and the next, Chapter 10 of the COL SEIS provides the staff's cost benefit assessment which considered conflicting factors such as the need for power as well as reasonable alternatives to the proposed action.

Slide 17?

Based on that analysis, the staff concluded that the construction and operation of the proposed North Anna Unit 3 would have accrued benefits that would be expected to outweigh the economic, environmental and social costs.

As a result, the staff recommends that the COL be issued.

Slide 18, 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 a COL.

I will now turn the presentation back to Vonna Ordaz.

MS. ORDAZ: Thank you, Anna.

During this hearing, the staff will be presenting information on the issues listed on this slide, slide 19.

The safety and environmental panels will discuss unique facility features and novel issues that arose as part of the review process.

Specifically, the safety panel will cover two topics, the first is the Mineral, Virginia earthquake. And, second is the seismic exceedance of the certified design.

The environmental panel will discuss the environmental review process for the North Anna 3 COL.

This concludes the staff's opening remarks. We are prepared to respond to any questions you may have.

Thank you.

CHAIRMAN SVINICKI: Thank you for those presentations.

We will begin the questioning of this panel with Commissioner Baran.

COMMISSIONER BARAN: Thank you.

Well, thank you, again, for your presentations and for all of the hard work that went into the reviews so far.

The staff published the Supplemental

Environmental Impact Statement for the combined license seven years ago in March 2010.

Anna, you briefly touched on this in your presentation, but can you discuss in a little bit more detail how the staff identified and analyzed any new and potentially significant information from the past seven years that could have triggered the need to further supplement the EIS?

MS. BRADFORD: Sure. We do have guidance within the Office of NRO about what needs to be looked at and how it should be documented after any EIS has been finalized to determine whether it needs to be supplemented. And, we followed that guidance very carefully.

Since the final EIS was published in 2010, we've remained aware of changes in the environment or changes in the project. We've talked to the applicant during that time. We've done other NEPA type searches.

There's resources available on the web where you can look to see if there's maybe other projects going up nearby.

And, we've documented all that and done an analysis where needed to to see if we needed to supplement. And, we're confident that the conclusions

reached in 2010 are still applicable.

COMMISSIONER BARAN: This is the last COL application the staff currently has for an ESBWR and, presumably, the staff would have worked on the design review and the two COLs referencing it are moving on to other tasks.

Can you talk a little bit briefly, Vonna or Frank or Anna, about how you're capturing and documenting the knowledge of these individuals so that the staff is prepared to review any future ESBWR related licensing matters?

MS. ORDAZ: Absolutely. Frank?

MR. AKSTULEWICZ: So, one of the things that we're going to be doing now as the staff frees up to do them is to actually record as part of our regulatory fabric the lessons learned.

And, we've done this traditionally, now this will be the fourth or fifth time we've issued lessons learned reports. So, moving forward, we're going to capture that, I think.

We'll also be involved with building office instructions and internal guidance memorandum that captures -- we have a document that we refer to as the end-game notebook that kind of builds on the history of what we do every time we get near the end

of a license or as we're getting ready to issue. So, we'll be moving forward.

Whether or not that guidance will be specific to an ESBWR, I'm not certain. But, we'll try to make sure that the lessons learned during the review process are captured.

COMMISSIONER BARAN: Thank you.

CHAIRMAN SVINICKI: Commissioner Burns?

COMMISSIONER BURNS: Well, thank you.

I'm going to ask a question similar to my one I did for the applicant with respect to the conceptual design of Part 52, if you will.

This is the second time we've looked at an application for a combined license that also referenced an earlier ESP.

As they say, I think looking at the Vogtle experience, my recollection is we've basically at the ESP at the same time we're looking at the COL.

And, as the applicant's answer to my question seemed to indicate they viewed some benefits from the ESP process that they then could use or leverage in the COL.

So, my question I think to the staff is, from your perspective, did the process work with respect to the conceptual framework for ESPs and COLs

within Part 52? Did that conceptual framework work well with respect to this application? Were there any unexpected challenges or lessons learned that -- or lessons learned that you would have from this experience?

MR. AKSTULEWICZ: That's a great question.

I think, as an initial starting point, I think you would have to look at the benefit of the ESP in the context of the RAIs that we had to ask in the environmental review.

If you recall in the testimony, there was -- we said there were only like 20 RAIs that were issued on the whole environmental review from the ESP was actually issued.

Because, the benefit really to an ESP is the degree to which you close on matters. So the broader the ESP coverage, the greater the benefit.

And, so, I think we've seen the benefit exercised to great effect, both with Vogtle and with North Anna simply because they chose to take on the tougher issues to the extent that they could resolve the emergency preparedness or others.

So, those issues were removed from the additional review that had to be done when the COL actually came in.

So, in effect, I think we've seen the great use of the ESP concept under Part 52 for both of these applications.

COMMISSIONER BURNS: And, I guess, or any of you -- okay, related to that, what kind of discipline does, in effect, do you have to do in terms of, I think the temptation is going to be, it says we can look at -- we've got this thing in front of us. It ultimately we're going to, you know, the question is whether we're going to license or provide the full COL.

What kind of discipline is there in terms of making the kind of division, Frank, you talked about in terms of things that have been resolved versus this area?

And, sometimes, there are going to be gray areas about other questions or issues that need to be looked at in terms of the COL.

So, explain to me in terms of the process of the discipline that within the staff for looking at finality from the standpoint of what the ESP, yes, the early site permit did versus what you need to go on and do, either from a safety or an environmental standpoint?

MR. AKSTULEWICZ: Sure. The clarity with

which the safety evaluation and the environmental documents are prepared provide that framework or structure that you're referring to, Commissioner.

So, I think in both of the cases for both Vogtle and for North Anna, the clarity of the safety evaluations established clear boundaries around the issues in terms of the scope of what was considered at that time and what was evaluated.

And then, graced with a cover of finality, if you will, for those matters.

So, it wasn't difficult for the staff to have a clear understanding of those issues that were included and those issues that were not.

And so, in, you know, in the hindsight, effort that we were talking about with Commissioner Baran about, going back and looking at our guidance to make sure that when we discuss how we write our safety evaluation, our environmental findings to make clear there are certain areas that are still unresolved or areas that are evaluated and have the finality associated with them, that would be one of the things we would want to make sure is clear in terms of going on to the next step in whatever applications we receive in the future.

COMMISSIONER BURNS: Okay, thank you.

Thank you, Madam Chair.

CHAIRMAN SVINICKI: Well, thank you for that presentation.

My questions will also, I think, be at a kind of a high level, but this is an overview panel, so I think that that's appropriate.

Vonna, you gave some statistics, I was taking some quick notes here about the staff's review effort. I think you said 105,000 staff hours. I believe there was a discussions of contractor hours that I think is separate and not imbedded in that total of about 20,000 hours, over 100 public meetings and conference calls and 820 staff questions, again, 20 of which, as Frank was just mentioning, were in the environmental side, the predominance of those was in the safety side.

There was a change in the designated technology over the course of the entire review, though. The totals seem a little bit higher than numbers I've heard in other proceedings.

So, is it correct to assume that some portion of the staff's effort was related to looking at a technology and then having the technology changes, is that why the hours might be a little higher?

MR. ORDAZ: Yes, that's correct. Essentially, the technology changed twice from the ESBWR to the US-APWR and then back to the ESBWR.

So, with the technology changes as well as the timing that we had to factor in the post-Fukushima event as well as the Mineral, Virginia earthquake.

So, adding up all of that, that did add to the total staff hours than previous proceedings that you've heard.

CHAIRMAN SVINICKI: Okay, thank you. I thought it was just important maybe to add that context because, otherwise, it may look like there were specific uniqueness and challenges on the safety side of this review.

But, since there were changes, I think, as you're indicating, some of the effort is attributable to the changes that were made over time, which I'm not making a judgment on one way or another, but they do result in some additional process.

As I reflect on the period of time, though, that those hours represent, we've made some reference to the fact that it's been nearly ten years in terms of receipt of the initial applicant interest in getting to today.

Over the course of that time, I've been in

my same job. But, as I look at the staff witnesses and even people here at the table, Anna, I know has held a number of positions in that time, Vonna same for you. Frank has some pretty good continuity on the issues.

But, how does the staff weight providing continuity to our review? I know we are phasing in and out different types of expertise over time. The safety review takes a certain course, the environmental review takes a certain course.

Do we find that we have a number of different experts over the course of time? Or are we able to devote people at least when a segment of the review process is going on, keep the continuity until they can document and complete their work and document it, feed that into the overall review process?

How do we weight the value of some continuity in staff assignments over something that takes nearly ten years? Which might be, you know, a third of somebody's entire career at NRC. I don't know who might want to talk about that. It's a real management question, it's not really a technical question.

Frank, do you want to --

MS. ORDAZ: Go ahead, you've been here

since the beginning.

(LAUGHTER)

MR. AKSTULEWICZ: Ouch. So --

COMMISSIONER BURNS: I know how he feels.

(LAUGHTER)

MR. AKSTULEWICZ: So, I think, you know, that's a great perspective. I know that the staff makes every effort to assure the continuity of the review over the course of the review period.

And, as you might understand, people's careers move on, right, people get promoted. And, there is not much you can do to limit that movement.

But, while they are here, there's a great effort to make sure that the assignments stay continuous through the project as much as they can from start to finish so that you don't lose that perspective, you don't miss out on the, you know, or you forget the questions that were asked or the reasons the decisions were made.

And, that is a real challenge when we get to the end part where we're getting ready to go to the hearing and trying to recapture the history of the review where you've had two or three or four maybe reviewers over the course of that period simply because of the continuity changes from staff movement.

So, we do, again, to emphasize it, we do place high importance on continuity of the reviewers over the course of the review. We don't arbitrarily change them in and out.

CHAIRMAN SVINICKI: Do we try, where possible, to provide a little bit of a hand off or overlap so that an expert coming into the process if someone is moving on, they might be able to, I won't call it double encumber, although that's the official term, but we can have some continuity in terms of maybe the overlap by a few weeks?

MR. AKSTULEWICZ: Yes. So, again, it depends on the circumstances. Sometimes, the departure is rather sudden and so you don't have that luxury of transition where people, you know, leave the Agency.

Where people are still within the Agency, we take advantage of that opportunity in terms of the transition where, you know, we can go to that individual, be they in NRR or NMSS and say, we don't understand what you were doing or why were you asking this or, you know, what was the conclusion you were trying to get? What was your concern as part of that transition of knowledge?

So, to the extent that it is possible, we

do do that to try to capture the knowledge of the previous reviewer, but it's not always perfect.

MR. ORDAZ: And, I would offer that, as we had a discussion earlier this morning with all the witnesses, I asked the question, how many of you have not been to a hearing before and served as a witness?

Not many hands went up, so I was very impressed to see the number of returns as witnesses through the proceedings. That was quite impressive.

As Frank mentioned, we're also focused on knowledge management. It's a huge area, especially with the budget and the future decrease and current decrease as we have.

Turn over, clear communications, seamless transition and a lot of this does fall to the first line supervisor which is the branch chief, of course. And, they play a pivotal role and have been doing a marvelous job ensuring that we have seamless transition.

CHAIRMAN SVINICKI: Well, thank you. And, again, you responded to, I think it was Commissioner Baran's question about, if there is some period of dormancy between the issuance of this license and the need for NRC to invigorate construction inspection and oversight at some years later, it will be important,

the knowledge management, maybe the oral history interviews, other things that we do as part of our knowledge management program.

Of course, the staff is very expert in documenting and we have many reactors in this country that have operated more than 40 years and we know how to go back and have continuity to the early safety determinations and licensing decisions.

I think what is a uniqueness here is that there might be a period of some dormancy and we would need to kind of re-energize that knowledge base. So, I appreciate the staff's focus on that.

Dominion began in their overview presentation by complimenting the staff's professionalism, so I appreciate that.

Would you like to say or make any commentary about the applicant?

(LAUGHTER)

MS. ORDAZ: Well, absolutely.

CHAIRMAN SVINICKI: Knowing that we've set a very constructive tone already this morning.

MS. ORDAZ: We return the acknowledgment of the professionalism. And, there's been wonderful interactions, extended outreach to us also for the site visit. They've been very generous with returning

calls to us, RAI responses through the years.

So, it's been a very collegial, professional interaction with Dominion. So, we thank them.

CHAIRMAN SVINICKI: And, on a serious note, I did note that part of their commentary was about strong communications and it's a personal view of mine that, no one is guaranteed an approval of something if you submit something for review.

But, I do think that transparency in the process, communication, understandings of, you know, this issue is complex, we're going to need some more engagement with you. I think that that is something that applicants and the NRC can commit to each other is just to keep the communication open.

And, I appreciate that the applicant made an acknowledgment that NRC puts a tremendous effort on the openness and transparency of our review processes.

So, I want to compliment staff on that because it's hard to do when you're busy, say, oh, I think I should probably notify this applicant of something or other.

But, I think we place a strong value on communicating where we are and the status of things. So, I want to compliment you for that.

We will now take a brief break as we reset the panels.

We like to hold these to five to seven minutes, so I'm going to ask perhaps at 10:30 that individuals would be back in the room.

Thank you.

(Whereupon, the above-entitled matter went off the record at 10:25 a.m. before coming back on.)

CHAIRMAN SVINICKI: All right, thank you everyone, if we could resume now. We changed the format a little bit in that the panels are combined now and the staff will sit in chairs off a little bit to the side, and we'll take the microphones after the Applicant has presented.

So this is the Safety Panel. The parties will address relevant sections of the application and two chapters in particular from the final safety evaluation report, Chapter 2 regarding Site Characteristics, Chapter 3 regarding the Design of Structures, Components, Equipment and Systems and Chapter 4 regarding the Reactor Mechanical Components of the North Anna ESBWR.

I remind the witnesses that they remain under oath and advise the witnesses that they can and should assume the Commission is familiar with their

prehearing filings. I'm going to begin by asking the panelists to please introduce themselves, starting with Dominion.

MS. BORSH: Good morning, Commissioners. I'm Gina Borsh from Dominion. I'm the Licensing lead for the safety side.

MR. WADDILL: I'm John Waddill from Dominion, consulting engineer for the engineering side.

MR. MARRONE: I'm James Marrone, seismologist with Bechtel Corporation.

MR. TODOROVSKI: Luben Todorovski, serial structural engineer from GE Hitachi Nuclear Energy.

CHAIRMAN SVINICKI: Thank you, and I'll have the staff introduce themselves when they take their microphones. But would Dominion please proceed.

MR. WADDILL: Thank you, good morning. The Safety Panel will present the development of the seismic hazards analysis following the 2011 Mineral, Virginia earthquake, and evaluation of structures, systems, components and fuel in light of the exceedances of these standard plan Certified Seismic Design Response Spectra, or CSDRS.

Slide 2, please. The Mineral, Virginia earthquake occurred on August 23rd, 2011. This was a

magnitude 5.8 event with an epicenter located about 18 kilometers or more than 11 miles southwest of North Anna, and a shallow depth estimated at 7.5 kilometers or 4.7 miles.

This slide shows the location of the North Anna site with a 25 mile site vicinity, indicated by the red circle, as submitted locations for the source of the estimate, whether USGS, the Virginia Tech Seismic Observatory or a study by McNamara, et al. published in 2014.

Slide 3, please. Dominion reevaluated the seismic hazard for the site and developed new spectra based on the most current guidance and methodologies. The reevaluation followed Reg Guide 1.208 methodology and used the newly-released Central and Eastern U.S. seismic source characterization model, after updating the seismic source catalogue to include the Mineral earthquake and other events greater than magnitude 2.9 occurring through mid-December 2011.

Additionally, the updated EPRI 2013 ground motion model was used in developing the revised probabilistic seismic hazard analysis. New site-specific response spectra, ground motion response spectra and foundation input response spectra were produced from the PHA results, using the guidance of

ISG-017.

Slide 4, please. This slide shows the resulting horizontal and vertical site-specific response spectra for the reactor building and the fuel building and the control building. The black line is the CSDRS. The red lines are for the reactor building/fuel building. The blue lines are for the control building.

You can see that the site-specific response exceeds the CSDRS at certain frequencies, mostly in the mid- and higher range, though some fall below 10 hertz.

Slide 5, please. Because of the exceedances of the standard plant CSDRS, Dominion re-performed the seismic analyses to show that the standard design is adequate for use at Unit 3. Soil structure interaction analyses and structure soil structure interaction analyses were performed for the seismic Category 1 structures.

The resulting seismic demands were then developed and compared to the standard design. Site-specific evaluations were performed to address exceedances in the DCD seismic load demands previously evaluated for the standard plant, in order to demonstrate the adequacy of the design of the

structures and components for the site-specific conditions.

These site-specific evaluations were performed following the approved ESBWR DCD methodology.

Slide 6, please. The results of the seismic evaluations show that the design to the DCD seismic Category 1 structures are adequate for use at Unit 3. Some minor changes to the standard design of structures were required to withstand the site-specific seismic load demands. No changes to member sizes were necessary such as wall or slab thicknesses, beam or column sizes.

The changes included modification of the arrangement of some steel reinforcements and shear ties, the size of the steel girder in the control building and shear keys for the foundation of the fire water service complex. As stated on the previous slide, the site-specific seismic loading was applied to the components that were evaluated in the DCD.

The DCD methodology was used to evaluate components such as the PCCS condenser, fuel racks, fuel and control rods. Minor adjustments were required to some components including increasing size of anchor bolts for the new fuel racks and the buffer

pool, and increasing the weld size for the enveloping plate, the base plates and the anchor bolt size for the spent fuel racks in the buffer pool deep pit.

Additionally, the loads applied to the saddle support bolts for the PCCS condenser are increased to meet the seismic demands for Unit 3. In summary, the evaluation of the standard plant design for the increased seismic loading resulting from the exceedance of the standard plant CSDRS has demonstrated that the certified design is acceptable for Unit 3. This completes Dominion's Safety Panel. Thank you.

CHAIRMAN SVINICKI: Thank you. Would the NRC staff witnesses please move in and sit before your microphones? Would you begin by each introducing yourselves and then proceed with the staff safety presentation? Thank you.

MR. SHEA: My name is Jim Shea. I'm the lead project manager for the review of the North Anna 3 reactor.

MR. GRAIZER: Vladimir Graizer. I am a seismologist on the review of this application.

MR. CHAKRAVORTY: Manas Chakravorty. I am a senior structural engineer in the Engineering Division of Structural Engineering and Infrastructure,

and I have been the lead reviewer for -- lead structural reviewer for this application.

MR. THOMAS: I'm Matt Thomas. I'm a reactor systems engineer in the Reactor Systems Branch in the Office of New Reactors.

CHAIRMAN SVINICKI: Okay, thank you. Please proceed.

MR. SHEA: Good morning Chairman Svinicki and Commissioners. My name is James Shea and I am the lead project manager for the staff review of the North Anna 3 combined license application or COLA. Slide 2. Joining me on this panel, as we just introduced ourselves is Mr. Vlad Graizer, Manas Chakravorty and Matt Thomas. We have additional staff available in the audience for responding to questions as necessary.

Slide 3, please. The staff's presentation for this panel will discuss two unique site-specific topics of the safety review. First, the Mineral, Virginia earthquake and second, the site-specific exceedances of the ESBWR Certified Seismic Design Response Spectra or CSDRS, including analysis of the seismic structures, systems and components.

Next slide. Following the North Anna 3 technology change from Mitsubishi USAPWR technology back to the ESBWR in April 2013, the staff had

questions related to the site-specific seismic review. These questions were prompted by the following significant issues: The March 11th, 2011 Fukushima event which prompted seismic hazards reevaluations for the industry and for combined license applicants; the August 23rd, 2011 Mineral, Virginia earthquake; the updated Central Eastern United States Seismic Source Characterization Model or CEUS SSC, which was released in 2012 and can be found in NUREG-2115, and the EPRI ground motion model or GMM which was updated in 2013.

Given these staff questions and following meetings with the staff on several occasions in 2014, the applicant submitted its seismic closure plan on October 22nd, 2014.

Next slide. This slide shows the relationship of the various seismic parameters that were reviewed by the staff for the North Anna 3 site. The seismic closure plan included establishing a Uniform Hazards Response Spectra or UHRS, which is shown in the figure at the base rock level for the site using the EPRI 2013 ground motion model.

Next, the Ground Motion Response Spectra or GMRS was developed for the site. Then the individual Foundation Input Response Spectra or FIRS were developed using the same UHRS input for each

seismic structure. I would emphasize for context later in our presentation that the GMRS is the site hazard spectra, and that the structure FIRS are specific to each seismic structure on the site.

The site-specific FIRS are compared to the Certified Seismic Design Response Spectra, which is the ESBWR seismic input spectra established for the standard design to envelope the site seismic hazard for most nuclear sites. In the case of North Anna 3 site, it was determined that the site-specific seismic structural FIRS exceeded the CSDRS at some frequencies, which required further analyses.

Following the analyses, the In-Structure Response Spectra or ISRS are developed for the in-structure systems and components. The in-structure systems and components are subject to confirmation by ITAAC during construction. I will now turn over our presentation to Vlad Graizer, who will address the topics of the Mineral, Virginia earthquake and the site-specific GMRS.

MR. GRAIZER: Thank you, Jim. I am Vladimir Graizer, geophysicist in the Office of New Reactors. I will discuss the variance in the GMRS between early site permit or ESP and combined license application or COLA.

Slide 7, please. After the ESP was issued in 2007, the Mineral, Virginia earthquake occurred in August 2011, approximately 11 miles away from the North Anna 3 site. The earthquake is located in the Central Virginia Seismic Zone, CVSG. This zone is well known for its moderate seismicity. The largest known earthquakes in this zone were magnitude 4.8 in 1875 and a magnitude 4.5 on December 9, 2003.

Both earthquakes occurred in Goochland County, Virginia. As a result, both the Mineral earthquake, the design basis earthquakes for the Units 1 and 2 were exceeded, and the plants were shut down and inspected. There were no significant damage to any Category 1 systems, structures and components.

Following the Mineral earthquake, the Fukushima event and the publication of the new seismic models that my colleague mentioned, staff requested a reassessment of the Probabilistic Seismic Hazard Analysis or PSHA for the site.

Slide 8, please. The left panel on this slide demonstrates the location of the Mineral earthquake relative to the North Anna 3 site. The Mineral, Virginia earthquake was one of the largest earthquakes that occurred in the Central and Eastern United States in recent history.

It had more than magnitude 5.8 and was widely felt over a broad area inhabited by approximately one-third of the U.S. population. The epicenter of the Mineral earthquake was approximately 11 miles southwest of North Anna 3 site, at the focal depths of about five miles.

The epicenter's location is shown by the green and pink dots on the map, and the site is shown with this dot. The right panel on this slide describe the features of the Mineral earthquake. This earthquake had a reverse hold mechanism with no measurable surface rupture. Seismologists call it blind reverse fault. In a reverse fault, one block is pushed up relatively to other side. Blind fault means that the fault rupture didn't reach the surface.

Slide 9, please. The North Anna COLA took a variance from the spectra observation values in the ESP for several reasons. First, the final elevation of reactor and fuel building foundations in the COLA were different than assumed in the ESP, and second, the applicant used updated methodology and data consistent with current NRC guidance.

As my colleague has described, the applicant provided the seismic hazard analysis following NRC staff request, to incorporate the new

seismic source characterization for CEUS SSC, which was published in NUREG-2115 in 2012; the new EPRI ground motion model describing continuation of seismic motions with distance from seismic source, which was published in 2013; and the Mineral, Virginia earthquake.

Slide 10, please. Staff performed its own detailed independent confirmatory analysis. This analysis included rock hazard, site response and GMRS calculations. Staff confirmed Dominion's calculations. The site-specific GMRS conservatively enveloped the North Anna 3 site variations in their response spectra.

Slide 11, please. This slide demonstrates the GMRS for ESP and COLA in blue and black lines, respectively. Relative to the ESBWR certified seismic design response spectrums, CSDRS shown the red line. The newly-calculated GMRS is less than the ESP at most frequencies. This is due to elevation, control point differences and application of new models and data in the PSHA.

As was mentioned before, the change in the control point reflects the actual elevation of the reactor's foundation, rather than the elevation assumed for it in ESP.

Slide 12, please. This slide shows comparison of the CSDRS, again the red line, with the actual North Anna Unit 1 recordings. The regular lines on the slide represent recorded ground motions along the two horizontal and one vertical component of the Mineral earthquake motion inside the Unit 1 containment.

It shows that the Mineral earthquake data are significantly below the CSDRS for ESBWR. The applicant's final seismic characterization satisfies the requirement of Appendix A -- thank you. The applicant's final seismic characterization satisfies requirements of Appendix A to Part 50, General Design Criterion 2, GDC-2, that states in part the design basis for the structures, systems and components shall reflect first, appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area.

Slide 3, please. In conclusion, the site-specific GMRS adequately represents the seismic hazard at the North Anna 3 site, and meets the relevant regulatory requirements provided in 10 C.F.R. Part 52 and 10 C.F.R. Part 100. This concludes my presentation. Thank you for your attention, and I

will now turn over our presentation to Mr. Manas Chakravorty.

MR. CHAKRAVORTY: Thank you Vlad and good morning. I am Manas Chakravorty, and I'm a serial structural engineer in the Office of New Reactors. I am one of the reviewers of Section 3.7 and 3.8 of North Anna 3 FSAR. These sections provide information on seismic design of Category 1 structures. I will discuss how the applicant has addressed the exceedance of ESBWR seismic design basis at North Anna 3.

Slide 15, please. According to 10 C.F.R. Part 52, a combined license application referencing a design certification should demonstrate that the site characteristics fall within the site parameters specified in the design certification. At North Anna 3, the site-specific values do not fall within the values established by the DCD site parameters CSDRS.

Because of this exceedance, the applicant has taken a departure, Departure 3.7.1 from the ESBWR certified design. The departure involves change to ESBWR TI-1 information, which defines the safe shutdown earthquake, or SSC in accordance with Appendix S to 10 C.F.R. Part 50.

Therefore, the applicant also requested an exemption, Exemption 3 from the DCD Tier 1 evaluation.

Staff evaluation of the departure and exemption is presented in FSAR Chapter 3.

Slide 16, please. This figure shows an example of the seismic exceedances of the site-specific horizontal foundation input response spectra or FIRS when compared to the ESBWR CSDRS. Here, the red line shows the CSDRS and the blue lines shows the control building first.

As seen in this figure, the exceedance started about six hours and above, and is considered important for seismic analysis, those frequencies. The applicant also revised the definition for the SSC, now to include the both CSDRS and the site-specific FIRS for each seismically qualified structure.

Slide 17, please. Because of exceedance, the applicant needed to perform site-specific seismic analysis to establish the seismic demand and site-specific evaluations for Category 1 structures, using the site-specific seismic demand along with other non-seismic standard design loads. The seismic demand consists of both the seismic load, which is discussed below, and the structure response spectra or ISRS.

The site-specific seismic loads are used for evaluation of these structures. The site-specific ISRS that exceeds the standard design ISRS is used in

addition to the standard design ISRS for seismic design and qualification of systems, equipment and components.

Slide 18, please. The applicant performed site-specific soil structure interaction analysis to establish the seismic demand. The analysis considers the effective interaction between the soil and structures. The analysis forward, the DCD methodology and used first and site characteristics as input. The SSI analysis indicate that both site-specific seismic load demand and the ISRS exceed the corresponding DCD seismic demand. Therefore, further the design assessment of the SSCs is required.

Slide 19, please. The applicant used the seismic loads obtained from the site-specific SSI analysis, along with the non-seismic standard design loads to determine the structural adequacy of the SSCs. The evaluation saw that some changes to the standard design is needed.

Specifically, as discussed in the departure justification presenting in the Part 7 of the COLA, the applicant identified the specific changes necessary to ensure that SSCs are seismically adequate to meet the site-specific seismic demand. Identified changes to the certified design include the

arrangements of steel reinforcement and shear ties, the size of the steel girder, weld sizes and anchor bolt sizes. No changes to the thickness of the concrete walls and slabs were necessary.

Slide 20, please. Staff reviewed the information provided in the COLA and verified by audit and confirmatory analysis that the site-specific FIRS and soil characteristics were used for establishing the seismic demand for structure evaluation. The analysis is based on the DCD methodology and therefore acceptable. The staff also verified that the site-specific evaluation was performed by comparing the site-specific structural demands such as forces, moments, shears, internal stresses with the ESBWR structural capacities.

The staff further reviewed the identified changes. The staff confirmed that with the identified changes, the calculated combination of site-specific seismic loads and non-seismic loads, non-seismic standard design loads does not exceed structural acceptance limit of the ESBWR standard design.

No changes to the sizes, again, was necessary for walls and slab thicknesses. Details from staff's evaluation is documented in the FSAR Sections 3.7 and 3.8.

Slide 21, please. ISRs are used for qualification of systems, equipment and components. Site-specific ISRS that exceeds standard design ISRS are used, along with the standard design ISRS for qualification of systems, equipment and components. ITAACs ensure that Category 1 SSCs are qualified for design basis load.

Slide 22, please. In conclusion, the applicant has provided sufficient information to demonstrate that with the identified design changes, the ESBWR standard design is acceptable at the North Anna 3 site. The staff also confirmed that with the site-specific design changes, site-specific seismic demands along with the non-seismic loads met ESBWR structural acceptance limits.

This concludes my presentation, and thank you for your attention. I will now turn over our presentation to Matt Thomas. He will discuss site-specific seismic evaluation of the fuel assembly and control rod.

MR. THOMAS: Thank you, Manas, and good morning Chairman Svinicki, Commissioner Burns and Commissioner Baran. My name is Matt Thomas, and I'm a reactor systems engineer in the Office of New Reactors. I'm one of the technical reviewers who

completed the review of the fuel and control rod sure response aspects of the North Anna 3 combined license application.

On the following slides, I'll present to you the result of the staff's review of the applicant's site-specific structural response analysis for the North Anna 3 GE-14E fuel assemblies and the GE Marathon control rods.

Slide 24, please. As a result of the site-specific seismic exceedance, which was discussed in the earlier presentations by my colleagues Vlad and Manas, the fuel assemblies and control rods experience increased seismic loads at the North Anna 3 site. In accordance with the ESBWR standard design and general design Criterion 2, the staff requested the applicant to show that this increase in seismic load, in combination with hydrodynamic loads, remains bounded by the component's approved capacity limits.

The applicant completed an analysis to demonstrate that the higher site-specific combined loads do not surpass the previously approved capacity limits.

Slide 25, please. Following the guidance in Standard Review Plan Section 4.2, Appendix Alpha, the staff reviewed the applicant's site-specific

analysis of the fuel assembly and control rod structural response to externally applied forces. As part of this review, the staff conducted a regulatory audit of the site-specific calculations in order to confirm that the applicant followed the approved center design methodology.

Slide 26, please. As a result of the review, the staff found that despite the site-specific seismic exceedances, the fuel assembly and control rod design specified for use at North Anna 3 are in compliance with general design Criterion 2, because the increased site-specific combined loads do not exceed the components' previously approved capacity limits. This concludes the staff's Safety Panel presentation, and we appreciate your attention.

CHAIRMAN SVINICKI: Thank you. Before we begin the Q and A for the combined panel, I just want to note that for Mr. Thomas we have identified you as Aaron Thomas. You introduced yourself as Matt. You are indeed the witness that we put forward? I guess you're not his twin brother or something who came in during the break and substituted out, tapped out? Is it Aaron Matthew Thomas? Is that --

MR. THOMAS: Yes ma'am, that's correct.

CHAIRMAN SVINICKI: Okay, thank you very

much. We'll begin the questions -- having established the identity of the witness, we will begin with Commissioner Burns.

(Laughter.)

COMMISSIONER BURNS: Yes, and I am Stephen Gilbert Burns.

(Laughter.)

COMMISSIONER BURNS: Thanks for the presentations. One question I have for the applicant panel, with regard to the results of the reevaluation of the seismic, Unit 3 seismic hazard, you stated in general designs of components and fuel as described are adequate for use at North Anna 3. But you noted that there are some minor adjustments required for some components, and it would be helpful if you could give an example or two of what you're suggesting or what you are alluding to in your testimony.

MR. WADDILL: Sure. I mentioned with the fuel racks in the buffer pool, in two cases the anchor bolts had to be changed. So the size went from one size to the next size up. So it wasn't enough of a change to warrant a major component change. That sort of thing is what we're talking about. The weld again, there was a slight increase in the weld size in order to handle the stress.

COMMISSIONER BURNS: Okay, thank you. Other questions really go to the staff witnesses. My impression from the discussion, and we've had a lot of discussion about the Mineral, the 2011 earthquake in Mineral, and the -- and also how that affected and how it affected this application and we've talked about, we just talked about some of the, you know, minor adjustments to some components, other ways in terms of our analysis.

But I think if my impression is correct, it's not just the Mineral earthquake, but it's also it's sort of was the evolving, it's our evolving approach or analysis of seismic, basically seismicity in the United States. I know this has been an issue, you know. I was a young attorney here in terms of probably right after North Anna 1 and 2 were licensed. But the whole, the whole issue in terms of looking at seismicity in the United States and particularly in the central and eastern part of the U.S.

So I am correct. This not merely an outcome of the particular event in Mineral, but it's also sort of our evolving knowledge in terms of seismic issues that we -- in our analysis. Mr. Graizer.

MR. GRAIZER: Starting from the end, you

are correct. It is a correct understanding that of course we did a lot of studies and we reviewed a lot of papers related and work related to Mineral, Virginia earthquake. But it is correct to say that the biggest changes came from the new, what we call NUREG-2115 or new seismic source characterization for the United States, for the central eastern United States.

It's a huge seven volume document. It supercedes the previous one. It is much more detailed and much more kind of deeply studied. That's number one. Of course number two was mentioned. Our new ground motion prediction equations or GMM, ground motion models, which actually give us the pass from the source to the site.

This model was also updated in 2013. The previous was 2004. This kind of further changes our domain, which influenced the change in seismic hazard.

COMMISSIONER BURNS: Okay. Thanks very much for that. One of the things is the staff's testimony and the staff documentation notes that site-specific in-structure response spectra that exceeds the standard design in-structure response spectra are used for qualification of equipment and components, and that the ITAAC ensures that seismic Category 1

structures, systems and components are qualified to seismic design baseloads.

Are there site-specific ITAAC required to address the exceedances here, beyond what the standard ESBWR ITAAC would cover?

MR. SHEA: Yeah. There is one specific, site-specific ITAAC related to control blades and Matt, do you have -- do you want to add to that?

MR. THOMAS: Yeah. So the applicant provided a site-specific ITAAC for the control blades that was not originally provided in the DCD. The ITAAC itself with the control blades, the goal of it is similar to the goal of the ITAAC for the fuel that was provided in the DCD. So as a result of the increased loading at the fuel and control blades and the core, the applicant took the steps to, you know, ultimately verify and confirm that the as-built fuel and control rods and other structures that go into this analysis can meet the acceptance limits.

COMMISSIONER BURNS: Okay. All right, thanks. I'm going to refer to a Prehearing Question 10, which asked about differences in the wording of the mitigation strategies license condition in the Fermi Unit 3 COL, and the draft combined license for North Anna Unit 3.

In response to the Commission question, the staff said it proposes revising the condition. This is Condition 2(d)(12)(F)(2), just so we're all on the same page, to match the equivalent license conditioning. I would just ask the staff can you confirm that in fact this revision is being made to the North Anna, the proposed North Anna license?

MR. SHEA: Yes. We have an ongoing effort to take all these issues that we've discovered and also with comments from Dominion on the license, to address them in this post-hearing activities, you know. So we would then put forward our proposed changes to those license conditions.

COMMISSIONER BURNS: Okay, thank you. Thank you. Madam Chairman.

CHAIRMAN SVINICKI: Well, let me -- I appreciate that, Commissioner Burns have established that. I think there might have been even more than one reference in responses to prehearing questions, to the need to modify some of the proposed license conditions as laid before the Commission in advance of the mandatory hearing.

So I appreciate the staff's commitment that they will have a close tracking of any of those needed changes prior to -- should a decision be made

to authorize the issuance of the licenses, so that we will correct those matters, which I think are in substantial agreement between the staff and the applicant.

Let me turn to the response to Prehearing Question 7. It was responded to by both the staff and the applicant. A slight difference here in the responses. It refers to the proposed license condition on severe accident management guidelines. The question was "Provide the regulatory basis for a requirement that is proposed to be enshrined in a license condition."

The staff responded that "There is no explicit regulatory basis that requires the SAMG license condition." The applicant's response emphasized, however, that the proposed SAMG license condition reflects Section 18.9 of the design control document.

Now it will come as no surprise to the staff my having inquired of this earlier, that some level of discipline and rigor on substantiating regulatory bases for the imposition of requirements is a personal point of emphasis with me.

This may require a staff witness to come to the podium, since this wasn't strictly addressed by

the staff panel. But could the staff elaborate on its response that there's no explicit regulatory basis, but we did it for Fermi 3, so we propose to do it again? Is there a staff witness that could elaborate on that? Frank, please go ahead and I note, of course, because you've presented you have been sworn in.

MR. AKSTULEWICZ: Okay, yes. This is Frank Akstulewicz. I'm the director, Division of New Reactor Licensing and I have been sworn. So the whole process of how we ended up with where we are on the ESBWR, I'm sorry, on North Anna, has a little bit of a twist to it. So as part of the design-centered review approach, Dominion submitted a license condition to align itself with the RCOLA.

So when we answered, you know, the regulatory basis, we were not going back to substantiate the foundational reason for why a condition was required. We were just referring to the fact that okay, the information was provided as part of a process to align or standardize between the two units.

The history of the conditions that are being used for SAMGs goes back way to the AP1000s, and if the Commission would desire, we'd rather provide

that history chronologically in writing, so we would take that for the record.

CHAIRMAN SVINICKI: Okay. I think it is useful to have a very precise discussion of this, and again the Commission has considered with particularity the continued regulatory treatment of SAMGs, has issued direction on that. And so I get a little uncomfortable when things got a little murky because we have a practice, but the Commission has issued a particular reemphasis on SAMGs receiving a certain regulatory treatment.

So I think we need to have some purity to the Commission's decision-making, as well as continuity with the history of treatment of issues. It sounds like that is fairly complex and would be well served by a written answer from staff that would explain that. So I think it's likely that you would receive a post-hearing question directed to the staff on that point, which will allow you to provide that.

MR. AKSTULEWICZ: We'd be happy to provide that answer, Chairman.

CHAIRMAN SVINICKI: Thank you, and with that I will now recognize Commissioner Baran.

COMMISSIONER BARAN: Thank you. Well, I appreciate the thorough discussion of the seismic

issues, which I think were well-covered, and I wanted to follow up a little bit on the discussion of the license condition for Severe Accident Management Guidelines or SAMGs for Unit 3. We might be able to get a little bit further than we did in just the discussion we had there.

Let me start with just a few questions for Dominion on this. My understanding is that the ESBWR design control document requires a COL applicant referencing the ESBWR certified design to develop site-specific SAMGs as part of its procedure development, and the North Anna Unit 3 FSAR incorporates this provision of the DCD. Is that right?

MS. BORSH: That's correct.

COMMISSIONER BARAN: So consistent with the DCD and the FSAR, Dominion proposed a license condition on SAMGs; is that correct?

MS. BORSH: That's correct.

COMMISSIONER BARAN: Okay.

MS. BORSH: I'm hesitating because --

COMMISSIONER BARAN: You seem hesitant.

MS. BORSH: Yes, because as Frank said, we did not -- we proposed the license condition based on Fermi's application, not because we were reading the

DCD and said oh, it needs to be in there.

COMMISSIONER BARAN: Okay, and so -- and that's a good thing to clarify, so that Fermi Unit 3 is the reference plant for this design, and a substantively similar license condition was in their combined license; is that correct?

MS. BORSH: That's correct.

COMMISSIONER BARAN: Okay, and so a probabilistic risk assessment is required for Unit 3. Does the -- do the Unit 3 PRAs factor in the use of SAMGs?

MS. BORSH: We haven't done, completed the Unit 3 PRA yet. That won't -- that's not required to be completed until prior to fuel load.

COMMISSIONER BARAN: Okay.

MS. BORSH: Approximately 12 months prior to fuel load I believe.

COMMISSIONER BARAN: Do you expect the SAMGs would be incorporated into the PRA?

MS. BORSH: That's a question I'm going to have to defer to our GEH representative. May I? I'm going to ask David Hinds to answer that question please.

CHAIRMAN SVINICKI: And Mr. Hinds, as you approach the microphone, could you state your name,

your affiliation and verify that you've been sworn and are listed as a witness?

MR. HINDS: Hi. This is David Hinds with GEH. I have not been sworn in at this time.

CHAIRMAN SVINICKI: Okay. Well then we need to -- I think I will ask the general counsel to provide that. Would you raise your right hand? Do you swear or affirm that the testimony you will provide in this proceeding is the truth, the whole truth and nothing but the truth?

MR. HINDS: I do.

CHAIRMAN SVINICKI: Thank you. Please proceed with your answer.

MR. HINDS: For the site-specific PRA as was stated, it's committed that it will accomplished approximately one year prior to fuel load. The PRA includes operator actions as needed. The ESBWR, due to its simplicity, does not rely on operator actions for normal operational events or for design basis events.

In the case where a severe accident would be assumed and if an operator action were assumed then yes, the operator action and operator action governed by SAMGs would be included in the PRA. But as I stated, the operator actions are generally not

credited for the ESBWR due to its passive safety nature.

COMMISSIONER BARAN: Okay. Thank you for that clarification. Chairman Svinicki, maybe we could turn to the staff, and I don't know if Frank wants to respond to this or Jim or another staff member or witness. Chairman Svinicki referenced the prehearing response and stated there's no explicit regulatory basis that requires a SAMG license condition.

My sense though, based on the DCD and the FSAR, is that's kind of an incomplete picture, because the ESBWR DCD requires the development of these procedures, right?

MR. AKSTULEWICZ: Frank Akstulewicz again. Yes, I've been sworn in. This gets to the story that I was telling you we need to prepare, in terms of how requirements guide institutionalized or where. So again, I'd defer that question to the written response we'll provide.

COMMISSIONER BARAN: Okay, fair enough. Thank you.

CHAIRMAN SVINICKI: Okay. Well, I thank all of the witnesses on the Safety Panel and those who came to the microphone. It is now 20 minutes after 11:00, and although we're running a little bit ahead

of schedule, I think that we will still plan on reconvening just a little bit earlier than we otherwise would have.

So I think we will resume at one o'clock, and I do ask that it be a very prompt start at one o'clock. So please, we are adjourned for a lunch break until one o'clock. Thank you.

(Whereupon, the above-entitled matter went off the record at 11:21 a.m. and came back on at 1:03 p.m.)

CHAIRMAN SVINICKI: Well good afternoon everyone. I call the hearing to order once again. We will now hear from the Environmental Panel. The parties will address the environmental review performed in connection with the combined license application, including the preparation of a supplemental Environmental Impact Statement.

To provide context for this combined license proceeding, the staff will provide an overview of the environmental review performed in connection with the North Anna early site permit. The staff also will address the NEPA process associated with the combined licensed referencing an early site permit.

I remind all of the witnesses that they remain under oath, and I also advise that witnesses

can and should assume that the Commission is familiar with their prehearing filings. I would begin by asking the panelists from the applicant to please introduce themselves.

MR. MILLER: Good afternoon, Chairman and Commissioners. My name is Keith Miller. I'm the Dominion Environmental Lead for the North Anna 3 project.

MR. BANKS: I'm Tony Banks with the North Anna 3 project.

MR. HEGNER: I'm Joe Hegner, the Dominion Licensing Manager.

CHAIRMAN SVINICKI: I would now ask the applicant witnesses to please proceed with their presentation.

MR. BANKS: Good afternoon Chairman Svinicki, Commissioners Baran and Burns. I'm Tony Banks, and one of my initial mitigating strategies is to clarify that I was sworn in as Louis T, and I go by Tony.

(Laughter.)

MR. BANKS: To some extent, you've read and/or heard information that we have to present, but we think it's a good story worth repeating. With me are Keith Miller and Joe Hegner whom you've heard from

earlier today, and this panel will be presenting a summary of the environmental review conducted for North Anna 3, and an overview of the new and significant information, identification and review process.

Slide 2, please. The overall goal for the North Anna 3 environmental review was to ensure that the potential environmental impacts from the project are known and thoroughly evaluated. The environmental review effort for the North Anna 3 began in the early site permitting process. Following submittal of the early site permit application, the NRC staff conducted a comprehensive review and published its final Environmental Impact Statement in December 2006. This document supported the issuance of the early site permit.

Environmental review of the North Anna 3 site and other offsite areas affected by the project continued, and was performed by Dominion to support preparation of the COLA environmental report. This ER documented environmental issues not resolved during the ESP proceeding, as well as new and significant information.

The NRC staff documented their additional and independent environmental review and supplemental

EIS published February 2010. This document has recommended issuance of the combined license. To support the review for the supplemental EIS, the NRC consulted with various federal, tribal, state and local agencies and listened to many other stakeholders as well.

This was an open and thorough consultation process, which maximized input from those required and other interested parties. Environmental impact conclusions reported in the supplemental EIS ranged from small to moderate.

Slide 3, please. As mentioned in the overview presentation, the early site permit process allows a combined license applicant to defer resolution of certain issues to that application stage. Unresolved issues were given in two categories, those dependent on a specific reactor design and those that can be deferred until COLA submittal.

An issue evaluated dependent on specific reactor design selection is the severe accident mitigation design alternatives or SAMDAs. Examples of unresolved issues from the ESP proceeding included energy alternatives and need for power. Unresolved issues from the ESP proceeding were addressing by

Dominion in the North Anna 3 COLA.

The NRC staff then has documented their evaluation and conclusions related to these issues in the supplemental EIS.

Slide 4, please. A major effort since the ESP final EIS was written is the identification and review of new and significant information. The objective with the new and significant information process is to capture relevant information and evaluate whether it could affect a conclusion in either the NRC's final EIS or supplemental EIS.

The new and significant information process is a multi-step process administered in the North Anna 3 project procedure. It was first used in preparation of the COLA ER. Subject matter expert teams parsed and reviewed key inputs to conclusions in the ESP EIS, identifying if any new information existed pertinent to those key inputs. It was then evaluated for significance relative to the conclusions in the EIS.

If found to be significant, environmental report content was revised to provide evaluation results. Details on the process are also contained in the COLA ER. Some examples of new and significant information identified during the COLA process are a

new 500 kV transmission line not realized during the ESP process; a large component transport route; acquisition of additional property to support construction; radiation exposure to construction workers; and seismological conditions and impacts.

While geological make-up may not have changed, we accounted for the Mineral earthquake and did not see any environmental impacts associated with that event.

Slide 5, please. The reviews for new and significant information have continued through the years for environmental review and are still continuing. This thorough process provides assurance that we as the applicant are identifying changing conditions and evaluating the effect on past conclusions made.

The new and significant information process has been audited several times during the application review, most recently by NRC staff in June 2016. The exit briefing noted that Dominion followed its methodology and provided documentation of its implementation.

The NRC has a parallel process for identifying and evaluating new information. These independent reviews by the staff have also been

continuing. This concludes our panel remarks. We look forward to addressing your questions. Thank you.

CHAIRMAN SVINICKI: Thank you for that presentation. I'll now ask the NRC staff witnesses to move into position behind their nameplates, and please begin by introducing yourselves and then proceed to your presentations.

MS. DOZIER: My name is Tamsen Dozier. I'm sorry. My name is Tamsen Dozier. I am the Environmental PM for the North Anna 3 application.

MR. KUGLER: My name is Andy Kugler, and I'm an Environmental Project Manager for New Reactors, and I've worked on the North Anna application.

CHAIRMAN SVINICKI: Thank you. Please proceed.

MS. DOZIER: Good morning Chairman and Commissioners. I'm doing the introduction again. My name is Tamsen Dozier from the Division of New Reactor Licensing, and am the current project manager for the environmental review for the North Anna Unit 3 combined license application.

Slide 2, please. With me is Andrew Kugler from the Division of Site and Environmental Analyses. Today, we will be presenting the staff's environmental review of the North Anna 3 application. In presenting

how the staff conducted its environmental review, we will focus on how we fulfilled the agency's obligation under NEPA as set forth in the agency's regulations in 10 C.F.R. Part 51.

Consistent with the findings summarized in the staff's SECY information paper, this presentation will outline for the Commission the adequacy of the staff's review and why it supports the issuance of the requested combined license.

Slide 3, please. This slide briefly describes the structure of today's presentation. The NRC's regulations require that for a COL referencing an early site permit or ESP, the staff is to prepare a supplement to the Environmental Impact Statement prepared for the ESP.

Mr. Kugler will first explain the role of the North Anna power station ESP EIS in the COL review. He will describe the structure and key findings of the ESP EIS as the starting point for the development of the COL supplement. I will then describe the process that the staff used to prepare the supplement for the COL review, which I will refer to here as the COL SEIS.

I will outline the staff's evaluation of findings in the various resource areas covered by the

review. Finally, I will describe the process the staff used to identify and evaluate new information since the issuance of the COL SEIS. I will describe how the staff determined that a supplement was not warranted, and that the impact evaluations in the COL SEIS remained valid.

I will now turn to Mr. Kugler for a summary of the environmental review for the early site permit.

MR. KUGLER: Thank you, Tammy, Chairman, Commissioners. Slide 4, please. I'd like to start by discussing three different aspects of the North Anna ESP. First, similar to most of the other ESP reviews, the North Anna ESP used the plant parameter envelope or PPE approach, in which no specific reactor design was chosen as a source of parameters for analysis during the ESP review.

Instead, the review relied on a set of design parameters that served as a surrogate for actual design information. The design parameters were developed by Dominion using seven different reactor designs.

Dominion's environmental report in support of the ESP and subsequently the NRC's EIS for the ESP evaluated the impacts of construction of two new

reactors at the site, with design characteristics bounded by the PPE.

Second, in 2007 the NRC published revisions to its rules related to limited work authorizations or LWAs, which revised the definition of construction activities in 10 C.F.R. 50.10. This rulemaking excluded from NRC jurisdiction certain activities such as site preparation and building of service facilities at the site.

In addition, the revisions removed the option to authorize LWA-type activities through the ESP itself. Based on the revised rule, a separate LAW would be required for such activities. The rulemaking provided that ESP applications that were under review at the time the rule became final are required to comply with the previous version of the rule.

Therefore, the term "construction" in the North Anna ESP EIS and COL supplemental EIS is based on the previous rule and includes activities that would now be considered pre-construction in new reactor EISs that the NRC has issued since the rule.

Finally, as permitted by NRC regulations, some issues were deferred at the time of the ESP to be addressed in the combined license application. Likewise, a limited number of issues were determined

by the NRC to be unresolved during the ESP review. These issues also had to be resolved during the review for the COL application. I'll discuss these items further in a moment.

Slide 5, please. As directed by the regulations, the final EIS for the ESP was a key starting point for the development of the COL supplemental EIS. I will now briefly summarize the conclusions in the ESP EIS. The ESP conclusions were reached using significant level definitions of small, moderate and large.

These definitions are based on guidance developed by the Council on Environmental Quality. They consider whether environmental impacts are detectable and if so, whether they are sufficient to noticeably alter or destabilize important attributes of the resource. The staff found in the ESP EIS that with a few exceptions, the environmental impacts of construction of two new units at the North Anna ESP site would be small. For many resource areas, the EIS explained why impacts would be temporary or would be mitigated.

In a few subcategories of socioeconomic resource areas, such as transportation and housing, the staff determined that adverse impacts would be

small to moderate. In addition, there would be some beneficial impacts on the subcategories of economy and property taxes that would be small to moderate.

Slide 6, please. During plant operations, the staff also concluded that most impacts would be small. However, the staff determined that impacts from plant operation on water use would be moderate during drought years. The staff also identified small to moderate impacts during operations to aesthetics and recreation. Finally, the staff concluded that there would be small to moderate beneficial impacts to the economy, and small to large beneficial impacts from tax revenues.

Slide 7, please. As permitted by the regulations, the applicant chose to defer the evaluation of the need for power and of energy alternatives to the combined license review. Therefore, these issues were not evaluated in the EIS to the ESP.

In addition, the staff was unable to resolve a few issues in the EIS to the ESP. Because information on the exact composition of water effluence was not known during the ESP review, operational impacts on water quality were unresolved. The chronic effects of electromagnetic fields were not

resolved because conclusive scientific information was not available.

In addition, the staff could also not resolve the consideration of alternatives to portions of the cooling system. Finally, because a specific reactor technology had not been chosen, the NRC staff was unable to resolve the impacts of accidents and severe accident mitigation alternatives, the fuel cycle, transportation of radioactive materials and decommissioning.

Slide 8, please. By rule, in the EIS for the ESP the staff must reach a conclusion regarding the site chosen by the applicant. For the North Anna ESP, the staff examined three alternative sites and concluded that there was no environmentally preferable alternative site, and therefore that there was no obviously superior alternative site.

Dominion's ESP application included a plan for the redress of certain activities related to site preparation and nuclear unit construction that would be permitted under the ESP. In accordance with the regulations in effect at the time of the application, the NRC staff reviewed and approved the site redress plan and the ESP authorized those activities to take place. I will now turn it back over to Ms. Dozier to

discuss the review and conclusions for the combined license.

MS. DOZIER: Slide 9, please. Upon acceptance of Dominion's COL application, the staff conducted a scoping process which focused on issues that were deferred or unresolved in the ESP and on any new and significant information with respect to the issues that were resolved at the ESP. As the applicant has stated, Dominion's environmental report was likewise focused on issues not evaluated or resolved in the ESP and on new and significant information.

An audit was conducted where the staff gathered information for its independent evaluation for the COL review, and evaluated the applicant's process for identifying new and significant information for resolved issues. The environmental standard review plan includes guidance for a COL application referencing an ESP, and aids the staff in determining whether or not information is new and significant.

For information to be significant for the purposes of including in the COL SEIS, it must be material to the issue being considered; that is, it must have the potential to affect the staff's finding

or conclusions from the ESP EIS. After completion of the audit, the staff identified areas where additional information was needed to complete its review, and submitted requests for additional information to the applicant.

The staff also conducted its own independent search for new and significant information concerning issues resolved in the ESP EIS. The process included, but was not limited to, contacting applicable federal, state, tribal and local agencies. In particular, the staff contacted the Virginia Department of Historic Resources, the Virginia Department of Environmental Quality, Virginia Department of Game and Inland Fisheries, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers and 17 state and federally recognized Indian tribes in order to gather relevant information.

Slide 10, please. Issues that were deferred or unresolved during the ESP review were evaluated by Dominion in its environmental report and reviewed by the staff. Of particular note are the staff's evaluation of the need for power, alternative energies, alternative system designs, additional systems design alternatives and severe accident mitigation alternatives.

The key new information for resolved issues provided by Dominion during the staff's review of the COL application included additional project elements not evaluated during the ESP. This included the need for additional transmission lines, newly acquired property to support construction activities and the need to transport large components to the site.

It is important to note that because the suitability of the site is the central determination made in an ESP, the COL supplement does not contain the discussion of alternative sites. While alternatives sites were required to be examination in the ESP EIS, by rule they are not reconsidered at the COL stage.

Slide 11, please. This slide shows an overview of all the review areas covered by the ESP EIS and the COL SEIS. The areas which were resolved during the ESP are shown in black font. Those areas which were deferred or for which some portions were unresolved at the ESP stage are shown in yellow.

For those areas resolved during the ESP stage, with the exception of alternative sites the staff determined whether new and significant information was identified and found that no impact

levels would be changed from the ESP EIS. For those issues deferred or unresolved during the ESP, the staff determined those impact levels were small.

The staff determined that there is a need for the baseload power, which will be produced by the new unit, by the proposed new unit, and that there are no environmentally preferable alternative energies or alternative systems.

Slide 12, please. The draft COL was issued in December 2008. The staff held a public comment meeting in February 2009 and collected comments on the draft SEIS. Staff's consideration of comments are included in Appendix E of the final COL SEIS, which was issued on March 24th, 2010.

Slide 13, please. 10 C.F.R. 51.92 requires the staff to prepare a supplement to a final EIS if there are substantial changes in the proposed action that are relevant to environmental concerns, or if there are new and significant circumstances or information relevant to environmental concerns that bear on the proposed action or its impacts.

The staff is also directed to prepare a supplement if it determines that it serves the purpose of NEPA to do so. Since the publication of the COL SEIS, the staff has remained aware of any new

information that would require that a supplement to the SEIS be prepared.

For example, the staff was preparing a supplement due to Dominion's change in reactor design to the USAPRW, a design not considered in the ESP PPE. But the plans to supplement were withdrawn when Dominion reverted back to the ESBWR design.

Slide 14, please. There is an established process that the Office of New Reactor staff uses to determine whether new information warrants a supplement to a new reactor EIS. The staff has followed that process in the time since the publication of the COL SEIS to determine whether a supplement to that document is warranted, and that process is presented here.

For those reviews where there is an anticipated delay between the publication of the EIS and the mandatory hearing, the staff follows the office process for identifying new information that would need to be considered for its potential to be significant to the previous evaluations, meaning whether the new information would present a seriously different picture of the environmental landscape.

The staff considers the new information and in some cases will formally evaluate the new

information. The staff then makes a determination as to whether the new information warrants that a supplement be prepared.

Slide 15, please. Part of the staff's process for identifying new information included interactions with other agencies. The staff became aware of new listings for endangered species in the project area. This necessitated additional consultations with both the National Marine Fisheries Service and the U.S. Fish and Wildlife Service.

These consultations have concluded, and both the National Marine Fisheries Service and the U.S. Fish and Wildlife Service have concurred with the staff's determination that the project is not likely to affect any federally listed species under each of their respective jurisdictions. Therefore, the staff has determined that new listings of endangered species does not warrant a supplement to the COL/SEIS.

The staff has similarly identified and considered other new information. In addition, Dominion has likewise remained aware of new information which could have the potential to warrant a supplement. The staff audited Dominion's process for identifying new information and reviewed the new information that had been identified which Dominion

considered.

The staff found Dominion's process adequate and concluded that none of the new information identified warranted a supplement. Therefore, based on this consideration and the new information identified since the publication of the COL SEIS, the staff determined that a supplement to the COL SEIS was not warranted.

Slide 16, please. In summary, the environmental impacts for most resource areas are small. None of the alternative energy sources or system designs would be environmental preferable, and new information did not affect these conclusions. As stated in the COL SEIS, the staff recommendation related to the environmental aspects of the proposed action is that the COL should be issued.

The information supporting the recommendation comes from the North Anna 3 COL environmental report, consultation with federal, state, tribal and local agencies, the staff's own independent review and the staff's consideration of comments received during the public scoping process and the comment period on the draft COL SEIS and the assessment summarized in the final SEIS. This concludes the presentation.

CHAIRMAN SVINICKI: Well thank you to both the Dominion and NRC staff environmental panelists for those presentations.

I will begin the questioning for this panel, and I have two questions, both of which I'm going to direct in the first instance to the NRC staff, so I would ask that they stay in position in front of their microphones.

The first is about the staff's response to Prehearing Question 27. In that response, the staff discussed the two different standards that the staff utilizes for considering new and significant information, one for preparing the supplement to the ESP EIS at the COL stage, which has potential to effect the findings or conclusions, and one for supplementing the SEIS for the COL. That standard is "provide a seriously different picture."

At a very high level, could the staff please comment on how it views the two standards as being the same or fundamentally different, on whether or not it makes sense or what impact it has to have the two different standards, and given the important role that these supplementation standards have played in previous reviews, would the staff offer any observations about the use of the two standards?

MS. DOZIER: Yes. When we talk about two standards, it's actually the processes that you're thinking about. So in the situation where you are doing a COL, you're doing your SEIS and you're referencing the ESP, the decision has already been made to prepare a supplement. It's already been triggered by the regulation.

So therefore you are determining what you're going to look at during -- for the resolved issues. The COL SEIS will automatically fully review any deferred issue or unresolved. So you're basically talking about only those issues that were resolved at the ESP stage. And therefore so what we do then is -- and that starts with the applicant's environmental report. They then look for anything that is potentially significant in terms of -- that can potentially change the findings of the ESP EIS.

For the second situation, you have completed your supplement and then you're just making sure that the COL SEIS for in this case North Anna, you are making sure that the supplement that you have prepared remains valid, that the evaluations remain valid and therefore you do a look for potentially significant.

But what would trigger a supplement is the

different, is the difference here. You're looking for what would trigger a supplement, which would be something that would present a seriously different picture of the environmental landscape. So the processes that you are actually using are the same, but you're doing -- one thing you're deciding what you discuss in a supplement that you're already preparing; in the second case what would trigger a new supplement.

CHAIRMAN SVINICKI: Okay. Thank you for that. I think that's very helpful. My second question is in its response to Prehearing Question 30, the staff notes that changes in the ESBWR design certification would not affect the SAMA analysis, and this is the staff's response. "In part due to the significant margin that exists between the total averted cost and the lowest SAMA cost."

Could the staff please describe the magnitude of this "significant margin" in very general terms?

MS. DOZIER: Yes. That question is best directed to the technical staff, so I'm going to ask Don Palmrose if he would come to the podium.

CHAIRMAN SVINICKI: Okay, thank you, and if you could introduce yourself, your affiliation and

then indicate whether or not you've been sworn in.

MR. PALMROSE: Dr. Donald Palmrose, senior reactor engineer, Office of New Reactors. I am a sworn witness.

CHAIRMAN SVINICKI: Okay, thank you.

MR. PALMROSE: In the case of the ESBWR design's SAMA evaluation, as was put forward in the design certification portion of the review, the lowest cost alternative that was considered was -- had a value of $1 million. And so in going through and looking at the situation for the North Anna, of putting that reactor at that site, the total averted cost would come out to a much lower value.

And so even though at the COL stage for the supplemental EIS we came up with one set of values for that total averted cost, intervening time has changed with the design certification being finalized, plus updated information regarding the site that then changed the values. So it increased the total averted cost for the site, but it still was far below that $1 million lower cost for the alternative.

CHAIRMAN SVINICKI: Okay, thank you for that response, and with that, I will turn to Commissioner Baran.

COMMISSIONER BARAN: Well thank you all

for your presentations. I think most of my questions are for the staff, so you guys can stay put. One of the changes to the planned project that came after publication of the final supplemental EIS is the addition of the new barge roll-off facility and transport route for large components.

This change required the applicant to apply for a new Section 404 permit from the Army Corps of Engineers, led to new commitments related to Section 106 of the National Historic Preservation Act, and was a topic of new NRC consultations with the Fish and Wildlife Service and National Marine Fisheries Service under the Endangered Species Act.

The staff has proposed including several of these commitment as license conditions in the environmental protection plan. So this change generated a large amount of new information on the project. Can you walk us through how the staff determined that all this new activity and information did not require supplementing the EIS?

MS. DOZIER: I'm going to call the technical staff to help me out with that, but first I think you said something about apply for a new permit, that --

COMMISSIONER BARAN: Section 404 permit?

MS. DOZIER: Right, the Section 404, the original permit was -- covered that.

COMMISSIONER BARAN: Oh, it did?

MS. DOZIER: Yes, yes. So it was, it did, it was the Corps permit that was issued in 2011 covered the entire project. It was -- and that was a portion of it.

COMMISSIONER BARAN: Okay. Well thank you for that.

(Off mic comments.)

MS. DOZIER: Yes. It had not been -- it had not been -- the permit had not been obtained in the EIS, right? I'm sorry.

COMMISSIONER BARAN: It was subsequent to the EIS.

MS. DOZIER: Right, yes, yes.

COMMISSIONER BARAN: Okay.

MR. KUGLER: Right, but these portions were addressed in the supplemental EIS. These did not -- we were aware of them when we wrote the supplemental EIS. So we were already writing a supplement, and they were already included, just to be clear.

MS. DOZIER: It was additional information. We found out additional information. We

knew about -- we knew about the transport of large components. It was -- but we did find out more, more additional details as the project matured, right.

So that -- I just wanted to make sure that was, before I -- but we did do a -- but as those additional information became available after the SEIS, we did do an evaluation. So I'm going to ask the technical staff to -- Peyton Doub, to come to the stand and he can elaborate on the details of that information.

CHAIRMAN SVINICKI: And again, please introduce yourself, give your association or affiliation with the project and indicate whether you've been sworn.

MR. DOUB: My name is Peyton Doub. I am a terrestrial ecologist and wetlands scientist, environmental scientist with the Office of New Reactors, and I have been sworn.

CHAIRMAN SVINICKI: Thank you.

MR. DOUB: The staff did a complete update of its endangered species, its review of impacts on endangered species through a supplemental biological assessment that starting with the initial biological assessment that was prepared for the ESP, the staff visited the site, performed research, met with the

Fish and Wildlife Service, met with NMFS, the National Marine Fisheries Service, compiled information on all of the affected species, including several newly listed species that had occurred since the ESP, including the northern long-eared bat and sensitive joint-vetch, and the Chesapeake, the population segment of the Atlantic sturgeon.

The staff then prepared an updated biological assessment for the Atlantic sturgeon, and a supplemental biological assessment for the Fish and Wildlife Service species for the project, including all of the species that were addressed at the ESP stage, bringing the information up to date for like the ten years plus intervening period, plus addressing the newly-listed species including the northern long-eared bat and the sensitive joint-vetch, and addressing an action area that included not only the regional activity through recovery in ESP, the additional activities that were covered at the COL stage, plus we brought all the information up to date on the Walkerton roll-off facility and the large component transport route, and we expanded the analysis to also include a 24.5 mile segment of the Mattaponi River, where there was a question about potential barge, potential effects of the barge

traffic on sensitive joint-vetch, a threatened plant species.

The staff concluded for all these species that there would either be no effect or that they may affect, but would not likely adversely affect any of these listed species. We received concurrences from both the National Marine Fisheries Services in November of 2016, and the U.S. Fish and Wildlife Service in February of 2017, concluding, fully concluding the Section 7 consultation process under the Endangered Species Act, bringing it fully up to date for the entire project as it currently stands.

COMMISSIONER BARAN: Let me -- thank you for that. That's a lot of information. That's really helpful. I get the sense that if I actually ask you to recite from memory the entire supplemental EIS, you could do it. I appreciate that.

(Laughter.)

COMMISSIONER BARAN: In the staff's written responses to our prehearing questions, the staff stated that because the NRC's Endangered Species Act consultations are now complete as you said, the staff expects that the Army Corps of Engineers will reinstate the Section 404 permit. How confident are you that the Corps of Engineers will reinstate the

permit, and when do you expect this to occur?

(Simultaneous speaking.)

MR. DOUB: I'll let Tammy answer that question.

MS. DOZIER: Right, because I have spoken with them this week. Last week, the NRC sent a letter to the Corps, summarizing, sort of a one-stop shop for them for all of the information on all of our consultations, so that it was all in one document and all the ADAMS ML numbers of all the different things that Peyton has memorized but the Corps has not.

And so I spoke with them this week and they are -- they are moving toward reinstating the permit.

COMMISSIONER BARAN: Okay. The environmental impact determinations in the EIS assume that the mitigation measures in the Section 404 permit will be implemented. If the Corps of Engineers did not reinstate the Section 404 permit for whatever reason, what effect would that have on the staff's environmental analysis?

MS. DOZIER: There are many cases where we -- well first of all, when the environmental analysis in the SEIS, that was -- that predated the Corps' initial issuing of its permit. So often we do look

forward to permit issuances, because we know that before Dominion does do certain activities, they have to receive the permit.

So if for whatever reason Dominion does not, you know, receive the permit, then the activities that we relied upon impacts for, those impacts would not occur because the -- we would have made the assumption that the permit would be obtained before they do the permitted the activities that would result in the impacts.

COMMISSIONER BARAN: Let me ask -- let me ask a question to clarify, and I understand this is probably a counterfactual situation, because it sounds like the Corps is going to issue the permit. But let's say, you know, you had talked this week to the Army Corps of Engineers and they said you know what? We're not going to reissue the permit. Is that something that would trigger a supplement or what effect would that have on our process if for whatever reason they were not going to reissue the permit?

MS. DOZIER: Well, I would assume it's a temporary thing because, you know, they're eventually whatever reason they are not issuing it now, they would -- they would work out with Dominion and then Dominion would proceed to, you know, take care of

whatever the problem is. As in many applicants do with Corps of Engineers when there's issues in getting permits, you work out the wetland mitigations or whatever.

MR. KUGLER: If I can add to this, so without a Corps permit, they could not proceed with the project. They have to have the Corps permit. So if they don't have one, the project doesn't proceed. If the current permit were cancelled by the Corps, eventually if the project were going to go forward at all, they would have to have another Corps permit.

It is likely that the conditions in such a permit would be similar. The Corps is fairly consistent in the way they operate. But we -- when we do our evaluations under the National Environmental Policy Act, what we have to determine is that the mitigation is reasonably foreseeable. It's never certain for something that's going to be future like this.

If it's going to be a Corps permit, we consider that reasonably foreseeable. So we do depend on it in the sense that we expect that the Corps will properly manage the resources for which they're responsible.

COMMISSIONER BARAN: Okay. Thank you. I

have another question about when it's necessary to supplement an EIS. The need for power section of the final supplemental EIS is based on the environmental report filed in 2007, and it concludes that there will be a need for power from North Anna in 2017.

In its responses to prehearing questions, Dominion stated that it provided the staff with an updated analysis in 2013 that was based on new information. But the staff found that this new information did not require a supplemental EIS. Dominion mentioned earlier that it developed a 2016 integrated resource plan. Has the staff evaluated that plan in the context of the need for power analysis?

MS. DOZIER: They have, and would you like an explanation?

COMMISSIONER BARAN: Sure.

MS. DOZIER: Okay. I will call Mr. Mussatti to the stand to discuss his evaluation.

CHAIRMAN SVINICKI: And please state your name, your association with the review and whether or not you've been sworn in as a witness.

MR. MUSSATTI: My name is Daniel Mussatti. I'm the senior economist for the RENV Branch of DSEA, and I have been sworn in.

CHAIRMAN SVINICKI: Thank you.

MR. MUSSATTI: We, as part of our standard operating procedures, continue to look at new information as it comes in, from the day that we published Environmental Impact Statement until the time we get done with a meeting such as this one here. That means that every year, when the new IRP, the Individual -- the development plan for the power plant, every year that one of those comes out we take a look at it again.

Andy looks at it from the standpoint of is there some new alternative generating capacity out there that we might need to consider, and I look at it from the standpoint of is there a new story being told about the need for power? So the question you asked is kind of incomplete in one respect, in that we didn't just look at the 2013 and then the 2016; we looked at the ones that came out every year.

The latest one that we looked at was the 2016 that came out oh, I think it was like January when it came out in fact, if I remember correctly. And in 2015, we did an update of the need for power under new and significant information and put together a report on that.

Basically, the story is the same that's

told by all of them. Dominion, when they developed their development plans for the future, they look at potential things that could be installed to meet new demand.

But they caution inside their IRP that nothing that is in here is guaranteed that it's going to happen, and things that aren't in here are not guaranteed that they're not going to happen. So it kind of leaves it open, but they are presenting reasonable ways for -- for them to be able to achieve future demand requirements without having any problems with reserves and with potential brownouts and blackouts and these sorts of things.

So we've taken a look at it in the same context as them. If they're going to look at it as everything's on the table, then we need to look at the same way. So we've looked at the idea of this is what is available right now.

We know what the growth is expected to be out to the future and we compare that difference and say is there room for this nuclear power plant to be a part of that solution, and that answer has not really changed since the first time we did it.

COMMISSIONER BARAN: Okay, thank you. I want to ask about one more topic. One of the aspects

of the environmental review that was the subject of a significant number of public comments is the plan to raise the water level of Lake Anna by three inches, and to change downstream river flows to accommodate the hybrid cooling tower for Unit 3.

In particular, members of the public expressed concern about how these changes could affect recreational activities on both the lake and river. Between the draft and final supplemental EIS, Dominion and the Commonwealth of Virginia performed a study on potential changes to water levels, and the resulting effects on recreation and ecology.

In the final EIS, the staff found that impacts would mostly be small, but that in times of drought, the impact on lake recreation could be moderate at some shallow locations. Can you discuss the basis of the staff's determination that the impact could be moderate, and what mitigation actions Dominion would implement to mitigate these impacts?

MS. DOZIER: Would that Dan or Phil?

MR. KUGLER: Maybe both.

MS. DOZIER: I'm going to ask -- we're going to start out with a hydrologist to talk about how he came up with the hydrology aspect of that. But you asked about recreation, so we may have to switch

gears. Did you want to start off?

MR. MEYER: Well, I was hearing recreation a lot. Sorry. My name is Philip Meyer with the Pacific Northwest National Laboratory, in support to NRC.

CHAIRMAN SVINICKI: And have you been --

MR. MEYER: And I have been sworn.

CHAIRMAN SVINICKI: Thank you.

MR. MEYER: So I heard a lot of recreation, so I apologize. But if you would just restate your question.

COMMISSIONER BARAN: Sure. Can you just walk through the basis for the staff's determination that the impact could be moderate, and what mitigation actions Dominion would implement to mitigate these impacts?

MS. DOZIER: To recreation?

COMMISSIONER BARAN: Correct.

MS. DOZIER: Or to, okay.

MR. MEYER: I can talk a little bit about the water levels.

COMMISSIONER BARAN: yes.

MR. MEYER: And what did associated with that. So my role is mostly water use issues, understanding the hydrology of the lake and the

management of the lake. So those issues were closed at ESP, but we did have a process to look at new and significant information, and one of the significant or one of the new pieces of information that we evaluated the significance of with respect to our conclusions in the COL SEIS was the permit for water use from the VEQ.

And relevant to your question, there's a couple of permit conditions in that that affect recreation. One is that they have -- and downstream water use. One is that they have modified the operation of the lake a little bit to allow for a reserve when the water levels get down low. They want to have a reserve so that they are able to discharge an additional 24 cfs from the dam, to increase the flows in the river below the lake.

So they hold this in a reserve to affect mainly downstream water supply issues, but there might be some recreational issues there too. The other thing is hat in the permit, they have a requirement that there be certain levels of releases on weekends in May and June, and those increased releases. So a minimum of the release from the dam, and that's specifically to address recreational issues.

COMMISSIONER BARAN: Okay, and when the

staff made the finding that during drought conditions, the impacts could be moderate at some shallow locations, did the staff take into effect the expected effects of climate change in the duration and intensity of droughts?

MR. MEYER: That's a little bit of a difficult question. So from a water use perspective, we did look at the impact of climate change, and we reviewed the most recent National Climate Assessment. That's the basis for the staff's, because we're not climate experts. We review the GCRP reports for -- the most recent National Climate Assessment was in 2014, so it was subsequent to this COL SEIS.

We did review that for information and to see how it compared to what the staff had relied on in the COL SEIS. Our review of that, there's some -- the evidence is that precipitation overall is expected to increase, and that temperatures are going to increase. So that would increase the evaporation, which is a significant sink from the lake and also affects the operation of the plant.

We looked at that and we also looked at the evidence in the record for past occurrence of drought. We looked at the National Climate Assessment to see if they had any information about the

occurrence of drought. There really isn't any. They expect water availability in the region to decrease slightly, I think it was five percent in the report. So overall, the evidence didn't suggest that drought would be more frequent. There's still an uncertainty that we really couldn't make a decision one way or the other.

COMMISSIONER BARAN: Okay, good. Very good. Thank you.

CHAIRMAN SVINICKI: Thank you. Commissioner Burns.

COMMISSIONER BURNS: Yeah, I have a couple of questions for the applicant, and this goes to some of the consultations and commitments made in response to evaluations of the Endangered Species Act. In response to Prehearing Question 12, you discussed the staff's consultation with the Fish and Wildlife Service under the Endangered Species Act, and with respect to --

You noted that it would affect this joint-vetch or sensitive, excuse me, sensitive joint-vetch, populations along the barge transport route that Dominion has sent a letter committing to additional measures for avoiding impacts. Could you generally describe some of the additional measures that Dominion

committed to?

MR. BANKS: I'd ask Mr. Miller to go ahead and address that.

MR. MILLER: So in December, as was discussed earlier, NRC staff issued a supplemental biological assessment which addressed, among other things, effects on the sensitive joint-vetch from West Point up to Walkerton, Virginia due to barge traffic. Subsequent to that, it became clear there were still some concerns with respect to effects on the vetch during those barge, those barge transits.

So Dominion drafted a letter, which we sent to the NRC, which committed to additional measures to protect the vetch. The many pieces of that are we committed to submitting a report to the Fish and Wildlife Service no later than six months prior to initiating barge transits.

In that report, we would ask for concurrence from the Fish and Wildlife Service on the measures that we'd be taking to avoid, minimize or mitigate effects on the vetch.

COMMISSIONER BURNS: Okay, thanks. Another aspect relates to the consultations under Section 106 of the National Historic Preservation Act, and the staff discussed in its answers condition and

the combined license relating -- minimizing impacts on archaeological sites, and it commits Dominion to implementing a ground disturbance plan. Could you, again it could be a high level, describe what the ground disturbance plan is?

MR. BANKS: Sure. The ground disturbance plan that we have in place and as a result of consulting with SHPO ourselves and also working with NRC, involves a matter of understanding the kinds of impacts that could be affected on the shoreline, that we would commit to understanding the type of soils and other kinds of vegetation that may be on that barge roll-off facility, and we also have procedures in place that says if there is something else that becomes an inadvertent discovery during the process of ground disturbance, we have notification protocols in place.

COMMISSIONER BURNS: Okay. So that type of discovery might be some of an archaeological find or something like that?

MR. BANKS: Correct.

COMMISSIONER BURNS: Given that we say North Anna probably 1 and 2 was the first nuclear power plant site I ever went to and it was 1978, so Unit 2 was not yet operating although -- and I also

recall seeing, you know, the parts of the construction for Unit 3 and 4. Now I understand Unit 3 from the visit I made about two years ago. This unit, the proposed Unit 3 we're talking about now is really not on the same -- it's not in the same locales where the 3 and 4 were.

So it's interesting to me. So what don't you -- what hasn't been disturbed in that area since obviously in 3 and 4, when they were being potentially built in the 1970's and the early 80's, you know, obviously disturbed. What's unknown? What's the unknown frontier, if you will in terms of --

MR. BANKS: That's a great question, and I believe I understand what you're asking. But to be honest with you, the entire site has been evaluated by SHPO as the area of potential effects.

COMMISSIONER BURNS: Okay.

MR. BANKS: So while you might be thinking about the abandoned Units 3 and 4 in one particular area of the North Anna site, and the proposed Unit 3 in another area of the site, the entire site has been disturbed.

COMMISSIONER BURNS: Okay, all right, thank you.

MR. BANKS: And has been evaluated by

SHPO.

COMMISSIONER BURNS: Okay, thanks. Let me turn to staff, the staff witnesses, both Ms. Dozier and Mr. Kugler, you touched on the differences in terms in environmental evaluation in the context of pre-2007, when the Commission adopted changes to focus its review on -- focus its NEPA review in terms of what it views in terms of its obligations.

What practical significance does that have today, and I guess what practical significance, if any, what if a COL were to be issued? Does that difference in will you really have any difference once the COL is issued?

(Off mic comments.)

MS. DOZIER: It basically has to do with where the impacts are discussed in the EIS, in terms of what defines construction and pre-construction. I'm assuming you're talking about the pre-LWA rulemaking.

COMMISSIONER BURNS: Right.

MS. DOZIER: Okay. So in most of the environmental impact statements that you have been looking at thus far that came -- actually came after North Anna, you have seen a lot of discussion of things being -- first of all, they were -- most of

them were cooperating with the Corps of Engineers, which in this case we were not.

But you saw a lot of, you know, the NRC's portion of a particular activity. It was all considered all under the same type of thing. We didn't parse between what our NRC regulated and not regulated.

COMMISSIONER BURNS: Okay, but I think it was actually Mr. Kugler referred to it, in terms of some restrictions on what the applicant could do today with respect to site preparation?

MS. DOZIER: Oh, okay that.

COMMISSIONER BURNS: So that's what I'm trying to understand.

MR. KUGLER: Okay. So actually what I was referring to there, the way the rule changed, under the old rule we could authorize some activities which were typically limited work authorization type activities, where we could actually authorize it under the early site permit itself.

So there would be no LWA; there would just be an early site permit, and we did that with North Anna. Under the new rule, you cannot do that. The ESP is simply a siting permit, and if they wanted to do any of those LWA-type activities, they would need

a separate LWA.

COMMISSIONER BURNS: I see, okay. I think I understand now.

MR. KUGLER: Okay.

COMMISSIONER BURNS: And finally as I understand it, the early site permit for North Anna actually looked at the possibility of up to 45 -- well, from 4,500 to 9,000 megawatts thermal, which essentially assumes a potentially two unit site. So then I guess what I'd take from that, it's fair to say that some of the impacts predicted from operation of a proposed single unit would be, expect to be less significant or severe, if you will, than impacts that were evaluated under the early site permit.

I realize it may not be. It's not necessarily a purely mathematical proportion reduction. But if there's any light you could shed on that, I appreciate it.

MS. DOZIER: Well yes. It was -- and in fact I think if you read in some of the evaluations, the reviewer would state impacts are smaller for the COL because not as big -- not as large a footprint. Land use, I think, would be a good example of the impacts would be smaller than the ESP would have predicted, in terms of the onsite impacts.

COMMISSIONER BURNS: Okay, okay, thanks. Thanks, Madam Chairman.

CHAIRMAN SVINICKI: Okay. I would now like to reset the tables for the applicant and the staff for those witnesses who will join in the closing statements. I'll just provide a moment here for the tables to be reset.

(Pause.)

CHAIRMAN SVINICKI: Okay. We will begin with a closing statement by the applicant.

MR. MITCHELL: Chairman, Commissioners, first I would like to thank everyone that has made this mandatory hearing possible and so successful. I am thankful that we have such a professional team here at Dominion that has worked for many years to support the staff and their thorough safety and environmental review, which I believe have generated complete and comprehensive findings.

I would like to thank our colleagues at GE Hitachi, Bechtel, Fluor and all the contractors for their support and contribution to our COL application. Finally, I would like to thank the Commission for having us here today and for the time and effort that you devoted to this review. We appreciate your thoughtful and challenging questions, both during and

before the hearing, and we look forward to answering any remaining questions you may have.

As presented in our application in this hearing today, the ESBWR is an excellent design that has been demonstrated to be safe and an appropriate technology for the North Anna site. North Anna 3 is a valuable option to meet our growing energy needs and in addition would provide a baseload carbon-free resource which requires minimal land use.

Nuclear power offers proven operational, economic and environmental benefits, and this project is an important resource for our customers. As shown through history, forecast change over time and fuel diversity is a key component to any energy plan. Our customers enjoy some of the lowest rates in the United States due in large part to the safe, reliable, clean and dependable nuclear units at Surry and North Anna.

The information that has been presented throughout this hearing demonstrates the completeness of our application and the staff's review, which shows that we have satisfied the standards for issuance of the COL.

We agree with the NRC staff's conclusion that its review has been adequate to support the required findings by the Atomic Energy Act, NRC

regulations and the National Environmental Policy Act for issuance of the COL. We look forward to the Commissioners' decisions.

CHAIRMAN SVINICKI: Thank you. I now invite the NRC staff to provide their closing statement.

MS. ORDAZ: Thank you, Chairman and Commissioners. For the record, my name is Vonna Ordaz. With me on this panel are Frank Akstulewicz and Anna Bradford.

Again, we thank you for the opportunity to speak today. Through its SECY paper supporting this mandatory hearing, its final safety evaluation report, its final supplemental Environmental Impact Statement and in our presentations today, we have provided an adequate basis for making the necessary findings set forth in 10 C.F.R. 52.97, and 10 C.F.R. 51.107, to support the issuance of the combined license for North Anna 3.

In this hearing, we have described why the staff's review of the North Anna 3 combined license application has been both thorough and complete. The review is appropriately focused by the finality afforded to issues within the scope of the ESBWR design certification. The staff has demonstrated the

completeness of our review in part through its reliance on staff guidance and interactions with the ACRS.

The ACRS agrees with the staff's conclusion that the combined license for North Anna 3 should be approved. Today, we highlighted certain aspects of our safety and environmental reviews. The safety panel highlighted the staff's site-specific seismic evaluation. During the staff's environmental panel, we highlighted our process for compliance with the NRC's National Environmental Policy Act regulations specified in 10 C.F.R. Part 51 and other applicable environmental statutes, and appropriate interactions with other government agencies and the public.

We are similarly confident that through the ITAAC process, the construction, reactor oversight process, inspections of construction activities, inspections of operational programs and the 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 license, the Atomic Energy Act and the Commission's regulations.

The applicant understands the necessity of

complying with requirements and also understands what needs to be done if any non-compliance is discovered, including determining the safety significance, determining operability, determining the extent of condition and taking appropriate and prompt corrective action to restore compliance.

I would note that the Commission raised a question for the staff during the course of the hearing, for which we said we'd provide additional information on for the record. We'll provide the supplemental response in accordance with the Commission's schedule order.

The staff appreciates the opportunity to present to the Commission today the results of our thorough and complete review. I would also like to personally thank each of the agency staff members and their supervisors that contributed to the North Anna 3 COLA.

Since I arrived in NRO almost a year ago, I've been continually impressed with the caliber of the technical experts, program managers in NRO and their commitment to excellence, and also with our partners across the agency.

I would also like to thank Dominion again for their professionalism with our staff over the

years, and we expect to continue our interactions with Dominion as they submit license amendment requests in the future to maintain their license in the coming years. This concludes the staff's presentation. Thank you.

CHAIRMAN SVINICKI: Thank you. Before I recognize my colleagues for any closing remarks, I would turn each of them and ask them if they have further questions that they would like to direct to any of the witnesses?

COMMISSIONER BURNS: No, none for me.

CHAIRMAN SVINICKI: Hearing none, I will recognize first for closing comments Commissioner Baran.

COMMISSIONER BARAN: Well thank you. I just want to thank the NRC staff again and all of today's participants for your hard work throughout the review of this application. Your thorough preparation for today's hearing was apparent and is appreciated, so thank you.

CHAIRMAN SVINICKI: Thank you. Commissioner Burns.

COMMISSIONER BURNS: I'll echo the comments of my colleague, and I appreciate the effort, both of the staff but also the applicant, Dominion.

Everything that went into this preparing, and believe me I know very well that most of the preparation, most of the hard work was not done in this room.

It was done in the preparation you did in terms of submitting the application and answering questions, the staff evaluating those answers, evaluating the application and undertaking the environmental review, so I appreciate that.

I think also to the applicant, I appreciate the coordination and cooperation that you have with DTE Electric, particularly as we consider this application as one of two applications to come in front of us that reference the ESBWR, and I think that kind of cooperation does the industry -- puts the industry in good stead and also standardization across the fleet as an objective.

Again, my thanks for appearing here today and answering our questions and for your testimony and work that went on before today. Thank you.

CHAIRMAN SVINICKI: Well, thank you. Let me make it unanimous on behalf of the Commission and add my thanks first to the applicant for the very rigorous and professional defense of the application over the course of the review, and to the NRC staff who presented here today and all who supported getting

to today.

As I sometimes remark in these mandatory hearings, if the public were to view this as the sum total, they might leave with a little bit of a curious view at the high level look. The truth is, and I know my colleagues the same as I, we look at the responses to the prehearing questions and the abundance of information in the written record that leads up to the mandatory hearing, that if approved will lead to issuance of the license should that be authorized going forward.

There is -- you need not look at the entirety of that record, even if you look at it on a sampling basis. The searching and exhaustive analysis and examination of issues is evident even if you just go in and do a sampling of various issue areas. So this to anyone who thinks that this was the sum total of our interest in this licensing matter, it is not and they are welcome to review the available record, if they care to validate that.

I also want to specifically thank the NRC, the arms of the NRC that support the Commission in conducting this mandatory hearing, the Office of Commission Appellate Adjudication, the Office of the Secretary of the Commission, and again as was noted by

Vonna, the many, many administrative professionals throughout the agency, without whose logistical support it would not be possible to move all the paper information technology that we have to move to get to conduct this hearing today.

So in closing, and for the information of the parties, the deadline for responses to any post-hearing questions will be April 6th, 2017 unless the Commission directs otherwise. The Secretary plans to issue an order with post-hearing questions by March 30th. The deadline for transcript corrections will be April 4th, and the Secretary plans to issue an order requesting proposed transcript corrections by March 28th.

As I mentioned this morning, the Commission expects to issue a final decision promptly, with due regard to the complexity of the issues and with that, the hearing is adjourned. Thank you.

(Whereupon, the above-entitled matter went off the record at 2:08 p.m.)

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
DOMINION VIRGINIA POWER	)	
	)	Docket No. 52-017-COL
	)	
(North Anna Power Station, Unit 3)	)	
	)	
(Mandatory Hearing)	)	

CERTIFICATE OF SERVICE

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

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

Dated at Rockville, Maryland,
this 28th day of March, 2017