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Subject: [External_Sender] RE: NRC Staff Questions for Dominion Energy - North Anna ESP Renewal Approach re: Seismic Models and Methodologies & EPZ
Date: Tuesday, December 2, 2025 12:57:54 PM
Attachments: image001.png

Hi India,

I thought it may be easier for you if I simply emailed out prepared responses for the public meeting. You will find them below in **red**. Considering that our evaluations are ongoing and the application is in development, there is not currently much more to share. My expectation is that our responses in the public meeting would also be appropriately limited, considering the ongoing nature of the evaluations.

Please let me know if you need anything else or receive other Staff feedback.

Best,

- Ellery

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From: India Banks <India.Banks@nrc.gov>
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Cc: Victoria.Huckabay@nrc.gov [EXTERNAL] <Victoria.Huckabay@nrc.gov>; DominionEnergy-ESPRenPUBLICem.Resource@nrc.gov; [Mahmoud -MJ- Jardaneh](mailto:Mahmoud.MJ.Jardaneh@nrc.gov) <Mahmoud.Jardaneh@nrc.gov>
Subject: [EXTERNAL] NRC Staff Questions for Dominion Energy - North Anna ESP Renewal Approach re: Seismic Models and Methodologies & EPZ

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Hello Ellery,

In preparation for the future public meeting with Dominion Energy, the staff have prepared the following questions. The staff looks forward to discussing the **highlighted** questions below.

Context for Questions:

The NRC staff held a public meeting on May 23, 2025, with Dominion Energy to discuss the draft white paper describing its North Anna early site permit (ESP) renewal approach (ML25163A114). Following the meeting, the staff had additional questions about Dominion's ESP renewal approach. On September 5, 2025, Dominion Energy submitted its final white paper (ML25248A265).

Q&A From External Hazards Branch

NRC Staff Initial Question:

The NRC staff seeks clarification from Dominion Energy regarding its plans to update seismic hazard characterization methods and develop new ground motion response spectra (GMRS) for the North Anna site.

Since NRC approval of the North Anna ESP application in 2007, many seismic models and methodologies have been developed and accepted by both the NRC and the industry as consensus to use for hazard characterization.

Recent seismic hazard characterizations of the North Anna site are:

1. Near-Term Task Force (NTTF) Recommendation 2.1 2014 (ML14092A416) and 2018 (ML18093A445) reevaluations
2. Process for the Ongoing Assessment of Natural Hazard Information (POANHI) site-specific evaluation in 2023 (ML23214A194)

The most recent POANHI hazard characterization incorporates the seismic source model CEUS-~~SSC~~ NUREG 2115, ground motion model NGA-East, and latest site response methods, described in RIL 2021-15.

Dominion Energy Response:

We have a COL issued for Unit 3. That COL contains seismic spectra hazard characterizations found acceptable (via issuance of the License) for construction of Unit 3 at the North Anna site. The COL was issued in 2017 in full light of the Post-Fukushima NTTF efforts associated with the documents referenced in your email below.

We find it appropriate to leverage the COL seismic information (spectra, methodologies, etc) for renewal of the ESP.

More recent regulations and guidelines for seismic hazard analysis have been reviewed and, while new, are not anticipated to have a significant impact. Additional information on that review and impact analysis will be provided in greater detail in our ESP renewal application.

NRC Staff Follow-up Question:

The NRC staff seeks clarity from Dominion Energy regarding its intent to use the 2017 COLA hazard model characterization for their ESP license renewal. The staff would like to know if Dominion plans to address the following topics in its ESP renewal application.

1. NGA-East ground motion model (GMM) has since superseded the older EPRI GMM.
Clarify whether Dominion plans to evaluate the impact of NGA-East to the North Anna site.
2. Clarify if Dominion plans to evaluate whether Repeated Large Magnitude Earthquakes (RLMEs) similar to Central Virginia Seismic Zone (CVSZ) developed by USGS will be implemented for an updated hazard characterization for the North Anna site.
3. Clarify if Dominion plans to evaluate whether Central and Eastern United States Seismic Source Characterization (CEUS-SSC) regional earthquake catalog recurrence rates are still suitable for the time period, from 2012 to present
4. Clarify if Dominion plans to evaluate whether updated site response analysis methods documented in RIL-2021-15 would have an impact on the site hazard.

Response:

As applicable to this request, the following studies have been performed to date for the site:

- ESP (2007)
- COL (2017)
- NTF 2.1 (2014), SPRA update (2018) – NUREG/KM 0017 (2018) and
- NGA East & Updated SRA (2023)

The most recent study, published in 2023, is believed to substantially address the items listed in the above request. These include:

- NGA-East Ground Motion Models
- Repeated Large Magnitude Earthquakes (RLMEs) through 2023
- Central and Eastern United States Seismic Source Characterization (CEUS-SSC) regional earthquake catalog recurrence rates up to 2023
- Site response analysis methods as documented in RIL-2021-15

Accordingly, Dominion has adopted an approach to renew the ESP by incorporating the recent studies above.

Q&A From Emergency Preparedness Branch

NRC Staff Question:

Background:

The NRC staff seeks clarification on Section 4.2, Part 5A: “Emergency Plan (Site Boundary EPZ)” of the North Anna ESP renewal approach final white paper. The NRC staff previously approved ESP-003 that established a 10-mile Emergency Planning Zone (EPZ) with requirements under 10 CFR 50.47(b) and Appendix E. In the final white paper, an Emergency Plan (EPlan) utilizing a site-boundary EPZ is mentioned, this deviates from the previously approved ESP and therefore would require NRC staff to conduct a detailed review. In order for the NRC staff to conduct its review, the NRC staff seeks clarification regarding which licensing framework (50.47/App. E or 50.160) Dominion intends to use for submitting its EPlan.

Impact:

This determination of the regulatory framework is critical because the path chosen directly impacts the content of the application as well as how the NRC would conduct its review of an EPlan to support issuance of an ESP. The white paper describes the use of a site boundary for an EPZ. The content of information required by an applicant under 10 CFR 50.47(b) and Appendix E is different from those described in 50.160. For instance, pursuing a site-boundary EPZ under the requirements of 50.47 and App. E would require an applicant to identify specific exemptions, provide the technical basis including source term, boundary dose, and protective action strategy, and justify why no offsite protective actions are necessary. Similarly, pursuing a site-boundary EPZ under 10 CFR 50.160, an applicant would need to provide, the technical basis that demonstrates that no protective actions are required offsite and must be supported by performance objectives and metrics.

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Response:

The white paper erroneously included the parenthetical “(Site Boundary EPZ)” as shown

- in the header for Part 5A,
- in the part title for Part 5A,
- and in the table of contents for the application as shown in section 4.2.

It is Dominion’s intent that the description of the EP that would be shown in the ESP renewal application would closely reflect the information previously approved in ESP-003 by the NRC, which established a 10-mile EPZ per the requirements under 10 CFR 50.47(b) and Appendix E. Dominion does NOT intend to change the EPZ to the site boundary in the ESP renewal application as described in 10 CFR 50.160.

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Thank you,

INDIA BANKS

PROJECT MANAGER

U.S. NUCLEAR REGULATORY COMMISSION

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