

# Evaluation of Seismic Risk for VC Summer Under the Process for Ongoing Assessment of Natural Hazard Information (POANHl)

January 25, 2024

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- Purpose:

- Present to Dominion staff the methodologies and assumptions used in the NRC staff's evaluation of preliminary seismic risk estimate for VC Summer based on the site-specific POANHI hazard

- Objective:

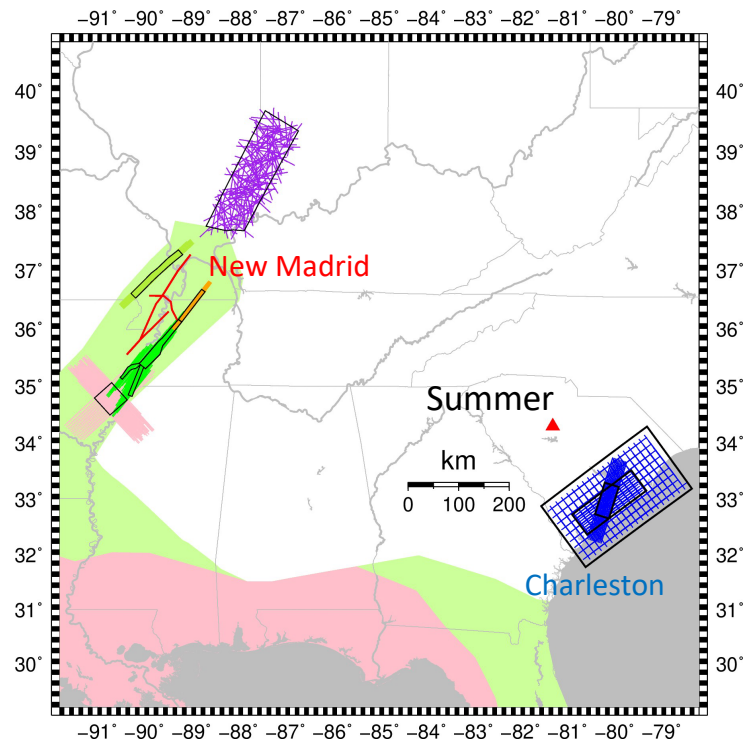
- Provide Dominion staff with the option to offer additional information for the NRC staff to refine its analysis and support its decision

# Key Messages

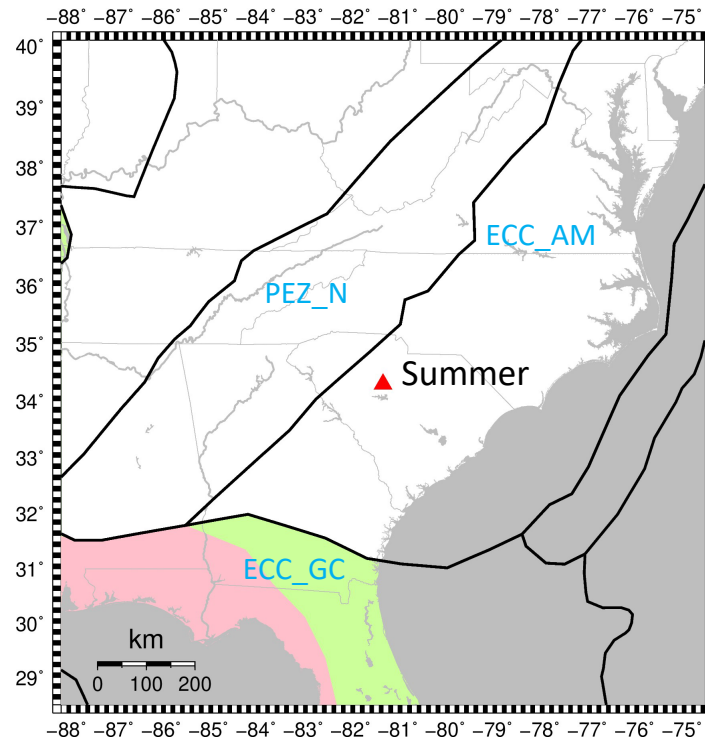
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- The staff's evaluation has not identified an immediate safety concern; VC Summer continues to operate safely
- Site-specific POANHI seismic evaluation indicates a need for further refinements to the NRC staff evaluation
- NRC staff's review may benefit from additional plant-specific modeling details and insights that Dominion could provide

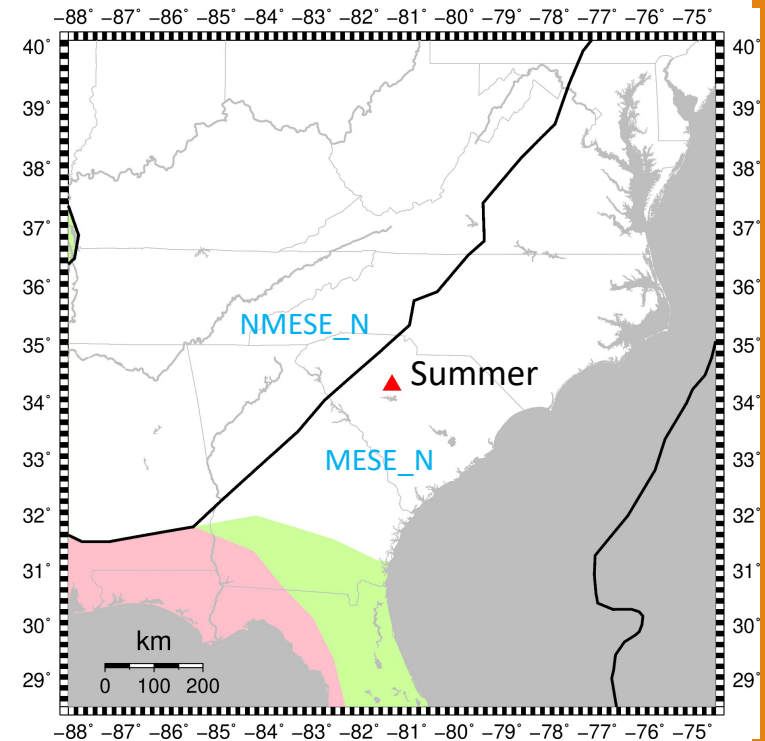
# Central and Eastern U.S. Seismic Source Model (NUREG 2115)



Repeating Large  
Magnitude Earthquakes



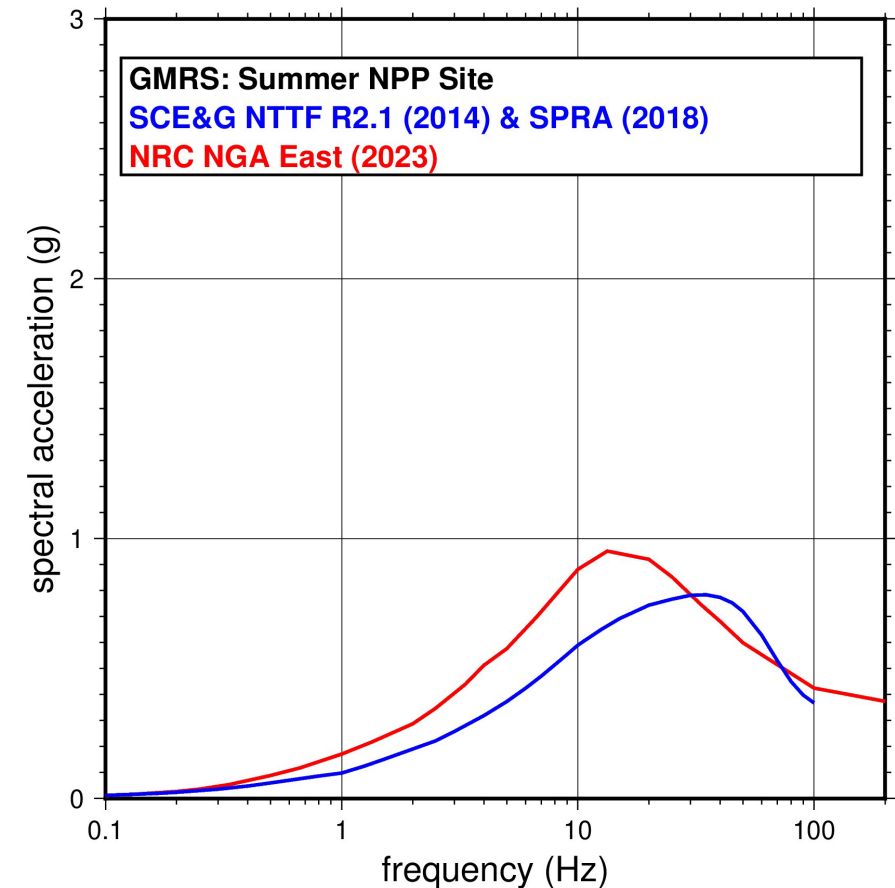
Seismotectonic Zones



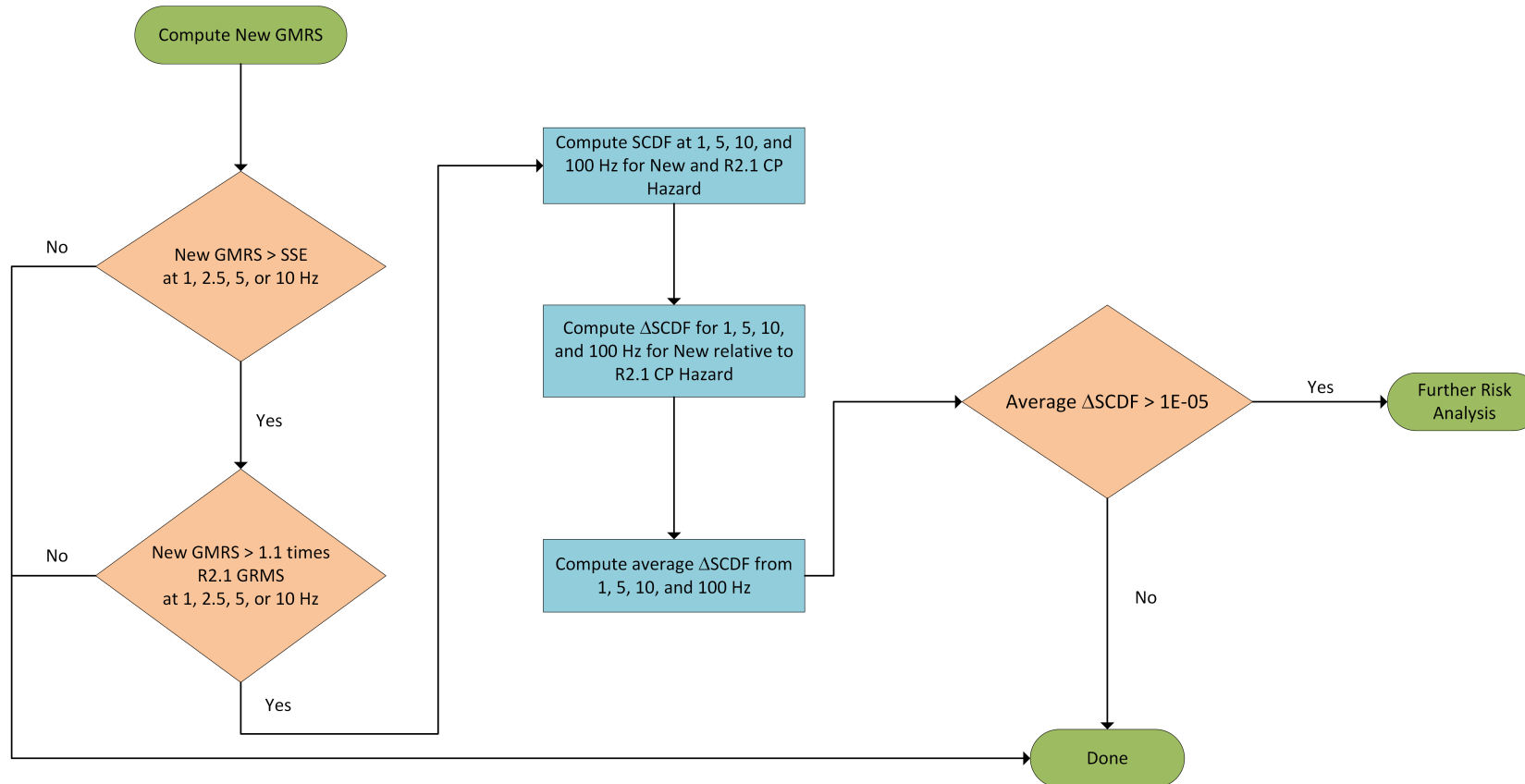
Mmax Zones

# POANHI Seismic Hazard

- Figure shows ground motion response spectra (GMRS) from NRC staff's recent evaluation (**red**) compared to previous evaluations resulting from Near Term Task Force Recommendation 2.1 (**blue**)
- NRC staff's recent evaluation developed used latest models
  - NGA-East ground motion model
  - Central and Eastern U.S. seismic source model (NUREG 2115) including update to seismicity catalog to remove dependent events and reservoir induced earthquakes in South Carolina
  - Because Summer is a hard-rock site NRC staff's evaluation did not implement a site response analysis



# POANH I Decision-Making Flowchart



# Seismic Risk Using POANHI Hazard - Approach

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- Used latest information available to NRC staff to obtain plant-level seismic risk evaluation.
  - Approach was consistent with approach discussed in public meetings.
  - Dominion may be able to provide more realistic modeling assumptions
- Used average of 1, 5, 10, and 100 Hz results consistent with approach in flowchart and discussions in public meetings.
- NRC staff consideration of reasonable variations in plant parameters yielded similar results

# Insights from Licensee's SPRA

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- The dominant initiator for SCDF (potential core damage) was seismically induced loss of offsite power.
- Dominant risk contributors for SCDF include:
  - Relay chatter
  - Operator action to continue auxiliary feedwater after battery depletion (if station loses all AC power).
  - Operator action to manually start (safety systems)ESFAS after failure of automatic ESFAS.
- Licensee's sensitivity analysis demonstrated reduction in SCDF from credit for operator actions to reset relays.
- No quantitative credit for FLEX equipment or actions in the SPRA.



# NRC Staff Evaluation of Insights from Licensee's SPRA

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- Seismically induced loss of offsite power expected to remain dominant initiator for SCDF.
- Changes in dominant risk contributors are likely due to POANHI hazard in 1 – 10 Hertz (Hz) and high frequency (>33 Hz) range.
  - Increase in 1 – 10 Hz range for updated POANHI hazard can increase relative importance of contributors besides loss of offsite power.
  - Decrease in >33 Hz range for updated POANHI hazard can decrease relative importance of relay chatter failures.
- Impact of operator actions to reset relays and FLEX credit hazard on risk reduction is unknown based on information available to the NRC staff.

# Path Forward

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- NRC staff analysis and decision will benefit from improved realism that could be provided by the licensee
- Licensee has no response obligations, but NRC staff will consider any additional information provided