

North Anna

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# **Dominion Virginia Power Mandatory Hearing on Combined License for North Anna Power Station, Unit 3**

## **Overview Panel**

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# Dominion Virginia Power - Profile

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- Serves **2.6 million** customers in NC and VA
- **~21,665 MWe** of generation capacity
- **~\$7.6 billion** in operating revenues



# Dominion Resources



- **Dominion Resources**, headquartered in Richmond, VA, is one of the nation's largest producers and transporters of energy, with a portfolio of approximately:
  - **26,400 MWe** of electricity generation
  - **6,600 miles** of electric transmission lines
  - **57,600 miles** of electric distribution lines
  - **14,900 miles** of natural gas transmission
- Dominion serves over **6 million** utility and retail energy customers with approximately **1 trillion** cubic feet of gas storage space.
- Dominion has **~\$71 billion** in total assets

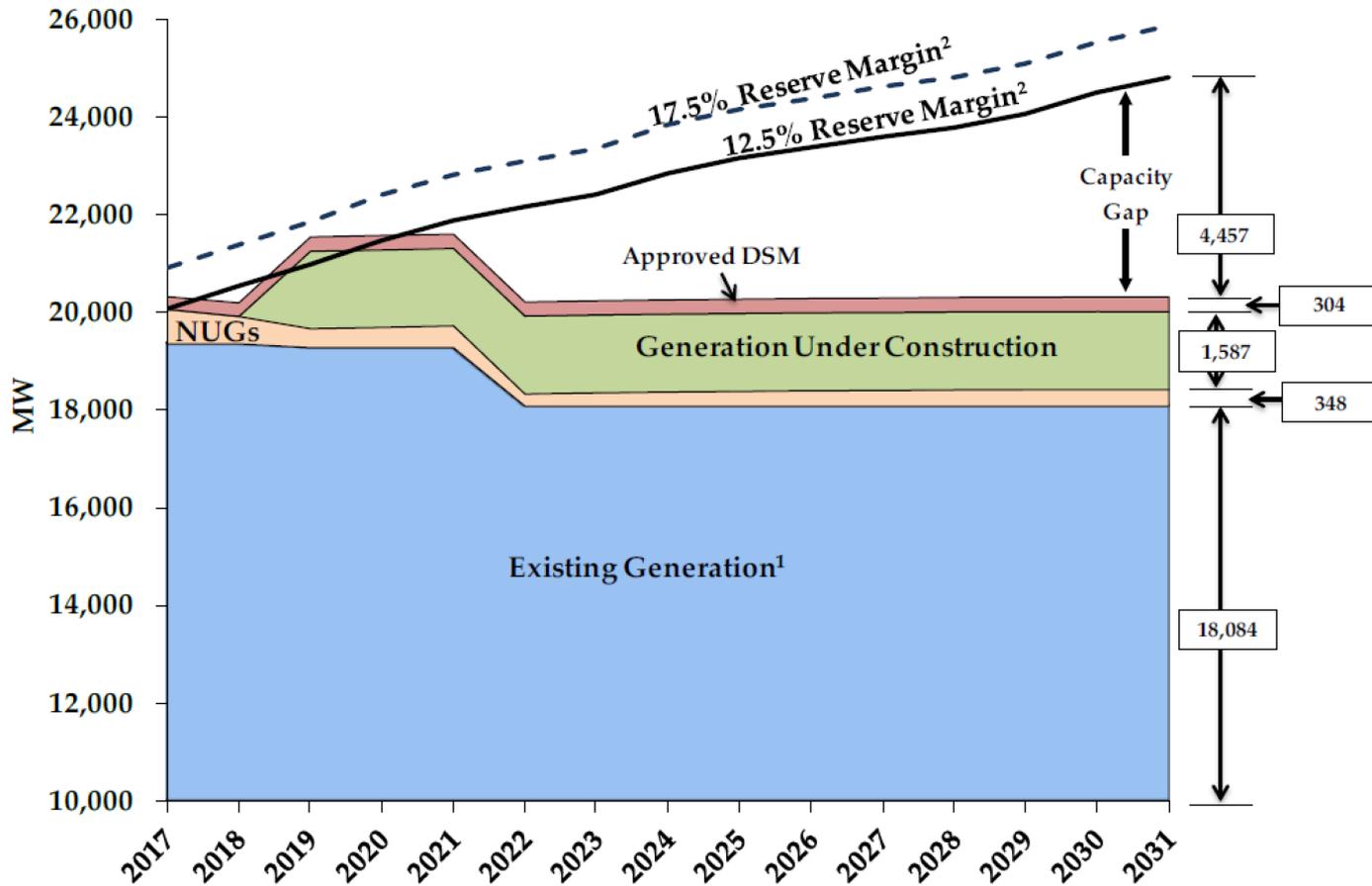
# Strong Nuclear Experience

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- Dominion has about 50 years of experience in the design, construction, and operation of nuclear generating stations
  - Dominion operates two units at Surry Power Station, two units at North Anna Power Station, and an affiliate operates two units at Millstone Power Station. Another affiliate unit, Kewaunee Power Station, recently ceased operations
  - Dominion is supported by a strong, cohesive corporate nuclear organization
- Dominion's nuclear performance has been exemplary

# Continuing Need for Power Exists

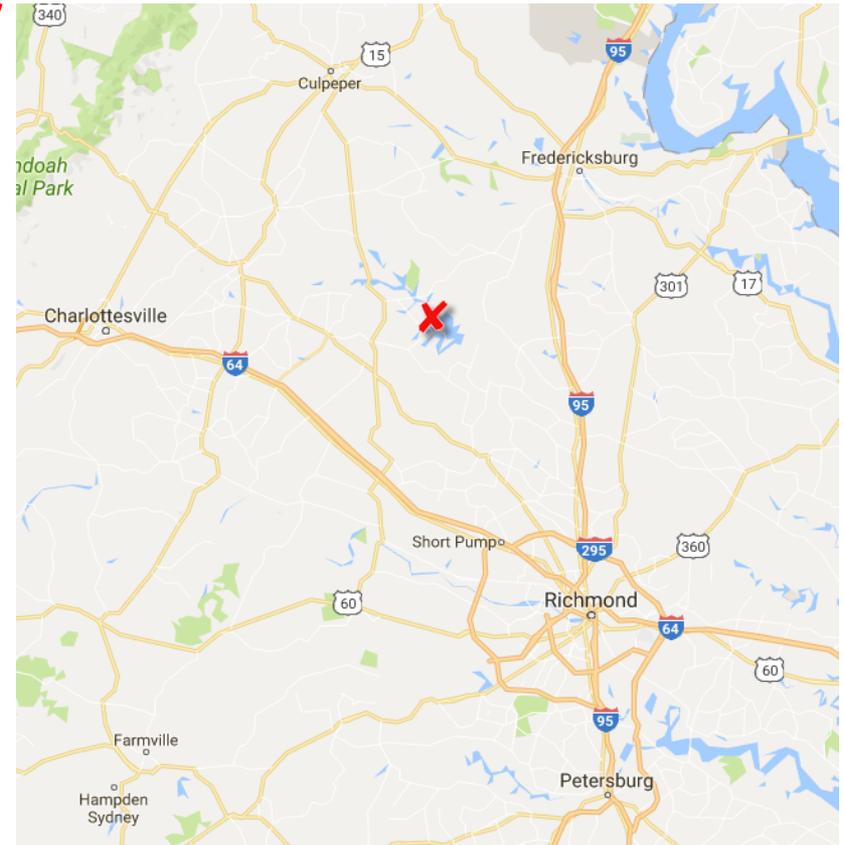
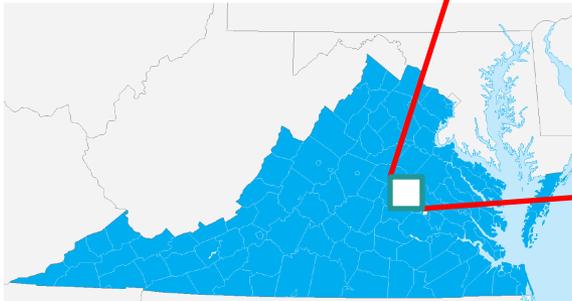
Figure 1.3.1 - Current Company Capacity Position (2017 – 2031)



Source: 2016 IRP

# North Anna Site Location

- The North Anna site is located on Lake Anna in central Virginia
- The existing site supports two operating units and an ISFSI



# Existing Site with Unit 3 Shown

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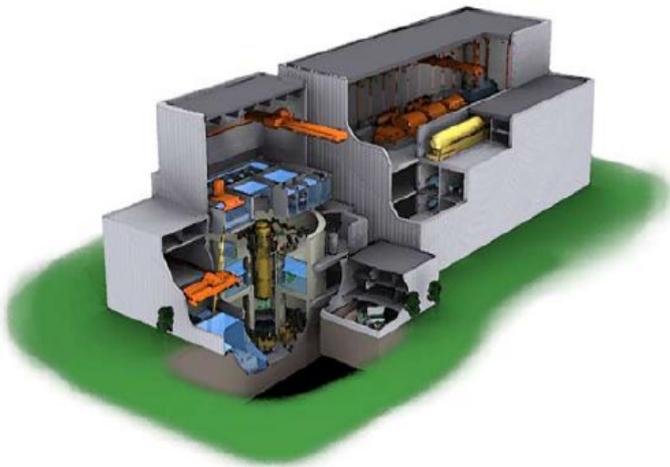


# ESBWR Technology Selected

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## ESBWR Certified Design

Final rule in 10 CFR Part 52, Appendix E,  
published in November 2014



## ESBWR Evolutionary Design Features

- Passive Safety Design – Safety systems require no AC power to actuate or operate for at least 72 hours
- Natural Circulation Core and Containment Cooling Systems
- Robust Seismic Design Envelope
- No site-specific Seismic Category I safety-related structures
- Simplicity – Significantly fewer systems and components than previous designs promotes ease of operation and maintenance
- Safety – Low Core Damage Frequency (CDF)
- Security – Main Control Room and Spent Fuel Pool are located below grade.

# North Anna Unit 3 COLA

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- Combined License Application (COLA) for one ESBWR unit was submitted in November 2007
- Referenced the Early Site Permit (ESP) issued in November 2007 for the North Anna site
  - The ESP addressed site safety issues, environmental impacts, and elements of emergency preparedness
- The COLA incorporated the Design Control Document for the ESBWR certified design
- Followed a design-centered review licensing approach to maximize standardization
  - Standard COLA content generally followed Fermi 3

# Conformance with NRC Guidance

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- The COLA was prepared following NRC safety and process requirements and guidance
  - **NUREG-0800** “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants”
  - **NUREG-1555** “Standard Review Plans for Environmental Reviews for Nuclear Power Plants”
  - **Regulatory Guide 1.206** “Combined License Applications for Nuclear Power Plants”
  - **Regulatory Issue Summary 2006-06** “New Reactor Standardization Needed to Support the Design-Centered Licensing Review Approach”

# Standardization Maximized

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Category	General Description
Departure and Exemption	Additional seismic analysis required because Unit 3 site response spectra exceeds CSDRS
Departure and Exemption	Due to space limitations, added an intermediate switchyard to house main generator circuit breaker and disconnects
Departure	Justified acceptability of installed surge protection at existing North Anna switchyard
Departure (Identical to R-COLA)	Expansion of temporary radwaste storage
Exemption (Identical to R-COLA)	Applicable regulations for material control and accounting
Departure and Exemption	Liquid radwaste discharge piping location
Departure and Exemption	SSC design criteria for hurricane missiles that exceed DCD assumptions

# Variations from ESP

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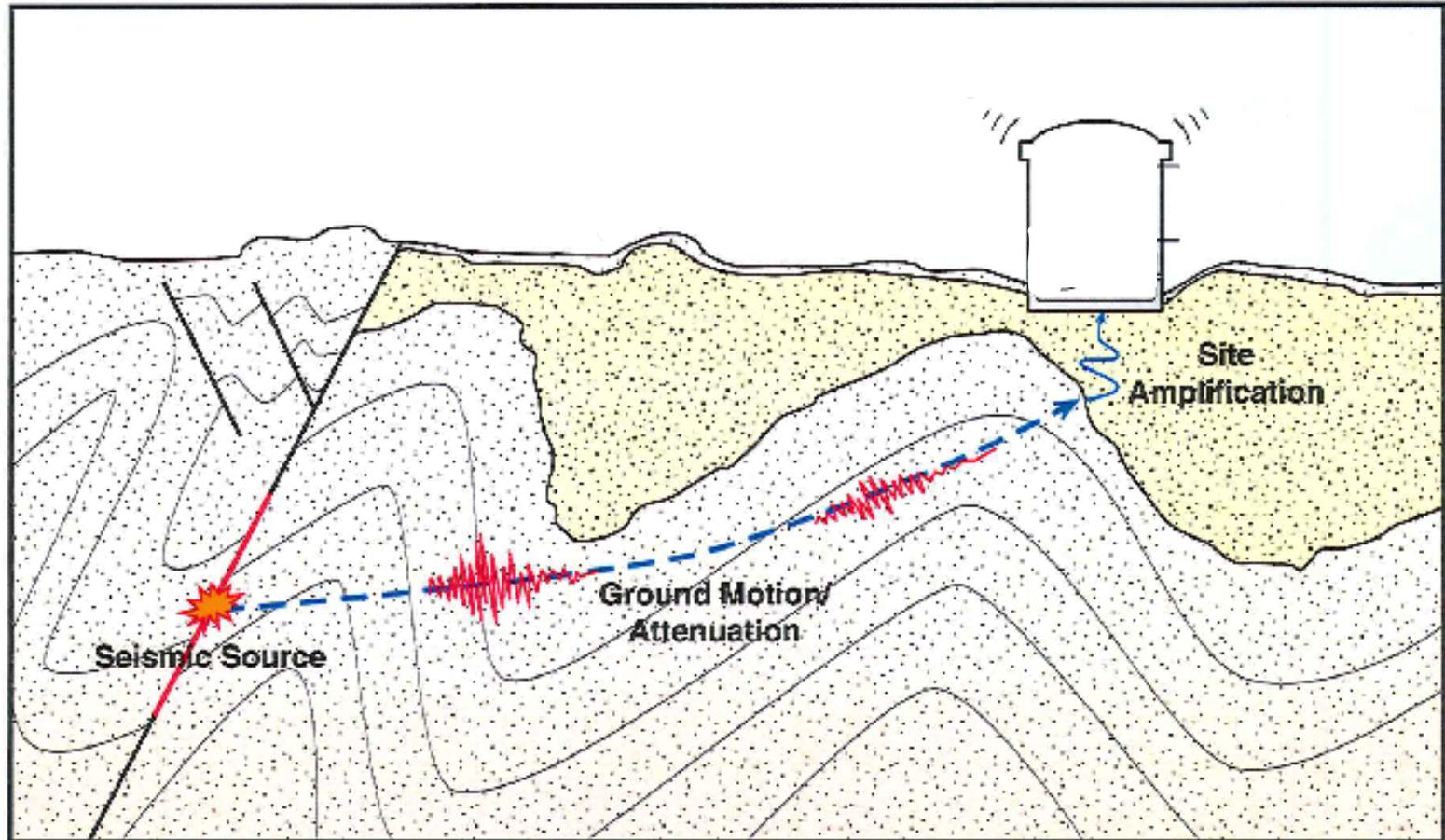
- A total of 18 variations from specific ESP content were identified, including:
  - Variations relating to reevaluation of seismic hazards
  - Variations relating to the change in lake level
  - Variation conforming the source term to the ESBWR
  - Variations due to changes in various dose parameters based on new data (changes in receptor locations, dispersion estimates, etc.)
  - Variations due to changes in groundwater travel parameters based on new data (soil parameters)
  - Variation in tornado characteristics based on using latest NRC guidance

# Fukushima NTTF Recommendations

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- ESBWR passive design addressed all but three of the applicable Fukushima Near-Term Task Force (NTTF) recommendations
- Those three recommendations were addressed in the COLA through proposed license conditions:
  - At least one year prior to completion of the last ITAAC, develop an overall mitigating strategies plan for BDB external events (**NTTF Item 4.2**)
  - Prior to fuel load, ensure that the operator training program includes training on Spent Fuel Pool water level instrumentation power supplies (**NTTF Item 7.1**)
  - No later than 18 months before completing ITAAC, perform an assessment of Emergency Planning staffing and communications and complete corrective actions no later than 180 days prior to fuel load (**NTTF Item 9.3**)
- The three license conditions are the same as the R-COL's

# Seismic Analyses



Graphic Source: SIGMA Project Plan

# Seismic Analyses (cont.)

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- Used new CEUS-SSC model (NUREG-2115)
- Updated the model's catalog through December 2011 to include the Mineral, VA earthquake
- Used updated EPRI Ground Motion Model
- Used the methodology specified in the DCD to perform the site-specific seismic analyses
- Used the latest regulatory guidance to perform the seismic analyses

# Environmental Review

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- Most environmental issues were resolved in the Final Environmental Impact Statement prepared for the ESP (NUREG-1811)
- Environmental issues not resolved in the ESP proceeding were addressed in the COLA ER and resolved in the NRC's Supplemental EIS (NUREG-1917)
- Monitored for new and significant information

# Environmental Permits for COL

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- Virginia Water Protection Permits (401 Certification) – April 2011 & April 2012
- Coastal Zone Management Act Consistency Determination – May 2011
- Required consultations completed