



Early Site Permit (ESP) Application Review Clinch River Nuclear Site

Overview Panel
August 14, 2019

Panelists

- Fred Brown – Director, Office of New Reactors
- Anna Bradford – Deputy Director, Division of Licensing, Siting and Environmental Analyses

Overview of Staff's Review of the Early Site Permit Application

- Summary of Early Site Permit Application (ESPA)
- Overview – Safety Review
- Summary of Safety Findings
- Overview – Environmental Review
- Summary of Environmental Findings
- Overview of Panel Presentations

Clinch River ESPA

- In May 2016, Tennessee Valley Authority (TVA) submitted the ESP application
- In December 2016, application accepted for docketing and detailed technical review

Clinch River ESPA (cont.)

- TVA's request:
 - Permit approval for a 20-year term
 - Approval for a plume exposure pathway (PEP) emergency planning zone (EPZ) sizing methodology
 - 2 major features (onsite) Emergency Plans and exemption requests for site boundary and 2-mile PEP EPZs
- ESPA does not establish a PEP EPZ

Clinch River ESPA (cont.)

- If the ESP is issued, the NRC would be approving the Clinch River Nuclear Site as a suitable site for the potential construction and operation of two or more small modular reactor (SMRs)
- An ESP does not authorize construction or operation

Clinch River ESPA Safety Review

- Site Safety Evaluation
 - Characteristics of the proposed site
 - Plant Parameter Envelope (PPE)
 - Major features emergency plans
 - PEP EPZ size methodology for use by combined license (COL) or construction permit (CP) applicant

Clinch River ESPA (cont.)

- TVA has not chosen a specific reactor design for the site
 - A PPE can bound a variety of technologies
 - TVA PPE based on four SMR designs
 - TVA PPE for site based on two or more SMRs with a maximum capacity of 2420 MWt (800 MWe)

Clinch River ESPA Safety Review (cont.)

- In a COL or CP application, when a specific technology is identified
 - ESP PPE values are compared to those of the selected technology
 - If design characteristics of the selected technology exceed bounding ESP PPE values, additional reviews are conducted

Clinch River ESPA Safety Review (cont.)

- Advisory Committee on Reactor Safeguards (ACRS) Review under 10 CFR 52.23
 - Subcommittee – May 2018 to November 2018
 - Full Committee – December 2018
 - ACRS Report – January 2019
- FSER issued – June 2019

Required Findings

10 CFR 52.24(a)

1. Applicable standards and requirements of the Atomic Energy Act (AEA) and NRC regulations have been met
2. Required notifications have been duly made
3. Reasonable assurance that the site is in conformity with the provisions of the AEA and NRC regulations

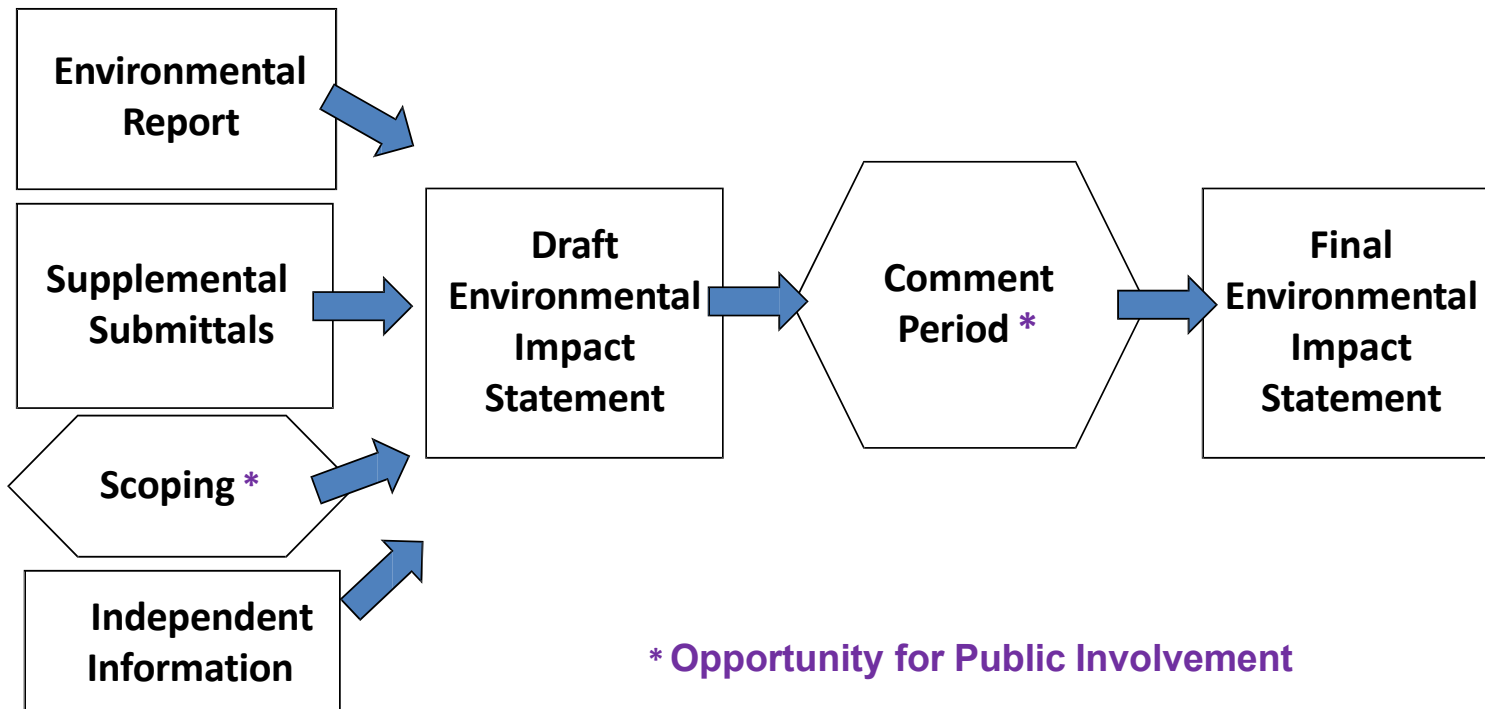
Required Findings (cont.)

4. Applicant is technically qualified to engage in the activities authorized
5. Issuance of the permit will not be inimical to the common defense and security or to the health and safety of the public
6. The findings required by Subpart A of 10 CFR Part 51 have been made

Environmental Review

- Evaluates impacts from the construction and operation of two or more SMRs at the proposed and alternate sites
- Review completed in accordance with the National Environmental Policy Act (NEPA) and 10 CFR Part 51
- US Army Corps of Engineers cooperated on EIS development

Environmental Review Process



Environmental Review

- Deferred issues that applicant chose not to address as allowed by regulation:
 - Cost/Benefit (Need for Power)
 - Energy Alternatives

Environmental Review

- Record of Decision:
 - States the decision
 - Identifies all alternatives considered
 - Discusses preferences among alternatives
 - States whether NRC has taken all practicable measures, within its jurisdiction, to avoid or minimize environmental harm

Environmental Review

10 CFR 51.105(a) Findings

1. Requirements of NEPA Section 102(2)(A), (C), and (E) and 10 CFR Part 51, Subpart A, have been met
2. After considering the final balance among conflicting factors in the record of the proceeding, the appropriate action is issuance of the ESP

Environmental Review Required Findings (cont.)

3. After weighing environmental, economic, technical, and other benefits against environmental and other costs, and after considering reasonable alternatives, the ESP should be issued
4. The staff's NEPA review has been adequate

Overview of Panel Presentations

Panel	Issues Discussed
Safety Panel	<ul style="list-style-type: none">• Overview of Safety Review• EPZ Size Methodology and Exemptions
Environmental Panel	<ul style="list-style-type: none">• Overview of Environmental Review

Abbreviations

- **ACRS – Advisory Committee on Reactor Safeguards**
- **AEA – Atomic Energy Act**
- **CFR – Code of Federal Regulations**
- **COL – Combined License**
- **CP – Construction Permit**
- **CRN – Clinch River Nuclear**

Abbreviations

- **EIS – Environmental Impact Statement**
- **EPZ – Emergency Planning Zone**
- **ESP – Early Site Permit**
- **ESPA – Early Site Permit Application**
- **FSER – Final Safety Evaluation Report**

Abbreviations

- **NEPA – National Environmental Policy Act**
- **NRC – Nuclear Regulatory Commission**
- **PEP – Plume Exposure Pathway**
- **PPE – Plant Parameter Envelope**
- **SMR – Small Modular Reactor**
- **TVA – Tennessee Valley Authority**