

Safety Panel

ESPA Emergency Preparedness Approach



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ESPA – Emergency Preparedness Approach

Emergency Planning Information – 3 Areas

- Emergency Plan
 - Two major features Emergency Plans
 - Part 5A – Site Boundary plume exposure pathway (PEP) emergency planning zone (EPZ) Emergency Plan
 - Part 5B – 2-Mile PEP EPZ Emergency Plan

- Exemptions and Departures
 - 2 sets of exemption requests in Part 6 – accompany the less than 10-mile EPZ emergency plans in Part 5
 - Exemption requests for a PEP EPZ at Site Boundary
 - Exemption requests for a 2-mile PEP EPZ

- PEP EPZ Sizing Methodology
 - Dose-Based, consequence-oriented and risk-informed approach
 - Reasonable assurance for adequate protection
 - Described in Part 2, SSAR, Section 13.3, *Emergency Preparedness*

The final EPZ size for the Clinch River Site will be determined in a future application

Part 5 – Emergency Plan

- TVA developed two distinct major features of an emergency plan.
- Each plan proposes major features under 10 CFR 50.47 and appendix E to Part 50, as required by 10 CFR 52.17(b)(2)(i) and addresses the 16 planning standards in NUREG–0654, Section II.
 - Part 5A – major features of an Emergency Plan for a PEP EPZ consisting of the area encompassed by the Site Boundary.
 - Part 5B –major features of an Emergency Plan for a PEP EPZ consisting of an area approximately two miles in radius surrounding the Clinch River Site.
- Letters of Support for the project from local counties and State

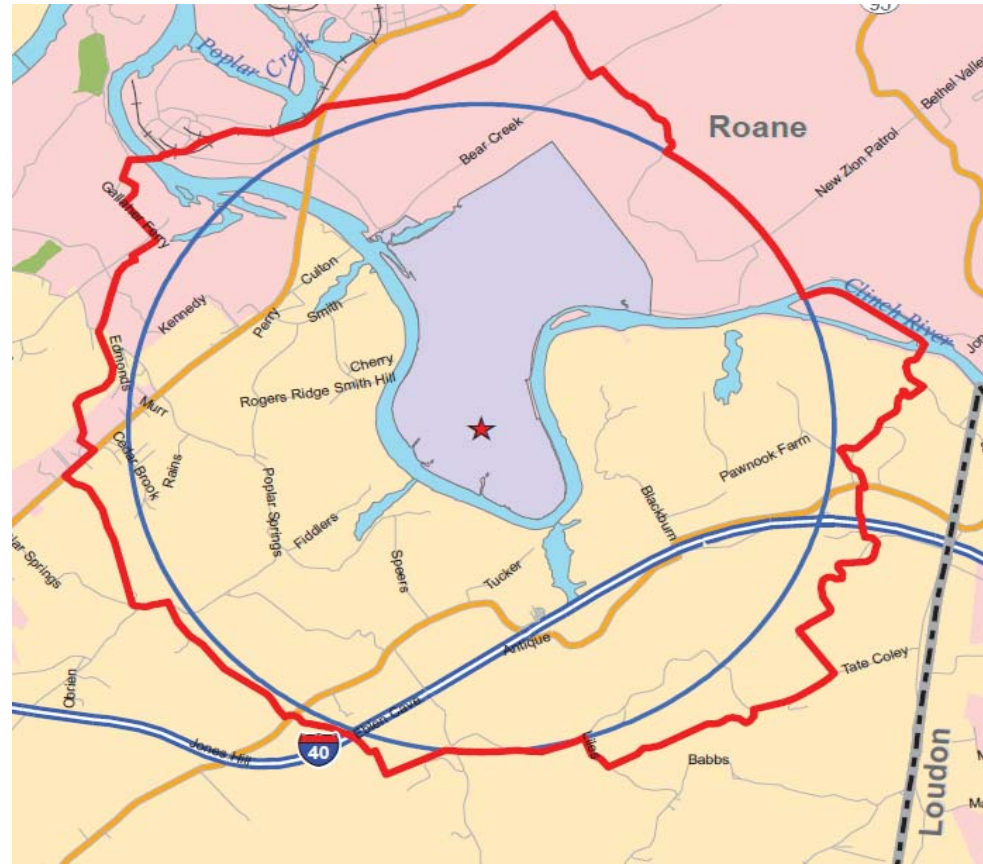
Part 5A – Emergency Plan (Site Boundary EPZ)



Part 5B – Emergency Plan (2-Mile EPZ)

Legend

- ★ Clinch River Site Center Point
- EPZ Boundary
- 2 mile radius
- ▭ County Boundary
- Tennessee State Parks
- Incorporated Areas
- Railroad
- Interstate
- Highway
- Major Road
- Local Road



Part 6 – Exemptions and Departures

Pursuant to 10 CFR 52.7, **Specific Exemptions**, which is governed by 10 CFR 50.12, **Specific Exemptions**, TVA requested exemptions from:

- 10 CFR 50.47(b) regarding onsite and offsite emergency response plans for nuclear power reactor
- 10 CFR 50.33(g) and 10 CFR 50.47(c)(2) to establish PEP EPZ for nuclear power plants
- 10 CFR Part 50, Appendix E, which establish the elements that make up the content of emergency plans

Two Sets of Exemptions

- Exemptions for an approximate **2-mile PEP EPZ**
 - Deviate from 10-mile PEP EPZ
- Exemptions for a PEP EPZ established at the **Site Boundary**
 - Deviate from 10-mile PEP EPZ
 - Various elements of a formal offsite emergency plan
 - Evacuation time estimates
 - Certain elements of offsite notifications and exercises

Part 2 – PEP EPZ Sizing Methodology

- SMR design and safety advancements
- Consistent with NUREG-0396 sizing rationale
 - Addresses a broad spectrum of accidents
 - Aligns with recommended dose criteria
 - Environmental Protection Agency (EPA) early-phase (Protection Action Guides) (PAGs) – 1 roentgen equivalent man (rem) total effective dose equivalent (TEDE)

Part 2 – PEP EPZ Sizing Methodology Technical Criteria

- **Criterion A – design basis accidents**
 - EPA early-phase PAG
- **Criterion B – less severe core melt accidents**
 - Core Damage Frequency (CDF) 1E-6 per reactor-year (rx-yr)
 - Intact containment
 - EPA early-phase PAG
- **Criterion C – more severe core melt accidents**
 - CDF 1E-7 per rx-yr
 - Containment bypass or failure
 - Sufficient size to provide Reduction in Early Severe Health Effects

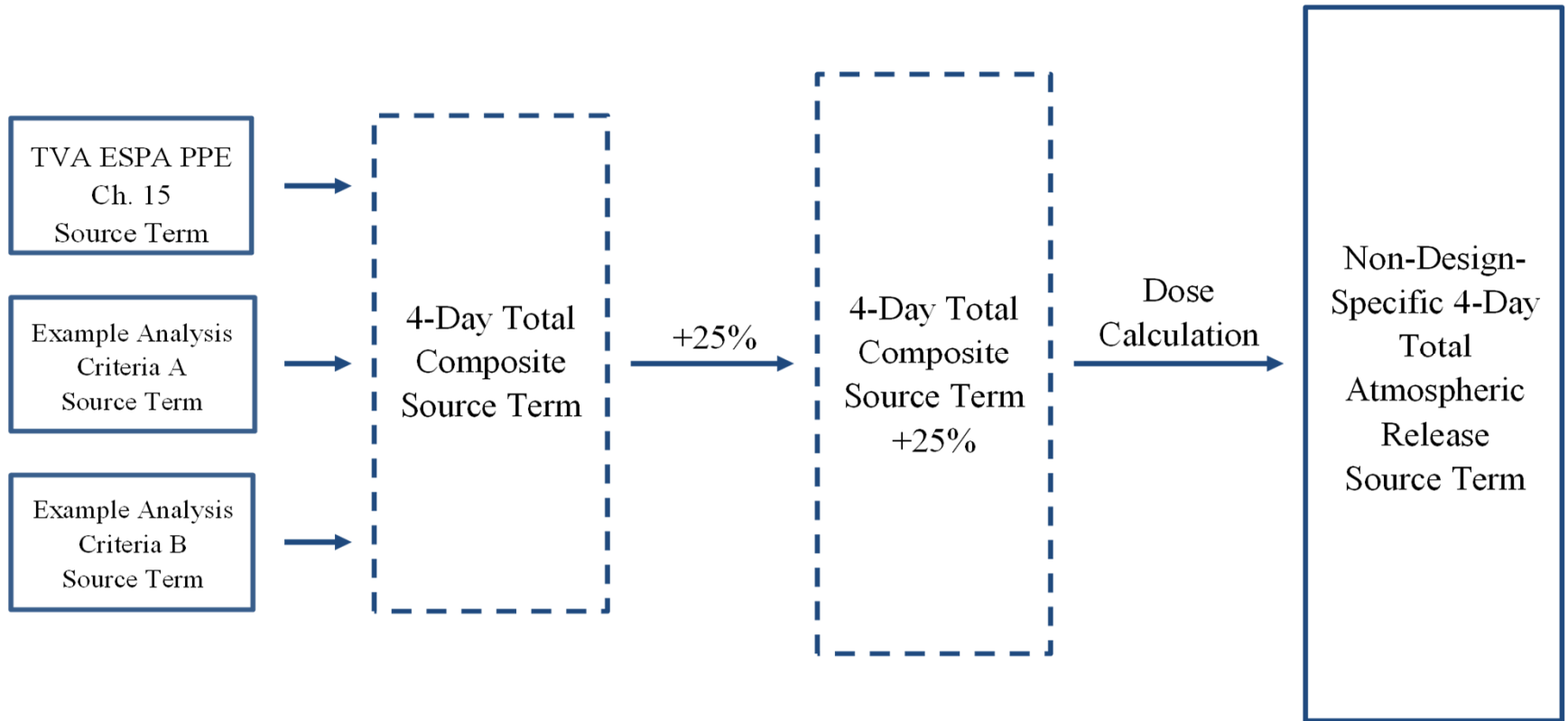
A future application would implement the EPZ size methodology,
with site- and design-specific input,
to determine the EPZ size for the Clinch River Site

Design-Specific Example Analysis

Evaluates NuScale Power Plant at Clinch River Site

Criteria	Site Boundary Dose TEDE (rem)	EPA Early Phase PAG Limit TEDE (rem)
A	0.104	1
B	0.158	1
C	No accident scenarios met the required screening criteria.	

Non-Design-Specific Plant Parameter



Summary – Emergency Preparedness Approach

Part 5 Emergency Plan

- Approval of the major features of the Site Boundary (Part 5A) and 2-mile emergency plan (Part 5B)
- A future application would describe a complete and integrated emergency plan

Part 6 Exemptions

- Primarily to deviate from the current 10-mile PEP EPZ size requirement based implementation of the dose-based, consequence-oriented methodology

Part 2 Plume Exposure Pathway EPZ Methodology

- Risk-informed, dose-based, consequence-oriented approach customized for SMR technology
- Approval to use the methodology for design and site specific implementation in a future application