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# Vogtle ESP Mandatory Hearing

March 23-25, 2009

## NRC Staff Presentation Topic #6

## Site Emergency Plan

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# Emergency Planning

## SER Section 13.3, "Emergency Planning" (EP)

- First complete Emergency Plan review under Part 52
- Complete & Integrated Emergency Plan
  - Early Site Permit (ESP) application
  - NRC reviews onsite emergency plan
    - Evacuation Time Estimate (ETE)
    - Inspections, Tests, Analyses, Acceptance Criteria (ITAAC)
  - FEMA reviews offsite (State & County) emergency plans
- 7 EP Permit Conditions
  - 6 - Emergency Action Level (EAL) scheme
  - 1 - Technical Support Center (TSC) location

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# Emergency Planning

- Emergency Planning Zones (EPZs)
  - 10-mile plume exposure pathway ("10-mile EPZ")
  - 50-mile ingestion control pathway ("50-mile EPZ")
- Onsite Emergency Plan
  - ESP Applicant (Southern Nuclear Operating Co./SNC)
  - Vogtle Electric Generating Plant (VEGP)
- Offsite Emergency Plans
  - State & County Governmental Agencies
    - Affected States (10-mi & 50-mi EPZs)
    - Risk Counties (10-mi EPZ)
  - Private support organizations (hospitals, ambulance, labs, etc.)
  - Federal agencies (e.g., NRC, FEMA, DOE, EPA, DOA)

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# Emergency Plans

- VEGP Emergency Plan (onsite)
  - Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC)
  - Evacuation Time Estimate (ETE)
- Georgia Emergency Response Plan
  - Burke County Plan
- South Carolina Emergency Response Plan
  - Barnwell County Plan
  - Allendale County Plan
  - Aiken County Plan
- Dept. of Energy (DOE), Savannah River Site (S. Carolina)
  - Memorandum Of Agreement (DOE-Southern)

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# Key Elements

## 10 CFR 50.47(b), NUREG-0654/FEMA-REP-1

- Planning Standards & Evaluation Criteria
  1) Assignment of Responsibility (Organization Control)
  2) Onsite Emergency Organization
  3) Emergency Response Support & Resources
  4) Emergency Classification System
  5) Notification Methods & Procedures
  6) Emergency Communications
  7) Public Education & Information
  8) Emergency Facilities & Equipment

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# Key Elements (cont.)

- Planning Standards & Evaluation Criteria
  9) Accident Assessment
  10) Protective Response
  11) Radiological Exposure Control
  12) Medical & Public Health Support
  13) Recovery & Reentry (Post-Accident Operations)
  14) Exercises & Drills
  15) Radiological Emergency Response Training
  16) Responsibility for Planning Effort (Emergency Plans)

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# Standard of Review
## (10 CFR 50.47(a))

- NRC (onsite plan)
  - Whether the applicant's onsite emergency plans are adequate, and whether there is reasonable assurance that they can be implemented.
- FEMA (offsite plans)
  - Whether State and local emergency plans are adequate, and whether there is reasonable assurance that they can be implemented.
- NRC (complete & integrated emergency plan)
  - There is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency.

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# Emergency Response Facilities

- Onsite (VEGP site)
  - Control Room (direct operational control)
  - Technical Support Center (TSC)
  - Operational Support Center (OSC)
- Offsite (County/State/Federal)
  - Emergency Operations Facility (EOF)
  - State & County EOCs (govm't & private entities)
  - NRC's Atlanta Office & Headquarters
  - Other Federal agencies

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# Multi-Unit Site (Units 1-4)

## Common Emergency Planning Features

- Onsite Emergency Plan (VEGP)
  - (existing) Units 1 & 2 – Annex V1
  - (ESP proposed) Units 3 & 4 – Annex V2
- Offsite Emergency Plans (State/County)
- Technical Support Center (TSC)
- Emergency Operations Facility (EOF)
- Emergency Planning Zones (EPZs)
  - 10-mile & 50-mile EPZs
- Evacuation Time Estimate (ETE) (10-mile EPZ)

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# Evacuation Time Estimate (ETE)

- Supports Protective Action Recommendations
  - Sheltering in place (home, work, school, etc.)
  - Evacuation
- Applies to the entire site (all 4 Units)
- ETE examines the 10-mi EPZ
  - 13 Protective Action Zones (PAZs)
  - Plant Vogtle – Emergency Information Calendar
- ETE was updated in April 2006 (IEM, Inc.)
  - Time to evac. entire 10-mi EPZ ~100-115 mins.
- NRC reviewed ETE (with contractor support)

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# (EP) Permit Conditions

- Reflect details that cannot be known at the ESP stage
- Emergency Action Levels (EALs)
  - 2 & 3 – EALs reflect Nuclear Energy Institute (NEI) 07-01
    - NRC ongoing endorsement review of NEI 07-01
    - RG 1.101 will endorse NEI 07-01, if approved (ITAAC 1.1.2)
  - 4 & 5 – EALs reflect AP1000 DCD Amendments
    - NRC rulemaking for certified design amendments
    - EALs potentially affected by design changes in DCD amendments
  - 6 & 7 – Fully developed set of EALs
    - Reflects Section IV.B of Appendix E to 10 CFR Part 50
    - EALs based on the as-built plant conditions & instrumentation
    - State/local agencies review & agreement
- Technical Support Center (TSC)
  - 8 – TSC location (AP1000 DCD, Tier 2* amendment)

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# Technical Support Center (TSC)

- Technical & management support to Control Rm.
- Relieve reactor operators of peripheral duties and communications
- Prevent congestion in the Control Room
- Performs EOF functions
  - Until the EOF is staffed & operational
  - Determine recommended public protective actions
  - Coordinate response activities with offsite agencies
- TSC located near the Control Room
  - Common TSC (Units 1-4)

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# TSC Location

- Same radiological habitability as Control Room
- Located near the Control Room
  - 2-minute walking time (NUREG-0696, 1981)
  - Face-to-face communications
- Two key reasons for location near Control Rm.
  - Communication: Allow for necessary management interaction & technical information exchange
  - Data Availability: Provide TSC access to Control Room data

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# TSC Location (cont.)

- Staff has approved the common TSC
  - 2-minute walking time (TSC to Control Rm.)
    - Addressed in generic ITAAC 8.1.2 (RG 1.206, Tbl. C.II.1-B1)
    - <u>Advanced communication capabilities may be used to satisfy the two minute travel time</u>
    - COL applicant will adopt design certification criteria, or otherwise specify TSC location
  - Two key reasons for location near Control Room
    - Communications & Data Availability
  - Technical advancements in both since 1981 (NUREG-0696)
  - Permit Condition 8 (AP1000 vs. ESP)
    - "An applicant for a combined license (COL) referencing this early site permit shall resolve the difference between the VEGP Units 3 and 4 common Technical Support Center (TSC), and the TSC location specified in the AP1000 certified design."

# TSC Location
## AP1000 vs. ESP Appl.

- AP1000 DCD
  - Current AP1000 certified design (App. D to 10 CFR Part 52)
    - TSC located in Annex Bldg. (near Control Rm.) – Tier 1 (ITAAC)
    - TSC location change requires Exemption Request
  - Ongoing AP1000 DCD rulemaking amendment
    - *Main TSC Operations Area* renamed *Control Support Area* (CSA)
    - TSC (functional capabilities) still located in CSA (Annex Bldg.)
    - TSC location – Tier 1 designation changed to Tier 2*
    - TSC location change requires prior NRC approval
- ESP application
  - Reflects the Tier 2* TSC location designation
  - Departs from CSA location for the TSC
  - Proposes a single, common TSC (new Administration Bldg.)
  - Requests NRC approval of departure

# TSC Location
## AP1000 Certified Design

- Tier 1 Design Information (AP1000)
  - Approved and Certified
  - Design departures (plant-specific) require Exemptions
  - Current AP1000 certified design
    - TSC location is a Tier 1 ITAAC
- Tier 2* Design Information
  - Approved but not Certified
  - Design departures require prior NRC approval
  - Amended AP1000 design (ongoing rulemaking)
    - TSC location is Tier 2* information

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# Communication Capabilities

- Control Room Communication Capabilities
  - Emergency Notification System (ENS)
  - Dedicated telephones to TSC/EOF/OSC
    - Health Physics Network (HPN) (TSC & EOF)
  - Normal plant telephones & facsimile
  - In-plant radio console & plant page system
  - Sound-powered telephones
  - Southern Company Communications

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# Data Capabilities

- Control Room Data Capabilities
  - Protection and Monitoring System (PMS)
  - Qualified Data Processing System (QDPS)
  - Safety Parameter Display System (SPDS)
  - Emergency Response Data System (ERDS)

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# SPDS

- Safety Parameter Display System (SPDS)
  - Displays plant parameters from which the safety status of operation may be assessed in the control room, TSC, and EOF.
  - Primary function to help operating personnel make quick assessments of plant safety status.

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# ERDS

- Emergency Response Data System (ERDS)
  - A direct near real-time electronic data link between the licensee's onsite computer system and the NRC Operations Center.
  - Provides automatic transmission of a limited data set of selected parameters.
  - Supplements existing voice transmission over the Emergency Notification System (ENS).

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# TSC Location

- Staff approval considerations
  - Advances in communication capabilities (since 1981)
  - Increased efficiency of a common facility
  - Eliminates need for duplication of systems/equip.
  - Meets TSC habitability requirements
  - Located moderate distance from all Control Rooms
    - Between Unit 2 and 3 power blocks
    - Within the VEGP site Protected Area
  - Eliminates confusion re: which TSC to staff
  - Eliminates need to staff multiple TSCs
    - For multi-unit events

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# TSC Location

- Staff approval considerations (cont.)
  - Coordinates response among all site units (e.g., Control Rooms, onsite personnel)
  - Provides centralized point of support for entire site
  - Provides single point of contact for offsite support
  - Addresses Security-related events (post-9/11)
    - Location farther away from Control Rooms
  - Backup TSC is available onsite (Units 1 & 2)
  - NRC previously approved a TSC location ~15 minutes from the Control Room
    - Clinton Power Station (March 12, 2007) (ADAMS ML070540270)

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# Emergency Planning

## Conclusions

- First complete & integrated Emergency Plan under 10 C.F.R. Part 52
- Incorporated elements of the existing onsite, State, and County plans
- First example of Emergency Planning ITAAC (*Energy Policy Act of 1992*)
  - "The Commission shall identify within the combined license the inspections, tests, and analyses, including those applicable to emergency planning, that the licensee shall perform, and the acceptance criteria that, if met, are necessary and sufficient to provide reasonable assurance that the facility has been constructed and will be operated in conformity with the license, the provisions of this Act, and the Commission's rules and regulations."
- Staff identified 7 (EP) Permit Conditions (EALs & TSC location)
- NRC & FEMA findings (subject to the permit conditions & ITAAC):
  - The onsite and offsite plans are adequate.
  - There is reasonable assurance the plans can be implemented.
  - There is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency.

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