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# William States Lee III Nuclear Station COL Application Overview



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Presentation to NRC Staff  
*January 10, 2008*

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## Agenda – Session II

1230-1235	Opening Statements & Introductions	NRC
1235-1240	Opening Statements & Introductions	Peter Hastings (Duke)
1240-1315	COL Application Overview & Navigation	Chris Nolan (Duke)
1310-1345	FSAR Overview	Chris Nolan (Duke)
1345-1400	Break	
1400-1445	FSAR Site-Specific Overview	John McConaghy (Duke)
1445-1600	Environmental Report Overview	Ted Bowling (Duke)
1600-1615	Wrap-Up & Closing Remarks	Duke / NRC



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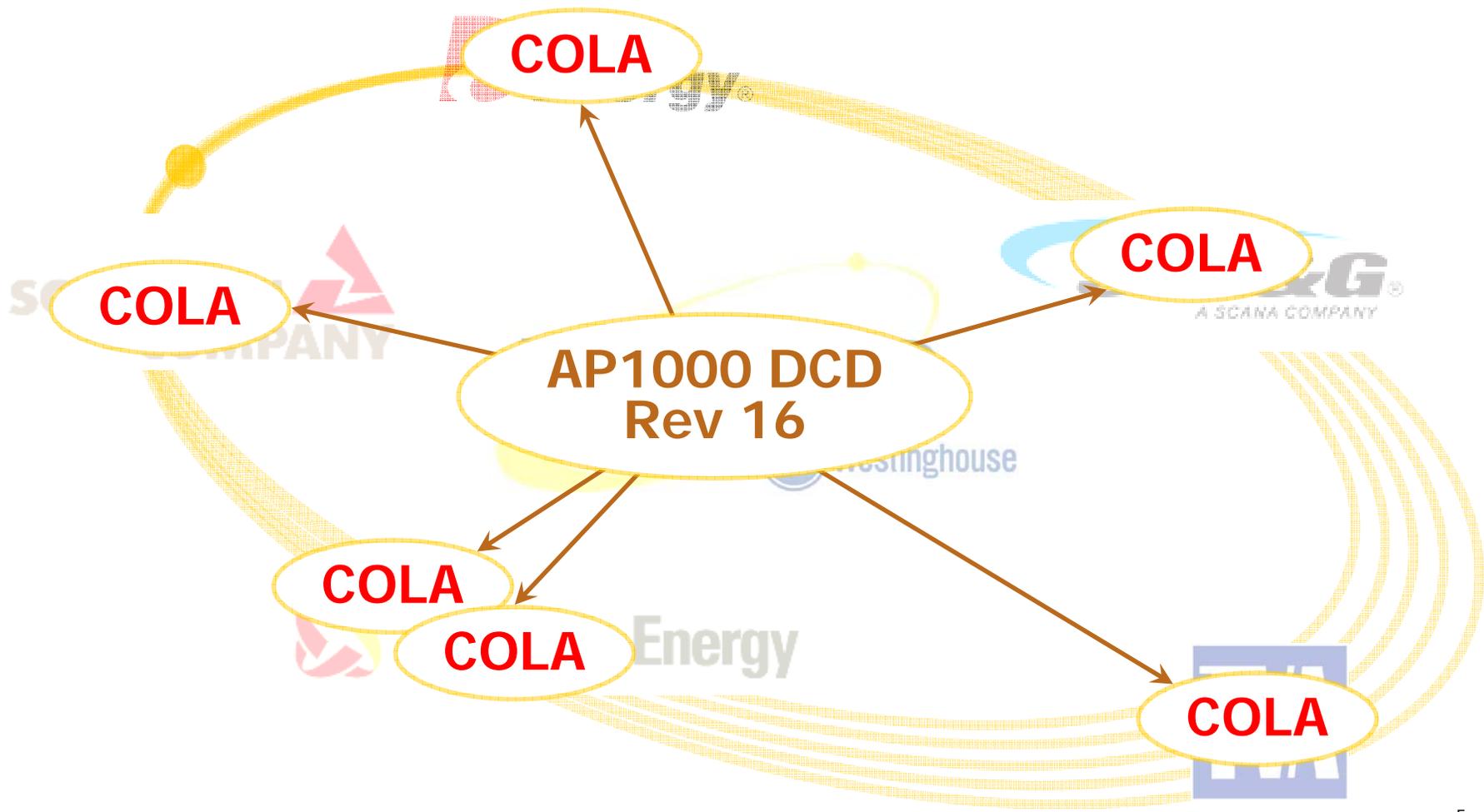
# Lee Nuclear COL Application Overview & Navigation

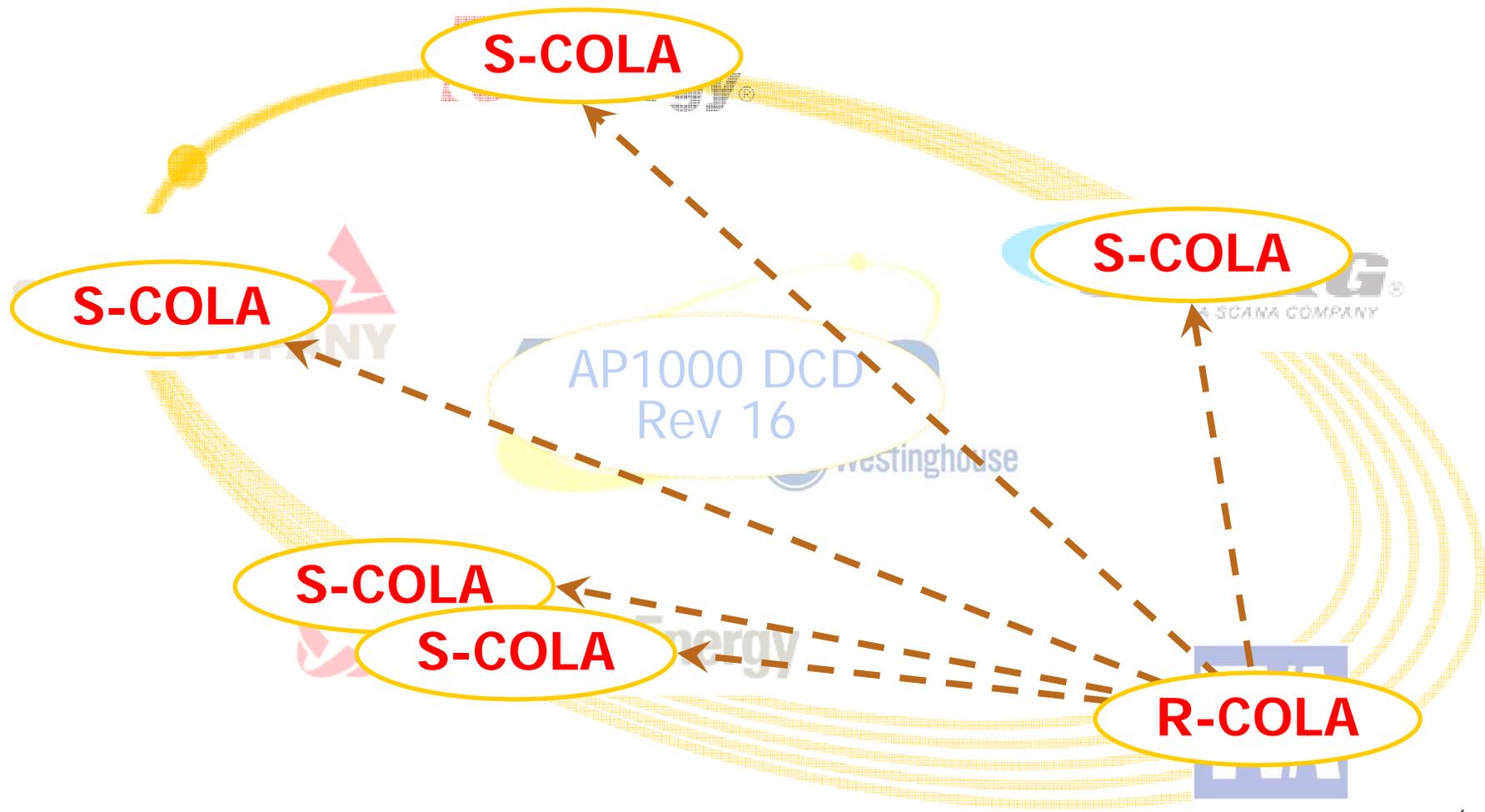
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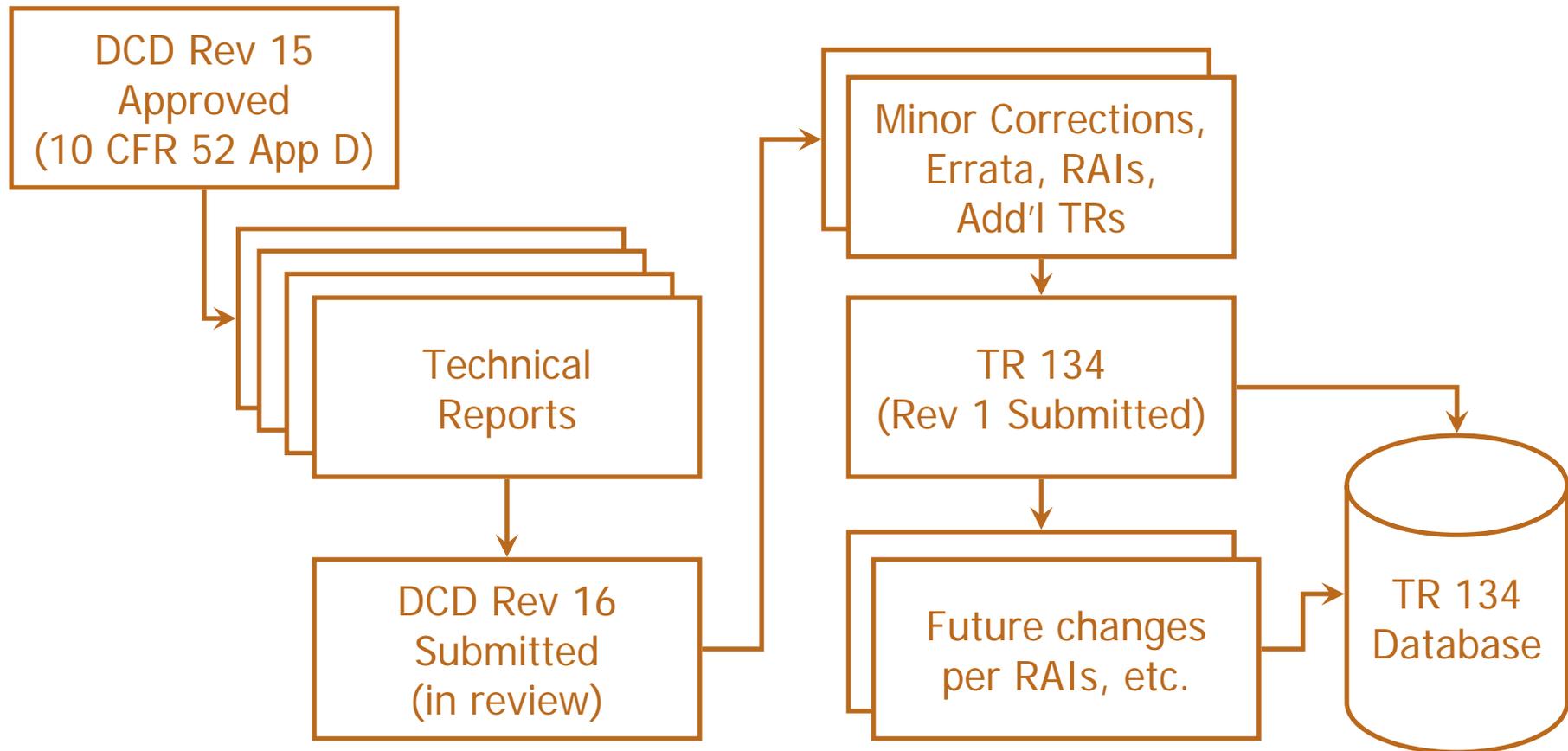
# AP1000 Design-Centered Work Group







# AP1000 Design Control Document



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## COL Application Contents

- Cover Letter & Affidavits
- Part 1 – Administrative & Financial Info
- Part 2 – Final Safety Analysis Report
- Part 3 – Environmental Report
- Part 4 – Technical Specifications
- Part 5 – Emergency Plan
- Part 6 – Limited Work Authorization Information (not used)
- Part 7 – Departures & Exemption Requests
- Part 8 – Safeguards Information (Separate Cover)
- Part 9 – Other Withheld Information
- Part 10 – License Conditions & ITAAC
- Part 11 – Enclosures, i.e., QAPD

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# COL Application Navigation

- File Structure
- WLS\_COLA
  - AP1000\_DCD\_R16\_Public
  - DCD\_Departures (Part 7)
  - Enclosures (Part 11)
  - EP (Part 5)
  - ER (Part 3)
  - FSAR (Part 2)
  - GEN\_FIN (Part 1)
  - ITAAC (Part 10)
  - LWA\_Request (Part 6)
  - Safeguards (Part 8)
  - TS (Part 4)
  - Withheld (Part 9)

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# COL Application Navigation

- Organization
  - Text – typically one file per document or chapter
  - Tables follow sections in text files, e.g., 1.6, 1.9, 2.5
  - Figures are separate files
  - Large appendices are separate files, e.g., FSAR 2AA & 2BB
  
- Links & Search Capability
  - FSAR to IBR DCD section
  - Cross references to DCD and COLA sections
  - Tables and Figures
  - References list
  - ER to FSAR cross-reference

# FSAR Left Margin Annotations (LMAs)

MARGIN NOTATION	DEFINITION AND USE
STD DEP X.Y.Z-#	FSAR information that departs from the generic DCD and is common for parallel applicants. Each Standard Departure is numbered separately at an appropriate level, e.g., STD DEP 9.2-1 or STD DEP 9.2.1-1
NPP DEP X.Y.Z-#	FSAR information that departs from the generic DCD and is plant specific. NPP is replaced with a plant specific identifier (WLS in this case). Each Departure item is numbered separately at an appropriate subsection level, e.g., WLS DEP 9.2-2, or NPP DEP 9.2.1-2
STD COL X.Y-#	FSAR information that addresses a DCD Combined License Information item and is common to other COL applicants. Each COL item is numbered as identified in DCD Table 1.8-2 and FSAR Table 1.8-202, e.g., STD COL 4.4-1, or STD COL 19.59.10.5-1
NPP COL X.Y-#	FSAR information that addresses a DCD Combined License Information item and is plant specific. NPP is replaced with a plant specific identifier. Each COL item is numbered as identified in DCD Table 1.8-2 and FSAR Table 1.8-202, e.g., NPP COL 4.4-1, or NPP COL 19.59.10.5-1
NPP CDI or STD CDI	FSAR information that addresses DCD Conceptual Design Information (CDI). Replacement design information is generally plant specific; however, some may be common to other applicants. NPP is replaced with a plant specific identifier. STD is used if it is common. CDI information replacements are not numbered.
STD SUP X.Y-#	FSAR information that supplements the material in the DCD and is common to other COL applicants. Each SUP item is numbered separately at an appropriate subsection level, e.g., STD SUP 1.10-1, or STD SUP 9.5.1-1
NPP SUP X.Y-#	FSAR information that supplements the material in the DCD and is plant specific. NPP is replaced with a plant specific identifier. Each SUP item is numbered separately at an appropriate subsection level, e.g., NPP SUP 3.10-1, or NPP SUP 9.2.5-1
DCD	FSAR information that duplicates material in the DCD. Such information from the DCD is repeated in the FSAR only in instances determined necessary to provide contextual clarity.

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## COL Application

### Part 1 – Administrative & Financial

- Addresses 50.33 information needs:
  - General Information
  - Applicant's Corporate information
  - Financial information
    - Including construction & related fuel cycle estimates and reasonable assurance
    - Conforms to COL/DC-ISG-002
    - Proprietary / Business Sensitive Info (Part 9)
  - Decommissioning funding requirements – 10 CFR 50.75
    - Appendix 1A - Decommissioning Cost Estimate Report

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## COL Application

### Part 2 – Final Safety Analysis Report (FSAR)

- COL applications based on incorporation by reference of DCD Rev 16 plus TR 134 Rev. 1 (DCD Rev 16 impacts)
- “IBR” = Incorporation By Reference
- FSAR Table 1.6-201
  - DCD Rev 16
  - TR 134
  - NEI templates
- Standardization of COL Applications (FSAR)

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## COL Application

### Part 3 – Environmental Report

- Provides info needed for NRC review per NUREG-1555, Oct 1999
- Also reflects lessons learned from:
  - License Renewal environmental reviews
  - Early Site Permit environmental reviews
  - New and updated environmental regulations
    - NRC pre-application site visits (including T-2 visit)
- Chapter, Section (X.Y) & Subsections (X.Y.Z) per NUREG-1555

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## COL Application

### Part 4 – Technical Specifications (TSs)

- IBR of DCD GTS (including Bases) – no departures or exemptions
- COL item – Fill in brackets – most filled in
- Some brackets remain
  - proposed License Condition in Part 10
- Section A includes information on GTS brackets
- Section B includes a full set of PSTS and Bases

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## COL Application

### Part 5 – Emergency Planning Information

- Site specific licensee Emergency Plan
- Includes Certifications and Cross-references
- State and local plans
- Evacuation Time Estimate
- EP ITAAC in Part 10
- Proposed License Condition for submittal of EPIPs

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## COL Application

### Part 7 – Departures and Exemptions

- Exemptions (2)
  - Fitness for duty program description per expected rule
  - COLA organization and numbering per guidance
- Departures (2)
  - STD DEP 1.1-1
    - Administrative departure for organization and numbering for the FSAR sections
  - WLS DEP 18.8-1
    - TSC & OSC relocations

## COL Application

### Part 8 - Safeguards Information

- Separate Submittal
  - Security Plans
  - Not discussed in this public meeting

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# COL Application

## Part 9 – Withheld Information

- Information withheld under 10 CFR 2.390
- Header identifies applicable regulation
  - 2.390(a)(4) – Trade Secrets, Commercial, or Financial Information
  - 2.390(a)(6) – Personal or Medical Information
  - 2.390(a)(9) – Geologic & Geophysical, including Wells
  - 2.390(d)(1) – Physical Security Information
- Linked to Part 9 Index
  - Only in Parts 1, 2, and 3
  - Public version [redacted]
  - Non-Public version - links to complete information in Part 9
- Follow link to one of three files
  - Part 1 – Financial Information
  - Part 2 – Personal Information, Geophysical, & Physical Security
  - Part 3 – Personal Information, Geophysical, & Physical Security

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## COL Application

### Part 10 – Proposed License Conditions & ITAAC

- Proposed License Conditions to:
  - Incorporate ITAAC into COL
  - Complete Holder items prior to initial fuel load
  - Implement Operational Programs by specific milestones in 13.4
  - Provide Fire Protection Program revision criteria
  - Provide Security Program revision criteria
  - Provide operational readiness schedule
  - Provide Vendor AE Constructor qualifications
  - Provide Startup Program revision criteria
  - Complete bracketed items in Tech Specs
  - Incorporate Environmental Protection Plan
- Draft Environmental Protection Plan
- ITAAC – Security, Plant Specific, Emergency Planning

## COL Application Part 11 – Enclosures

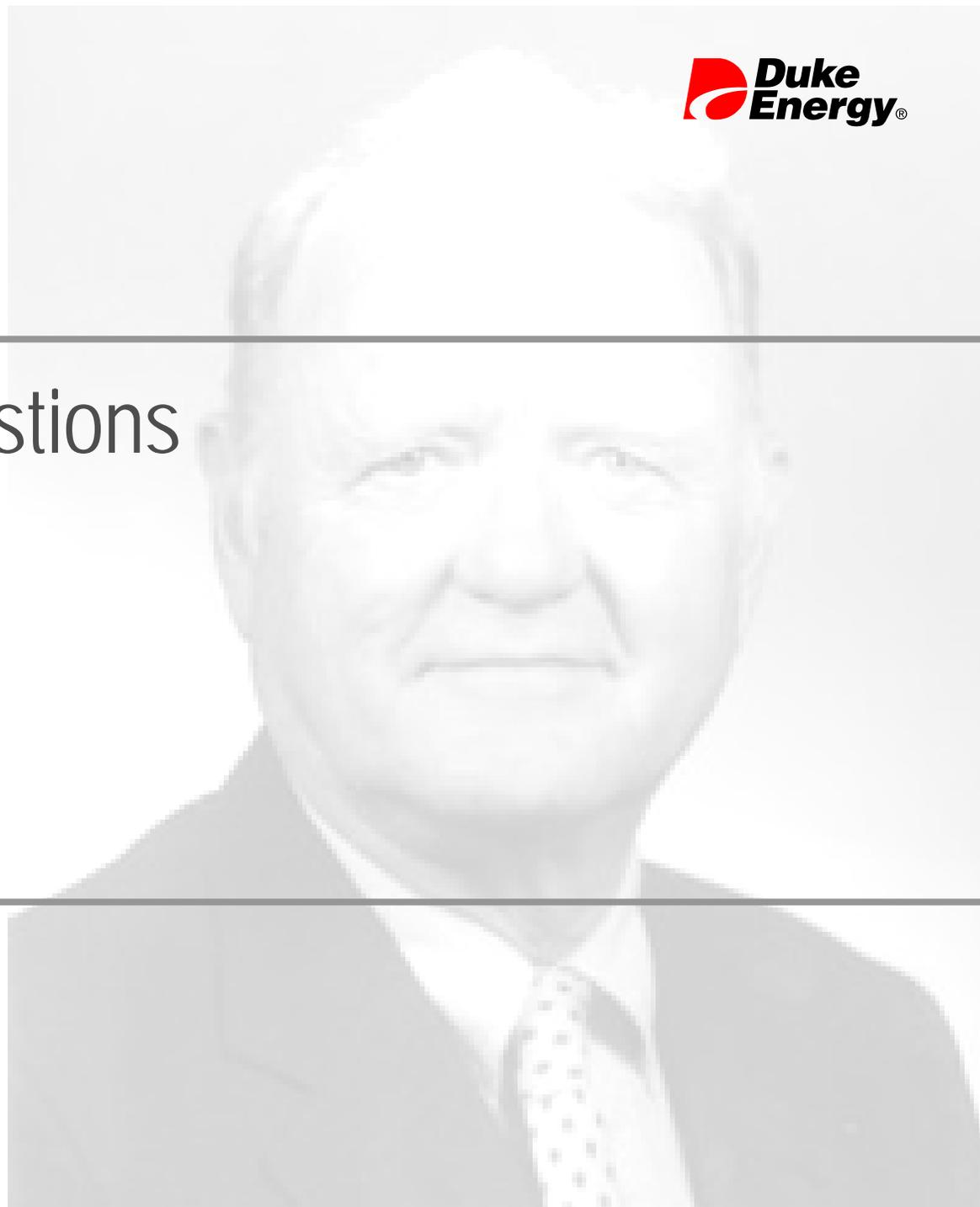
- Quality Assurance Program Description
  - Addressed in FSAR Section 17.5
  - NEI-06-14-A
  - Site-specific (bracketed) information completed



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# Comments/Questions

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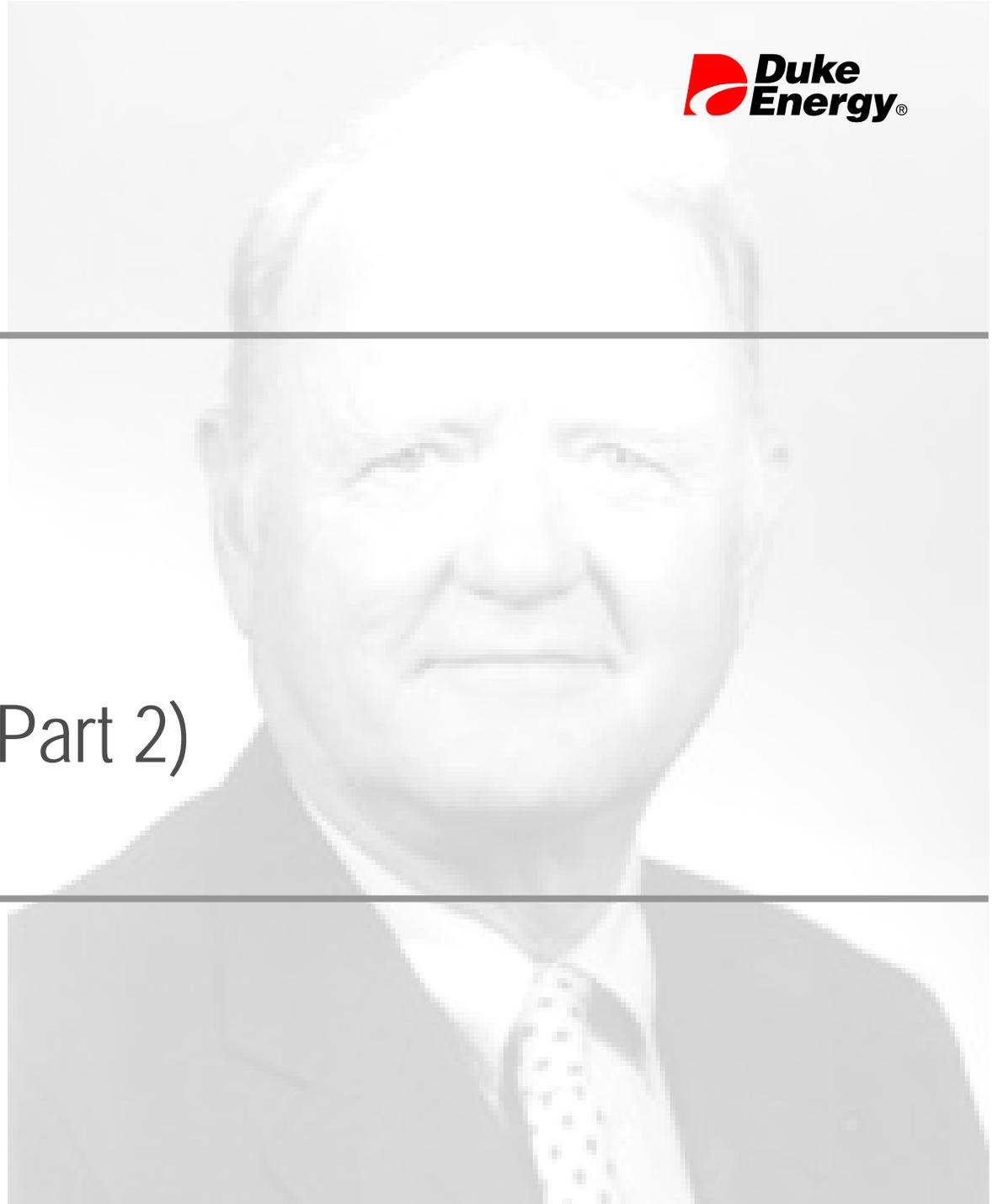


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Lee Nuclear

FSAR Overview  
(COL Application Part 2)

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# FSAR Chapter 1

## Introduction and General Description

- IBR of DCD; STD DEP 1.1-1
- Discussion of format, e.g., LMAs and numbering of Figures, Tables, & References
- Lists - acronyms, RG usage, SRP conformance, RG conformance
- Summary of Departures as Table 1.8-201, e.g., STD DEP 1.1-1
- STD COL 1.9-1, 2\*, 3\* (RGs, BLs & GLs, and USI/GSIs)
- COL Item tabulation as Table 1.8-202
- Proposed License Condition
  - Vendor/Constructor/AE qualifications
- Section 1.10 on multi-unit site construction considerations

(\* these COL items not numbered in DCD)

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## Summary of COL Information Items

- 175 COL Information Items (DCD Rev 16 Table 1.8-2)
- 45 expected to close via DCD Rev 16
- 15 COL Holder Items (18 in Table 1.8-202)
  - To be addressed post issuance of COL (as built info)
  - Proposed license condition in Part 10
  - 3 Holder Items (per DCD) addressed in COLA
    - 3.11-1, 9.5-6, 10.1-1
- 115 addressed via COL application
  - Includes three covered by operational program TRs

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## COL Holder Items (Examples)

### 3.7-3 Seismic Interaction Review

- *The seismic interaction review will be updated by the Combined License holder for as-built information. This review is performed in parallel with the seismic margin evaluation. The review is based on as-procured data, as well as the as-constructed condition. The as-built seismic interaction review is not provided with the COL application, but is completed prior to fuel load.*

### 5.3-4 Reactor Vessel Materials Verification

- *The Combined License holder will complete prior to fuel load verification of plant-specific belt line material properties consistent with the requirements in subsection 5.3.3.1 and Tables 5.3-1 and 5.3-3. The verification will include a pressurized thermal shock evaluation based on as procured reactor vessel material data and the projected neutron fluencies for the plant design objective of 60 years. This evaluation report will be submitted for NRC staff review.*

## FSAR Chapter 2 Site Characteristics

- Mostly site specific material, STD DEP 1.1-1
- Comparison of WLS Site Characteristics to DCD Site Parameters
  - Combined listing of DCD Tier 1 Table 5.0-1 and Tier 2 Table 2-1
- SUP material and COL items

## FSAR Chapter 3

### Design of SSCs

- Mostly IBR of DCD
- Dual unit information (DCD is for single unit)
- Inservice testing program description
  - Snubbers
  - Valves (no pumps)
- SUP material and COL items

## FSAR Chapter 4

### Reactor

- Mostly IBR of DCD
- COL items

## FSAR Chapter 5 Reactor Coolant System

- Mostly IBR of DCD
- Inservice inspection program (Class 1)
- SUP material and COL items

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## FSAR Chapter 6 Engineered Safety Features

- Mostly IBR of DCD
- Containment leak rate testing program
  - (per approved NuStart TR)
- Inservice inspection program (Class 2 & 3)
- SUP material and COL items

# FSAR Chapter 7

## Instrumentation and Controls

- All IBR of DCD

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## FSAR Chapter 8 Power Systems

- Mostly IBR of DCD
- Conceptual design information (CDI) replacement
- Switchyard and grid information
- SUP material and COL items

## FSAR Chapter 9 Auxiliary Systems

- Mostly IBR of DCD; STD DEP 1.1-1
- SUP material and COL items

## FSAR Chapter 10 Steam and Power Conversion

- Mostly IBR of DCD
- Full-text incorporation for 10.4.5 – Circulating water (CDI replacement)
- Inservice inspection program
- SUP material and COL items

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## FSAR Chapter 11

### Radioactive Waste Management

- Mostly IBR of DCD
- Adopts NEI 07-11
  - Cost-benefit analysis template
- Adopts NEI 07-10
  - Process control program description
- Adopts NEI 07-09
  - Offsite dose calculation manual description
- Radiation and effluent monitoring program
- SUP material and COL items

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## FSAR Chapter 12 Radiation Protection

- Mostly IBR of DCD
- 12.1 – ALARA
  - IBR of NEI 07-08 re ALARA
- 12.4 – Dose to construction workers
- 12.5 - Radiation protection program  
(Appendix 12AA)
  - IBR of NEI 07-03 re Radiation Protection Program
- SUP material and COL items

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## FSAR Chapter 13

### Conduct of Operations

- IBR of DCD; STD DEP 1.1-1
- 13.1 – Organization – generic terms
- 13.2 – Training
  - IBR of NEI 06-13-A re Training Program
- EP (13.3) and SGI (13.6) are separate documents
  - 13.6 refers to NEI 03-12 Appendix F for construction
- 13.4 – Operational Programs
  - Proposed License Conditions in Part 10 re Implementation and Readiness
- 13.5 – Procedures
- 13.7 – Fitness for duty (not in DCD)
  - References NEI 06-06
- SUP material and COL items

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## FSAR Chapter 14 Initial Test Program

- Mostly IBR of DCD
- ITAAC criteria
- ITAAC screening
- SUP material and COL items

## FSAR Chapter 15 Accident Analysis

- Mostly IBR of DCD
- Tank failure analysis moved to Chapter 2
- SUP material and COL items

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## FSAR Chapter 16 Technical Specifications

- Mostly IBR of DCD
- 16.1 – Plant specific TS in Part 4
- COL items

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## FSAR Chapter 17

### Quality Assurance

- Mostly IBR of DCD; STD DEP 1.1-1
- Quality assurance program description (QAPD) in Part 11
  - QAPD based on approved NEI 06-14-A
  - IBR of NEI 07-02 re Maintenance Rule Program
- Two new sections not in DCD
  - 17.5 (QA for new license applicants)
  - 17.6 (Maintenance rule)
- SUP material and COL items

## FSAR Chapter 18

### Human Factors Engineering

- Mostly IBR of DCD
- WLS 18.8-1 – Moved TSC & OSC
- COL items

# FSAR Chapter 19

## Probabilistic Risk Assessment

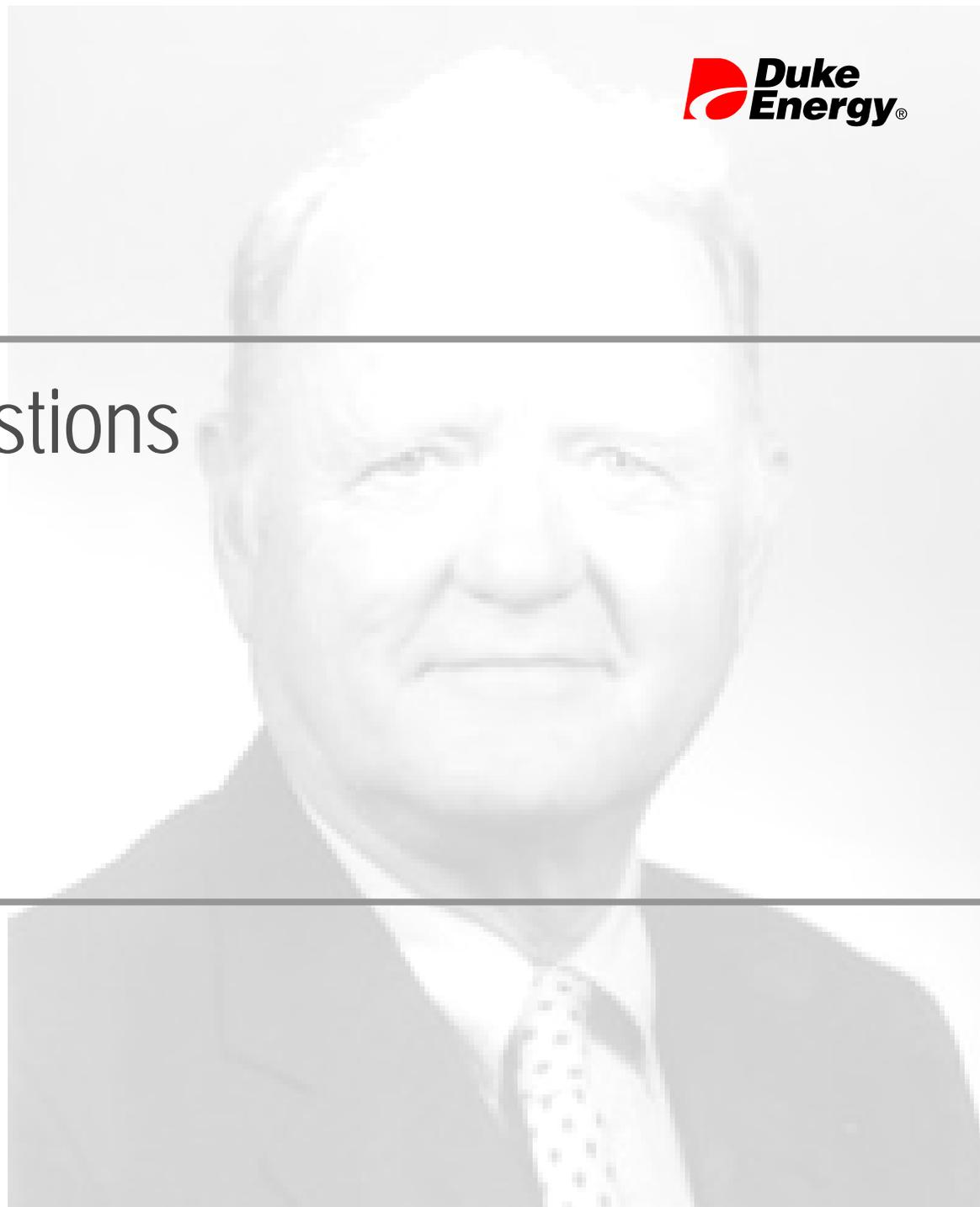
- Mostly IBR of DCD
- SUP material and COL items



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# Comments/Questions

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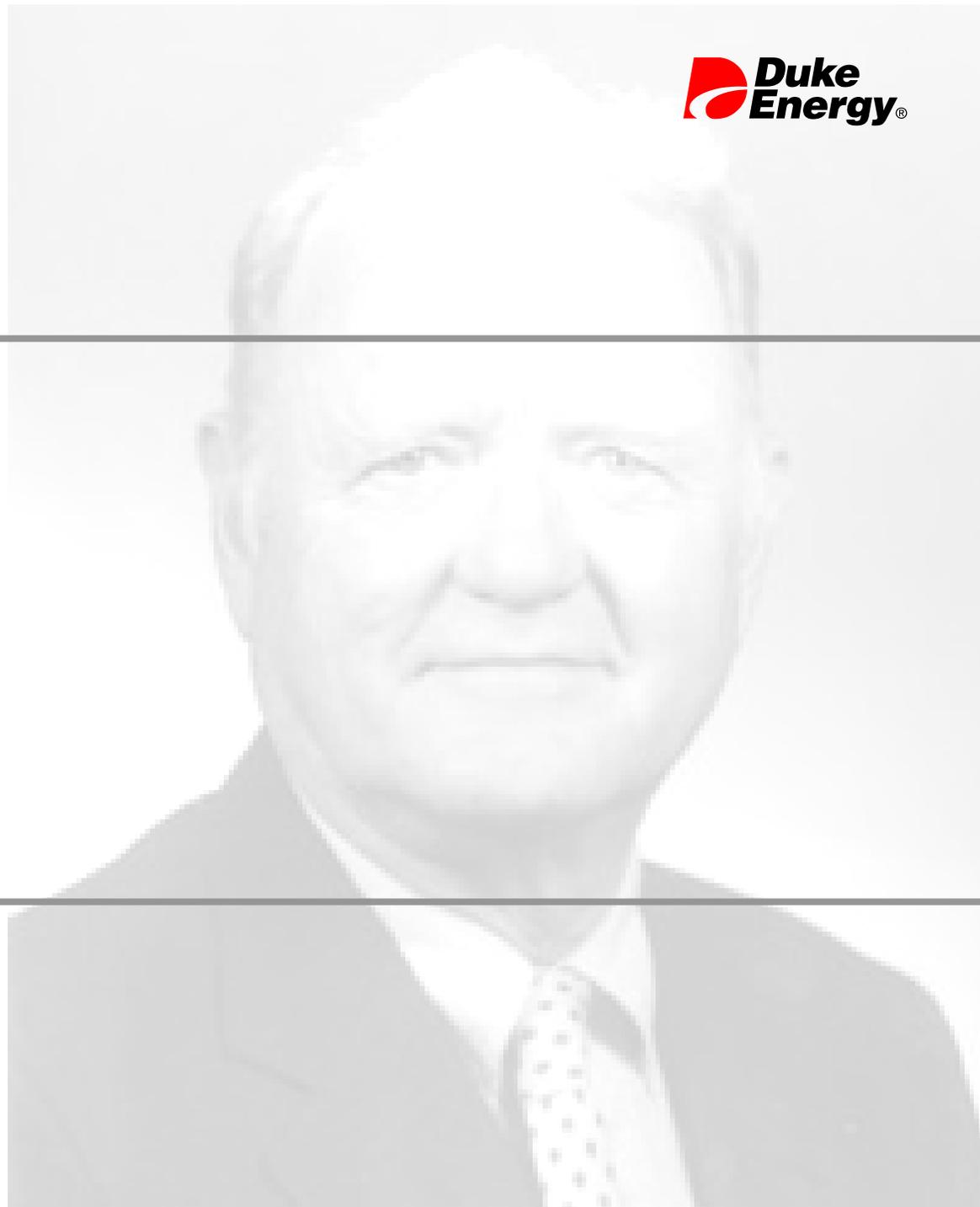




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Break

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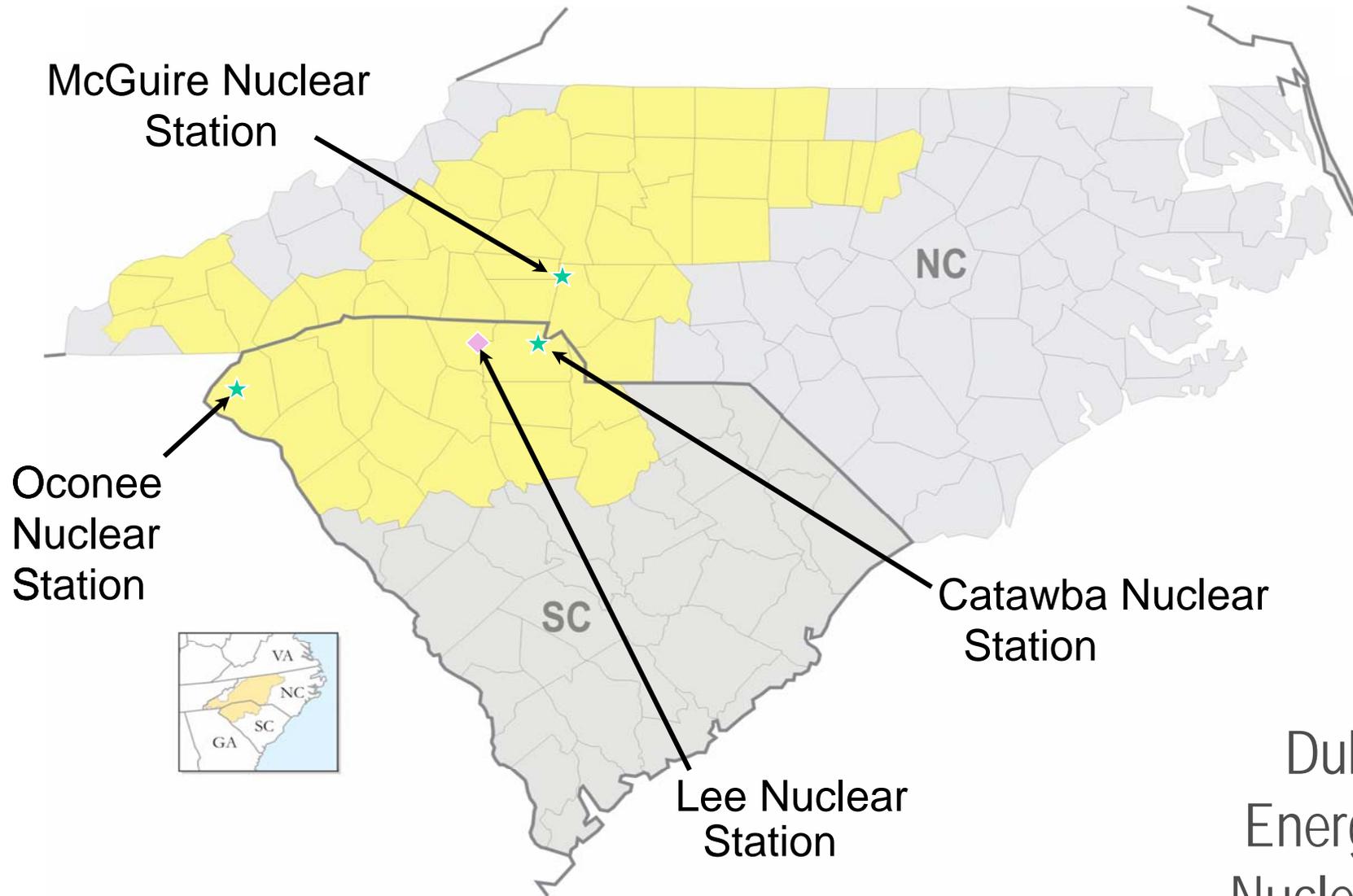
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Lee Nuclear

Site Overview

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Duke  
Energy  
Nuclear

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## Lee Nuclear Site

- Historical:
  - Cherokee Site initial development as part of "P-81" project initiated in early 1970s
  - NRC EIS (NUREG-75/089) and Construction Permit issued in 1975
  - Unit 1 partially constructed; Unit 2 largely excavated; Unit 3 partially excavated
  - Duke Power cancelled Cherokee Project 1983
  - Sold property to private party
- Site Partially Developed including:
  - Nuclear Service Water Pond
  - Cooling Water Sedimentation Basin
  - Excavation of Power Block
  - Partial Construction of Unit 1 Containment

## Lee Nuclear Site

- Duke announced in 2005-2006:
  - Intent to pursue COL for new plant
  - Reactor technology selection (AP1000)
  - Site Selection (reacquired former Cherokee site)
  - Construction plans for two units
  - No decision to construct has been made
- Site characterization commenced 2005
- Demolition of previous facilities underway
- Base slab of Cherokee Unit 1 legacy structures to remain in-place as fill concrete

# Cherokee Site Before Lee Nuclear Station Investigation Activities



# Adaptation of WS Lee AP1000s to Former Cherokee Site



## Comparison of Lee Site Characteristics to AP1000 Parameters

- AP1000 design is based on specific site parameters
- Lee FSAR Chapter 2 describes the characteristics and site-related design parameters to demonstrate that the site is acceptable for deploying AP1000
- FSAR Tables 2.0-201 and 2.0-202 compare Lee site characteristics to AP1000 design parameters
- The Lee site falls within the AP1000 envelope
- A discussion on geology and seismology was presented earlier

# Comparison of Lee Site Characteristics to AP1000

- Air Temperature is within AP1000 envelope
- Wind Speeds (conventional and tornado) are within AP1000 envelope
- RG 1.76 Tornado missiles are less energetic than those used in AP1000 design

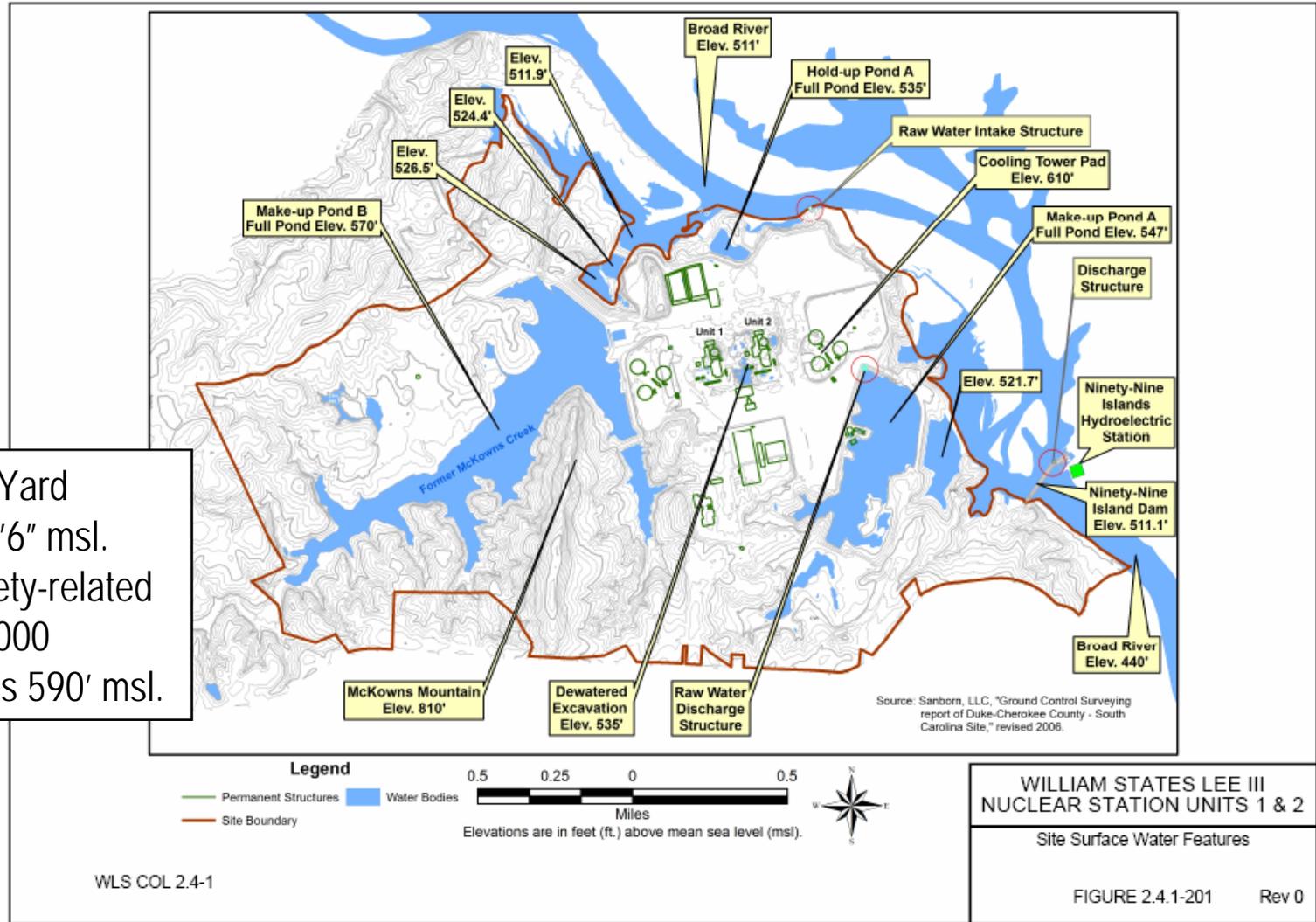
	AP 1000 DCD Site Parameters	WLS Site Characteristic	WLS FSAR Reference	WLS Within Site Parameter
<b>Air Temperature</b>				
Maximum Safety <sup>(a)</sup>	115°F dry bulb / 80°F coincident wet bulb	93°F dry bulb/ 74°F coincident wet bulb(0.4% exceedance)	Table 2.3-293	Yes
	85.5°F wet bulb (noncoincident)	77°F (0.4% exceedance)	Table 2.3-293	Yes
Minimum Safety <sup>(a)</sup>	-40°F	19°F (0.4% exceedance)	Table 2.3-293	Yes
Maximum Normal <sup>(b)</sup>	100°F dry bulb / 80.1°F coincident wet bulb	91°F dry bulb / 74°F coincident wet bulb (1% exceedance)	Table 2.3-293	Yes
	80.1°F wet bulb (noncoincident) <sup>(c)</sup>	76°F wet bulb (1% exceedance)	Table 2.3-293	Yes
Minimum Normal <sup>(b)</sup>	-10°F	23°F (1% exceedance)	Table 2.3-293	Yes
<b>Wind Speed</b>				
Operating Basis	145 mph (3 second gust); importance factor 1.15 (safety), 1.0 (nonsafety); exposure C; topographic factor 1.0	96 mph (3 second gust) (110 mph with 1.15 importance factor); exposure C; topographic factor 1.0	Subsection 2.3.1.2.8	Yes
Tornado	300 mph	230 mph	Subsection 2.3.1.2.2	Yes
<b>Missiles</b>				
Tornado	4000 - lb automobile at 105 mph horizontal, 74 mph vertical	4000 - lb automobile at 105 mph horizontal, 74 mph vertical	Subsection 3.5.1.5 <sup>(f)</sup>	N/A <sup>(f)</sup>
	275 - lb, 8 in. shell at 105 mph horizontal, 74 mph vertical	275 - lb, 8 in. shell at 105 mph horizontal, 74 mph vertical	Subsection 3.5.1.5 <sup>(f)</sup>	N/A <sup>(f)</sup>
	1 inch diameter steel ball at 105 mph horizontal and vertical	1 inch diameter steel ball at 105 mph horizontal and vertical	Subsection 3.5.1.5 <sup>(f)</sup>	N/A <sup>(f)</sup>

## Comparison of Lee Site Characteristics to AP1000 (continued)

- Maximum flood level is more than six feet below AP1000 requirement
- Maximum groundwater level is four feet below AP1000 requirement
- Plant grade is 6" below AP1000 Elevation 100'
- Precipitation is less than AP1000 envelope

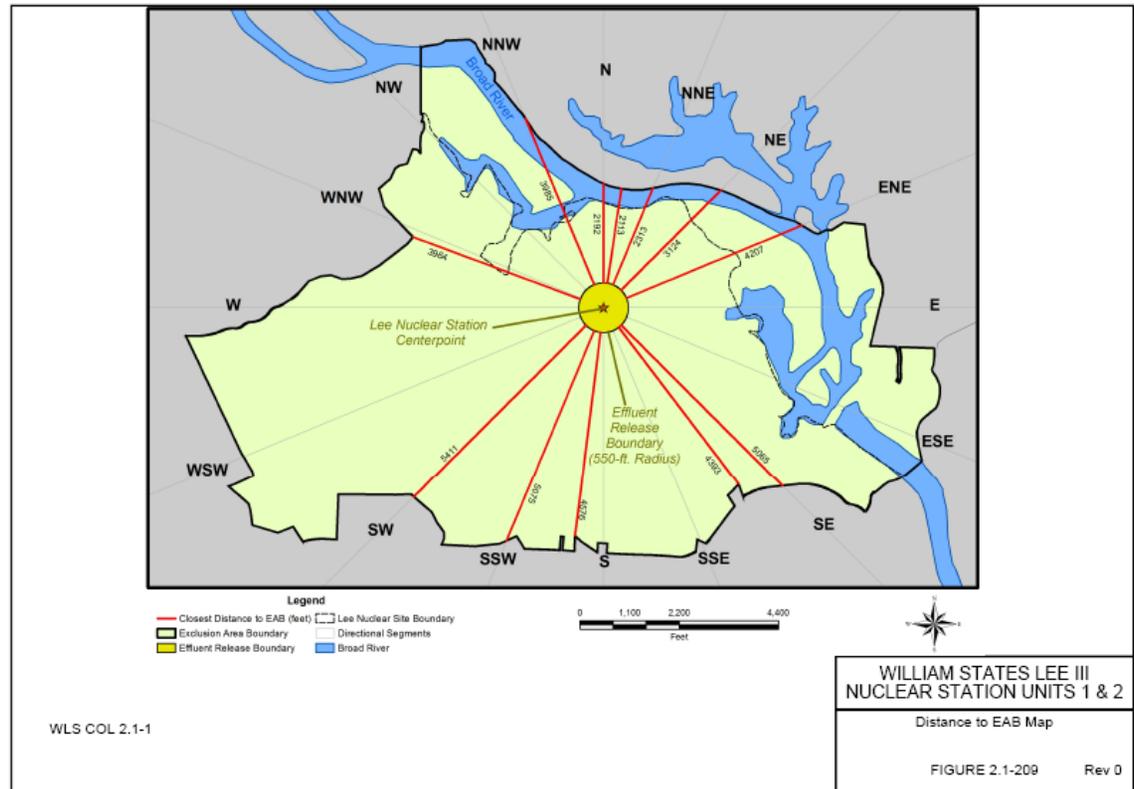
	AP 1000 DCD Site Parameters	WLS Site Characteristic	WLS FSAR Reference	WLS Within Site Parameter
<b>Flood Level</b>	Less than plant elevation 100' (WLS Elevation 590' msl)	583.85' msl	Subsection 2.4.3.5	Yes
<b>Groundwater Level</b>	Less than plant elevation 98' (WLS Elevation 588' msl)	Maximum and average groundwater elevation is projected to be around 584 and 579.4 ft. msl with AP1000 elevation at 590 ft. msl, respectively. This allows for approximately 5 to 10 ft. of unsaturated interval below the plant grade elevation 100 ft.	Subsection 2.5.4.1.3 Figure 2.4.12-205. (Sheet 3 of 4)	Yes
<b>Plant Grade Elevation</b>	Less than plant elevation 100' (WLS elevation 590' msl) except for portion at a higher elevation adjacent to the annex building	589.5 ft. msl	Subsection 2.4.1.1.3	Yes
<b>Precipitation</b>				
Rain	19.4 in./hr (6.3 in./5 min)	18.9 in./hr. (6.2 in/5 min) Probable Maximum Precipitation	Table 2.4.2-203	Yes
Snow / Ice	75 pounds per square foot on ground with exposure factor of 1.0 and importance factors of 1.2 (safety) and 1.0 (non-safety)	15.8 pounds per square foot	Subsection 2.3.1.2.7.3	Yes

# Lee Site Surface Features



# Comparison of Lee Site Characteristics to AP1000 (continued)

- Atmospheric dispersion factors are within AP1000 envelope
- FSAR Table 2.0-201 presents  $\chi/Q$  for site boundary and low population zone
- FSAR Table 2.0-202 presents  $\chi/Q$  for control room
- Minimum distance to the exclusion area boundary is one-half mile, as required for AP1000



# Comparison of Lee Site Characteristics to AP1000 (continued)

- Hard rock site with high static and dynamic bearing capacity
- Shear wave velocity greater than 9200 fps
- Uniform support conditions
- No liquefaction or surface deformation potential

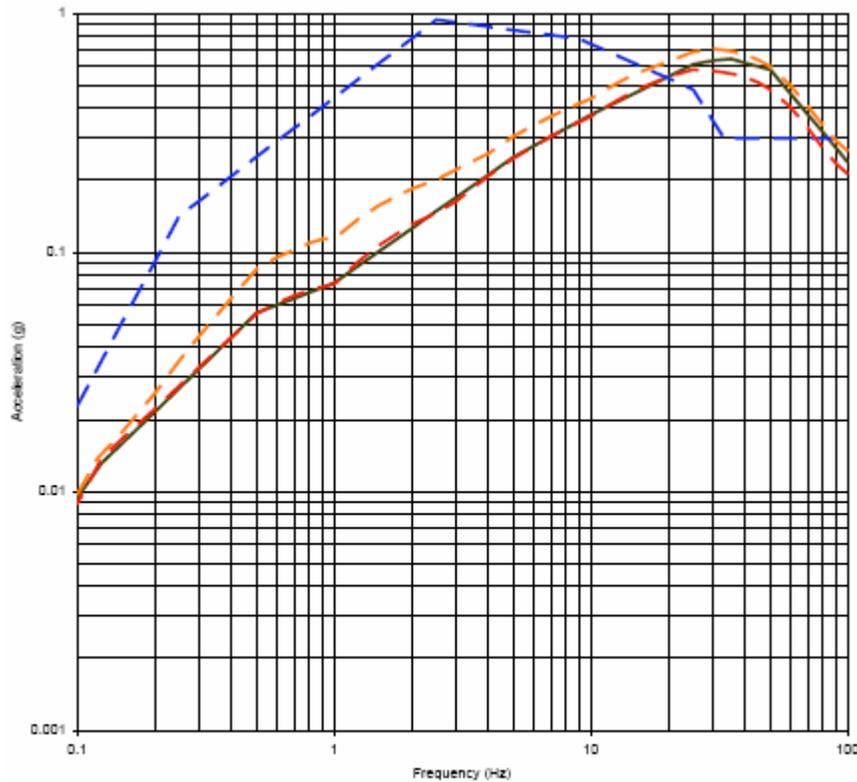
	AP 1000 DCD Site Parameters	WLS Site Characteristic	WLS FSAR Reference	WLS Within Site Parameter
<b>Soil</b>				
Average Allowable Static Bearing Capacity	Greater than or equal to 8,600 lb/ft <sup>2</sup> over the footprint of the nuclear island at its excavation depth	190,000 to 285,000 lb/ft <sup>2</sup>	Subsection 2.5.4.10.1	Yes
Maximum Allowable Dynamic Bearing Capacity for Normal Plus SSE	Greater than or equal to 35,000 lb/ft <sup>2</sup> at the edge of the nuclear island at its excavation depth	190,000 to 285,000 lb/ft <sup>2</sup>	Subsection 2.5.4.10.1	Yes
Shear Wave Velocity	Greater than or equal to 1,000 ft/sec based on low-strain best-estimate soil properties over the footprint of the nuclear island at its excavation depth	9000 to 10,000 ft/sec	Subsection 2.5.4.7	Yes
Lateral Variability	Soils supporting the nuclear island should not have extreme variations in the subgrade stiffness  Case 1: For a layer with a low strain shear wave velocity greater than or equal to 2500 feet per second, the layer should have approximately uniform thickness, should have a dip not greater than 20 degrees, and should have less than 20 percent variation in the shear wave velocity from the average velocity in any layer.	Case 1 applies. Non-dipping meta-plutonic rock displaying less than 20 percent variation in the shear wave velocity.	Subsection 2.5.4.7.4	Yes
Liquefaction Potential	None	None. Category I structures are founded on hard rock.	Subsection 2.5.4.8	Yes
Fault Displacement Potential	Negligible	Negligible.	Subsection 2.5.3.8	Yes

## Comparison of Lee Site Characteristics to AP1000 (continued)

- Ground Motion Response Spectrum (GMRS) and Unit 1 Foundation Input Response Spectrum (FIRS) are below AP1000 hard rock high frequency (HRHF) spectrum
- FSAR 2.5.2 develops GMRS and Unit 1 FIRS
- FSAR 3.7.1 compares GMRS and Unit 1 FIRS to AP1000 criteria
- Figure 3.7-201 (horizontal) and Figure 3.7-202 (vertical) (next slide) illustrate the comparison

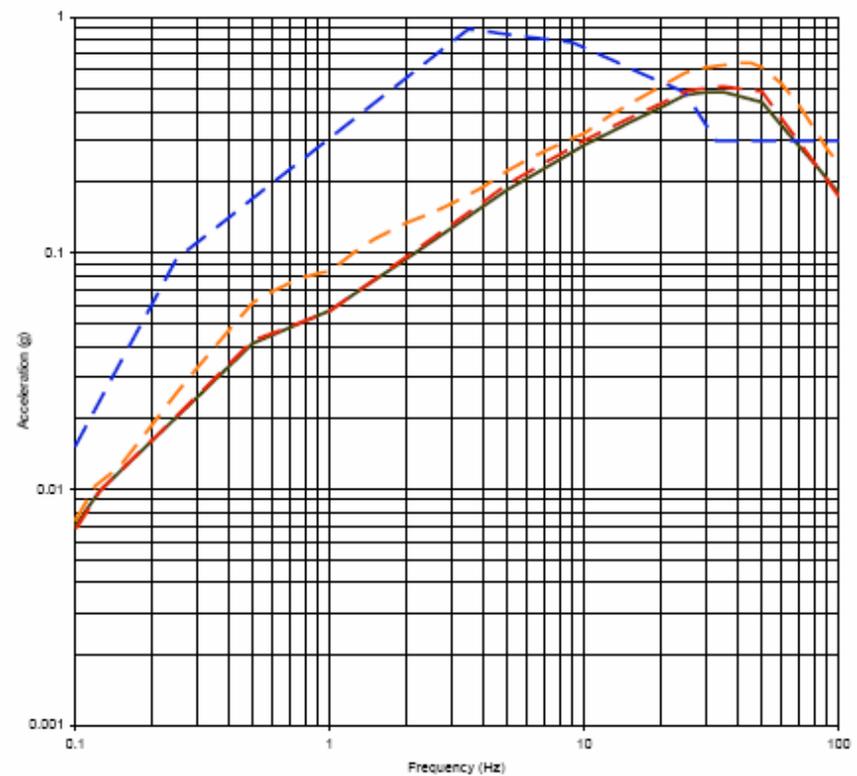
	AP 1000 DCD Site Parameters	WLS Site Characteristic	WLS FSAR Reference	WLS Within Site Parameter
<b>Seismic</b>				
SSE	SSE free field peak ground acceleration of 0.30 g with modified Regulatory Guide 1.60 response spectra. Seismic input is defined at finished grade, except for sites where the nuclear island is founded on hard rock. <sup>(d)</sup> The hard rock high frequency (HRHF) GMRS provides an alternative set of spectra for evaluation of site specific GMRS. A site is acceptable if its site-specific GMRS fall within the AP1000 HRHF GMRS. <sup>(e)</sup>	GMRS PGA = 0.21g Unit 1 FIRS PGA = 0.24 g GMRS and Unit 1 FIRS are below the WEC hard rock high frequency spectrum at all points.	Subsection 2.5.2.6 Subsection 2.5.2.7 Subsection 3.7.1.1.1 Figure 3.7-201 Figure 3.7-202	Yes

# Comparison of Lee Site Characteristics to AP1000



- Explanation**
- CSDRS Horizontal
  - WEC Generic Hard Rock Horizontal
  - WLS GMRS Horizontal
  - WLS Unit 1 FIRS Horizontal

**Horizontal**  
FSAR Figure 3.7-201



- Explanation**
- CSDRS Vertical
  - WEC Generic Hard Rock Vertical
  - WLS GMRS Vertical
  - WLS Unit 1 FIRS Vertical

**Vertical**  
FSAR Figure 3.7-202

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## Aircraft Hazard Evaluation

- One federal low altitude airway (V54) is located within 4 miles of the Lee site
- V54 runs between Spartanburg Downtown Memorial Airport (SPA) and Charlotte Douglas International Airport (CLT), and is used by light general aviation aircraft
- SPA is a small airport (eight permanent employees) and should not be confused with GSP, Greenville-Spartanburg International Airport
- FSAR Section 3.5.1.6 describes analyses demonstrating that aircraft impact with safety-related structures is highly unlikely

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## Conclusion about Site Characteristics

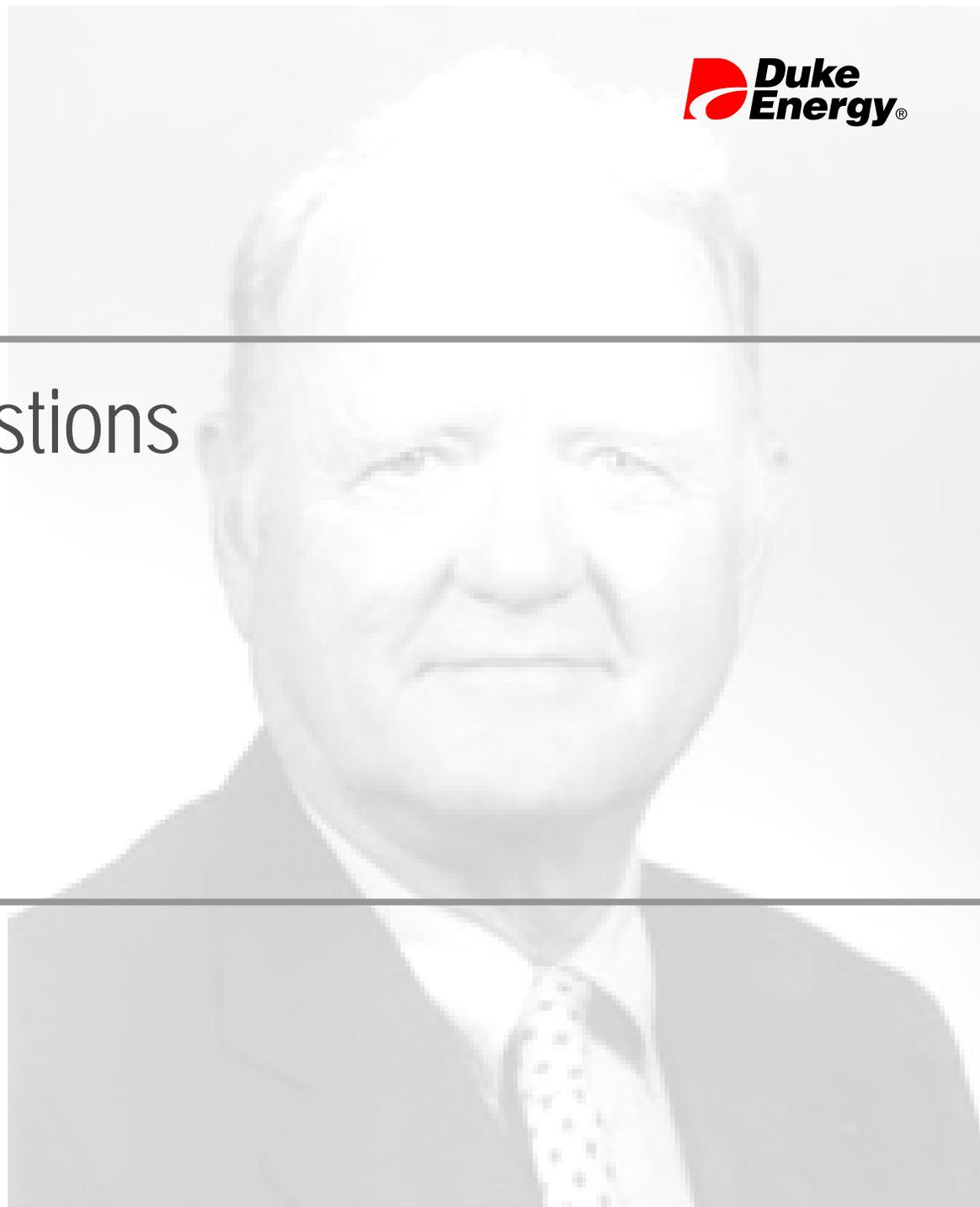
- The characteristics of the Lee Nuclear Station site demonstrate that the site is acceptable for deployment of AP1000 standard plant designs



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# Comments/Questions

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Lee Nuclear

Environmental Report  
Overview

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## Environmental Report – Approach and Assumptions

- Detailed environmental characterization performed during the 1970's for the original Cherokee Nuclear Station Environmental Impact Statement
- 2006 environmental characterization focused on:
  - Confirming that 1970's characterization still valid
  - Supplementing information not obtained in 1970's characterization
- Bulk of environmental impact to site was exerted as part of the construction of Cherokee Nuclear Station

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## Environmental Report - Organization

- Chapter 1
  - Provides introduction, defines major federal action and defines scope of Environmental Report
  - Provides brief description of the proposed project
  - Provides status of environmental permits that have been or will be obtained
- Chapter 2
  - Provides description of existing environment
  - Ties 1970's characterization and 2006 characterization
  - Confirms that overall ecology has not changed

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## Environmental Report – Organization (Continued)

- Chapter 3
  - Describes plant systems important to environment
  - Relies on DCD descriptions and FSAR descriptions of systems
- Chapter 4
  - Describes activities and environmental protection performed during demolition of legacy structures
  - Projects potential impacts resulting from site preparation and construction and potential mitigations

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## Environmental Report – Organization (Continued)

- Chapter 5
  - Projects potential impacts resulting from operations and potential mitigations
- Chapter 6
  - Describes pre-application, site preparation and construction, pre-operation, and operation environmental monitoring programs
  - Proposed monitoring is commensurate with projected impacts

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## Environmental Report – Organization (Continued)

- Chapter 7
  - Projects environmental impacts from postulated accidents
  - References accident analyses from DCD and FSAR
- Chapter 8
  - Provides discussion of need for proposed action
  - Provides summary of Duke Energy 2007 Integrated Resource Plan

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## Environmental Report – Organization (Continued)

- Chapter 9
  - Discusses various alternatives to proposed action
  - Summarizes energy alternatives discussion from Duke Energy 2007 Integrated Resource Plan
  - Summarizes site selection process
  - Compares the proposed site to three alternate sites
  - Summarizes transmission corridor selection report
- Chapter 10
  - Summarizes environmental impacts and costs-benefits

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## Environmental Report – Significant Facts

- No rare, threatened or endangered species in the site vicinity
  - Plant of special state concern (southern adder's tongue fern, *Ophioglossum vulgatum*) observed in backwoods, well outside impact area
  - Mussel of special state concern (paper pondshell, *Utterbackia imbecillis*) observed in Make-Up Pond A
- No NRHP eligible sites within the project boundary
  - Closest NRHP eligible site is Ninety-Nine Islands Hydroelectric Station and dam

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## Environmental Report – Significant Facts (Continued)

- Lee Nuclear Station will withdraw 3% of mean annual flow of Broad River
  - Onsite ponds provide supplemental water during low-flow
- Discharge of cooling tower blowdown and process wastewater into penstocks of hydro-electric station on Broad River ensures complete mixing downstream
  - Maximum delta temperature of 1.7° F
  - Minimal impact of discharges
- Groundwater not used for construction or operation
- Groundwater flow is toward Broad River, no offsite wells within influence of plant

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## Environmental Report – Significant Facts (Continued)

- In-migration of workers based on experience with large construction projects in Southeast and practices at other Duke Energy sites
- In-migrating workers assumed to settle in Cherokee and York Counties
  - Cherokee and York Counties represent 90% of plant EPZ
  - Conservatively maximizes socioeconomic impacts to these two counties



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# Comments/Questions

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