



April Rice  
Manager  
Nuclear Licensing

August 20, 2015  
NND-15-0515  
10 CFR 2.390

ATTN: Document Control Desk  
U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555

Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3  
Combined License Nos. NPF-93 and NPF-94  
Docket Nos. 52-027 & 52-028

Subject: Phase II Licensee Assessment of AP1000® Enhanced Shield Building Design  
for Licensing Basis Compliance

In preparation for the upcoming August 27, 2015 Public meeting to discuss the Phase II Licensee Assessment of AP1000® Enhanced Shield Building Design for Licensing Basis Compliance, SCE&G has enclosed herein the presentations, which will be discussed during the meeting.

Enclosure 1 contains the Public Session Presentation, and Enclosure 2 contains the Closed Session Presentation. **Enclosure 2 contains Security-Related Information and accordingly is requested to be withheld from public disclosure under 10 CFR 2.390.**

This letter contains no regulatory commitments.

Should you have any questions, please contact Mr. Justin Bouknight, Supervisor, Nuclear Licensing, at (803) 941-9828.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 20<sup>th</sup> day of August, 2015.

Sincerely,

April Rice  
Manager  
Nuclear Licensing

MMD/ARR/mmd

Enclosure 1: Public Session – Phase II Licensee Assessment of AP1000® Enhanced Shield Building Design for Licensing Basis Compliance

Enclosure 2: Closed Session – Phase II Licensee Assessment of AP1000® Enhanced Shield Building Design for Licensing Basis Compliance **(Security-Related Information)**

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**South Carolina Electric and Gas Company  
Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3**

NND-15-0515

Enclosure 1

Public Session - Phase II Licensee Assessment of  
AP1000® Enhanced Shield Building Design for  
Licensing Basis Compliance



## Public Session with U.S. NRC

# Phase 2 Licensee Assessment of AP1000<sup>®</sup> Enhanced Shield Building Design for Licensing Basis Compliance

August 27, 2015

# Presentation Topics

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- I. Vendor Oversight Process
- II. High-Level Summary: Shield Building Assessment Results Affecting License
  - A. Scope of Phase 2 Assessment
  - B. Assessment Results



# Vendor Oversight Process

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- Joint effort (Consortium/SCE&G/SNC)
- Systematic approach
  - Focus area selection
  - Licensing basis compliance
- Completed assessments
- Next assessments
- Results of the process to date



# Vendor Oversight Process

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## ➤ Shield Building Phase 2 Assessment

- Experienced team (>90 years)
- Preparation for inspection
- Inspection
- Results





# High-Level Summary

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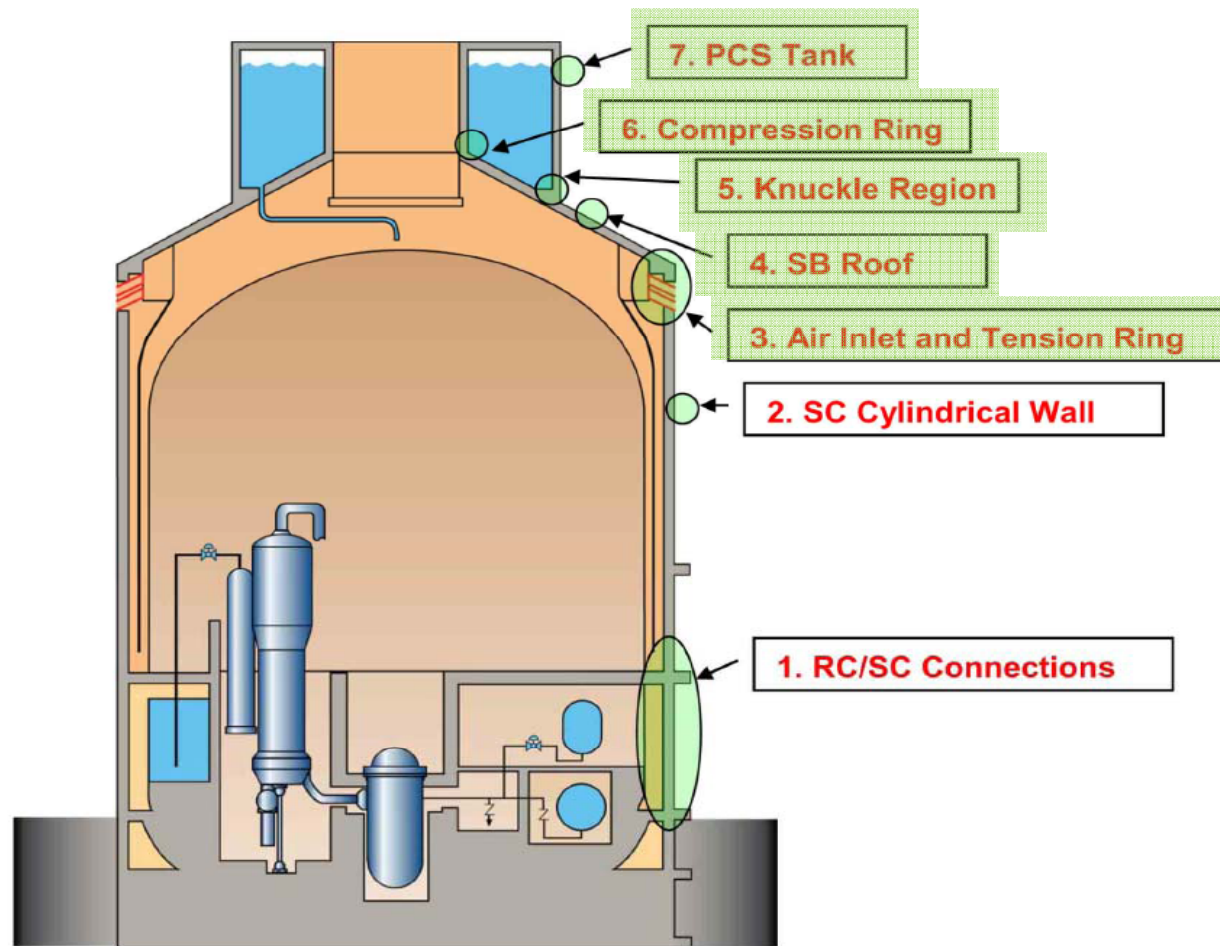
## Scope of Phase 2 Assessment

- February 23-27, 2015 - Phase 2 Assessment:
  - Air Inlet Structure (AIS) - Elev. ~ 251' to 266'
  - Tension Ring- Elev. ~ 266' to 274'
  - SB Roof (Including Knuckle Region and Compression Ring) - Elev. ~ 271' – 305'
  - Passive Containment Cooling Water Storage Tank (PCCWST) – Above Elev. ~ 294'
- Documents Reviewed:
  - Design Calculations, Drawings, DCPs, and E&DCRs



# High-Level Summary

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# High-Level Summary

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## Phase 2 Assessment Results

- 41 Requests for Information Generated
- 10 Licensing Basis Discrepancies
  - All impacts are to Appendix 3H Tables (6) and Figures (4)
  - No discrepancies related to the structural analyses or design methodologies described in the license text
- 9 Design Basis Documentation Issues
  - No physical design changes are expected
- All Issues are documented in Westinghouse and Licensee's Corrective Action Program



# Example of Impacted Appendix 3H Table

Table 3H.5-9 (Sheet 1 of 3)  
Shield Building Roof Reinforcement Summary  
(Tension Ring)

Tension Ring – Axial Force and Bending Verification								
Location		Seismic Maximum Stresses		Maximum Stresses ksi	F <sub>y</sub> ksi	Maximum Steel Area Required <sup>(2)</sup> (in <sup>2</sup> /ft)	[Steel Area Provided]*	[Design Limit <sup>(1)</sup> for Ratio Max Required/Provided]*
Section	Angles	Seismic L/C	f <sub>a</sub> ksi					
2 lower	5.625°	9	14.31	14.31	50	7.74	[Liner 1 1/2" = 18 (in <sup>2</sup> /ft) (Min.)]*	[0.43 + 2%]*
	84.375°	17	12.52					
1 lower	0°	9	12.97					
	90°	17	11.39					
Tension Ring – Shear Force and Torsion Verification								
Location		Seismic Maximum Stresses		Maximum Stresses ksi	F <sub>y</sub> ksi	Maximum Steel Area Required <sup>(2)</sup> (in <sup>2</sup> /ft)	[Steel Area Provided]*	[Design Limit for Ratio Max Required/Provided]*
Section	Angles	Seismic L/C	f <sub>v</sub> ksi					
2 lower	5.625°	17	4.83	5.52	50	5.04	[Liner 1 1/2" = 18 (in <sup>2</sup> /ft) (Min.)]*	[0.28 + 2%]*
	84.375°	9	5.52					
1 lower	0°	18	3.20					
	90°	11	4.00					

**Notes:**

- [Two percent of the value may be added to the design limit as an allowance for minor variances in analysis results.]\*
- Thermal loads have been considered in the design of critical sections. The required reinforcement values shown do not include the load case where seismic and normal thermal loads are numerically combined as the normal thermal loads were assessed to be insignificant. When the seismic and normal thermal loads are numerically combined, the value of required reinforcement may increase; however, in all cases the required reinforcement is less than the provided reinforcement and thus the design of the critical section reinforcement is acceptable.

- Max Steel Area Required increased from 7.74 in<sup>2</sup>/ft to 9.21 in<sup>2</sup>/ft
- Design Limit for Ratio of Max Required/Provided increased from 0.43 to 0.51, exceeding the 2% analysis allowance

# Next Steps

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## LAR-74 (Submittal Planned - 4Q 2016)

- Will incorporate impacts from Phase 2 Assessment
- LAR-74 currently proposes:
  - Changes to reinforcement configuration in the roof (DCP APP-GW-GEE-4952)
  - Changing conical roof beams from W36x393 to W36x395 (DCP APP-GW-GEE-4625)



# Acronym List

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DCP:	Design Change Proposal
E&DCR:	Engineering and Design Coordination Report
LAR:	License Amendment Request
PCS:	Passive Containment Cooling System
RC:	Reinforced Concrete
SC:	Steel & Concrete Composite