Case Study of V.C. Summer 2 & 3

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Project Overview

- **Owned by two South Carolina utilities**
  - South Carolina Electric and Gas (SCE&G)
  - South Carolina Public Service Authority ("Santee Cooper")

- **Two Westinghouse AP1000 reactors**
  - Consortium with Westinghouse and CB&I (formerly Chicago Bridge and Iron)

- **Expansion of an existing nuclear plant**
  - V.C. Summer Unit 1 is a 966 MW PWR licensed through 2042
Westinghouse AP1000

Received Final NRC Design Certification December 2011
AP1000 Modular Construction
Ownership Structure

SCE&G is the majority owner and operator
- Wholly-owned subsidiary of SCANA, an investor-owned utility company
- Vertically-integrated utility for part of South Carolina
- Owns 55% of V.C. Summer 2 & 3, and has agreed to purchase an additional 5% of the project
- Owns two-thirds of V.C. Summer 1; operates the reactor

Santee Cooper
- State-owned utility
- Minority owner of both V.C. Summer projects
SCE&G’s 55% Share of Total Project Costs (Includes AFUDC, Transmission and Escalation)

Note: Reflects nuclear capex as filed February 2014 in BLRA Quarterly Report
* SCE&G’s additional 5% ownership interest in the New Nuclear project does not impact the BLRA Projected Cost Calculation
Evolution of Cost Forecasts

New Nuclear Projected Costs (in billions)

New Nuclear Total Projected Costs (SCE&G 55% Share)*


$6.875  $6.313  $5.787  $5.755  $5.651  ~$633M

$5.680M

Capital Cost, 2007 Dollars  AFUDC  Escalation

Note: Reflects new nuclear projected costs as filed February 2014 in BLRA Quarterly Report; SCE&G 55% share
* SCE&G’s additional 5% ownership interest in the new nuclear project does not impact the BLRA projected cost calculation
Financing

- Expectation is that costs will be met via earnings, corporate debt and additional equity sales
  - Debt: average maturity 18 years at a rate of 5.74%
    - Sold $400 million in 30 year bonds at 4.6% in June 2013
  - Equity: raised almost $300 million through stock purchase plans and new issuances
    - Expect to continue these approaches during construction
  - Have not sought a loan guarantee from DOE

- SCE&G is allowed to file for rate increases annually to cover the financing costs incurred during the year
Credit Rankings for Owners

SCE&G
Santee Cooper

Aaa
Aa1
Aa2
Aa3
A1
A2
A3
Baa1
Baa2
Baa3
Ba1
Ba2
Ba3
B1
B2
B3
Caa1
Caa2
Caa3
Ca
C

Schedule

Nuclear Energy

- Original schedule “Substantial Completion”:
  - Unit 2: April 1, 2016
  - Unit 3: January 1, 2019

- Agreement with state regulators includes an 18 month contingency

- Original schedule expected COL from NRC by July 2011, actually received March 2012

- Current schedule:
  - Unit 2: Q4 2017 – Q1 2018
  - Unit 3: Q4 2018 – Q1 2019
Contractor Responsibilities

Westinghouse

- Overall Consortium responsibility
- AP1000 design authority - design, licensing, integration, configuration management, change control, and basic plant design
- Detailed design of 32 systems and containment and auxiliary buildings
- Procurement of major components and startup support for nuclear systems

CBI

- Detailed design of 29 balance-of-plant systems, site-specific systems, and the annex, radioactive waste and diesel generator buildings
- Design and construction of containment vessel
- Fabrication of structural and mechanical modules as well as piping systems
- Procurement of commodities and selected equipment
- Site specific design, construction and startup support
Supply Chain

Map of supply chain locations around the world, including:
- ASME Section VIII: Tanks, Dimineralizers, Detroit, MI
- Aux. Relief Valves: Brandon, Ontario
- Recirculation Heaters: Pittsburgh, PA
- Solenoid Valves: Pittsburgh, PA
- Variable Frequency Drives: New Kensington, PA
- Squib Valves: McKean, PA
- Reactor Coolant Pumps: Cheswick, PA
- Liquid Ring Vacuum Pump: Pittsburgh, PA
- Polar, Cask Handling: Rail Car Bay Cranes, Shoreview, MN
- Integrated Hood Package: Blackfoot, ID
- Pumps: Brea, CA
- Valves: Rancho Santa Margarita, CA
- Cooling Tower Fans: Sao Paulo, Brazil
- Instrumentation Valves: Solon, OH
- Air Operated Pump: Mansfield, OH
- Reactor Vessel and Steam Generators: Changwon, S. Korea
- Accumulators, Core Make-up Tanks, PRHR Hz, Pressurizer: San Giorgio di Nogaro, Italy
- Dehmineralizer and Heat Exchangers: Ansan-City, S. Korea
- Valves: Cheonan, S. Korea
- RCL Piping: Milan, Italy
- Condenser: Sacheon S. Korea
- Turbine Generator, Transformer: Tokyo, Japan
- Containment Vessel: Yokohama, Japan

Locations include modules: Lake Charles, LA.
Challenges

Delays delivering sub-modules from Lake Charles CB&I facility
- Quality control issues resulted in sizable delays for key modules (CA20, CA01)
- Work has been shifted from Lake Charles to the module assembly facility on site and to a different firm in South Carolina
- Caused a schedule delay and about $200 in increased costs (prelim.)
- Allocation of these costs not yet determined

Squib valves delivery delayed
- Quality control management issues

Rebar for nuclear island basemat
- NRC inspectors determined that the spacing and depth of rebar was not in alignment with design certification document
- Subsequent analysis required to prior to approval to proceed
- About a six month delay
SCE&G entered into an Engineering Procurement and Construction (EPC) contract with Westinghouse and CB&I

- Received approval to enter into contract in March 2009
- Contract approved in October 2011

Risk allocation

- Seven cost categories: four fixed/categories, three variable based on actual costs
- About two-thirds of the costs are either “fixed or firm” with escalation
- Escalation indices set by regulatory agreement

Dispute resolution

- Contract included formal and informal resolution methods
Major Milestones

- Unit 2 First Nuclear Concrete March 2013
- Unit 3 First Nuclear Concrete November 2013
- Major modules installed in Unit 2
Site Layout (1)

Total site area: ~10.4 sq. km (2,560 acres)
Tentative Conclusions

- Strong state support making financial burden manageable

- Supply chain and regulatory interactions have created challenges that have resulted in delays

- Flexible authorities (schedule) and contracting approach (dispute resolution) keeping project moving forward