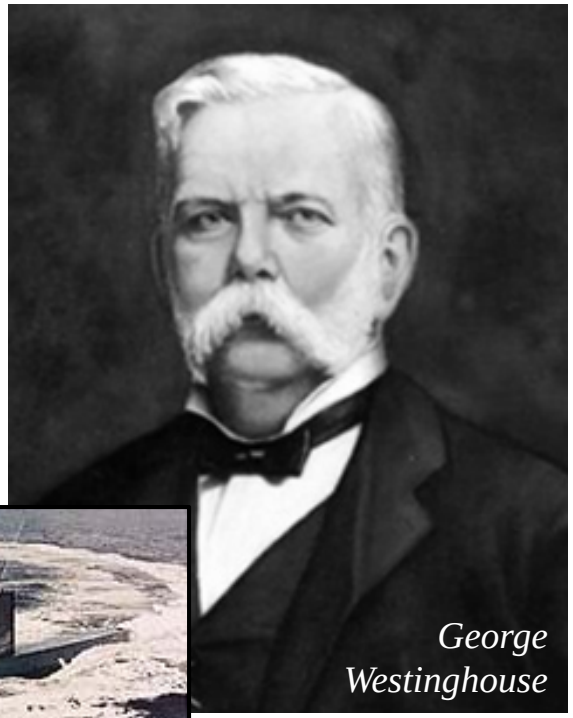
Westinghouse Overview and AP1000® Plant Projects Update

October 2013

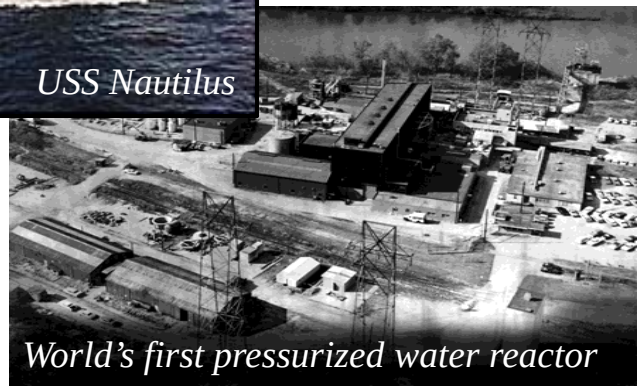
Westinghouse

Westinghouse Electric Company

- Incorporated in 1886 by George Westinghouse
- Responsible for some of the world's most important achievements:
  - AC technology
  - 1st commercial radio broadcast
  - USS Nautilus
  - 1st camera on the moon
  - **Commercial nuclear power**


George Westinghouse


USS Nautilus


World's first pressurized water reactor

Westinghouse

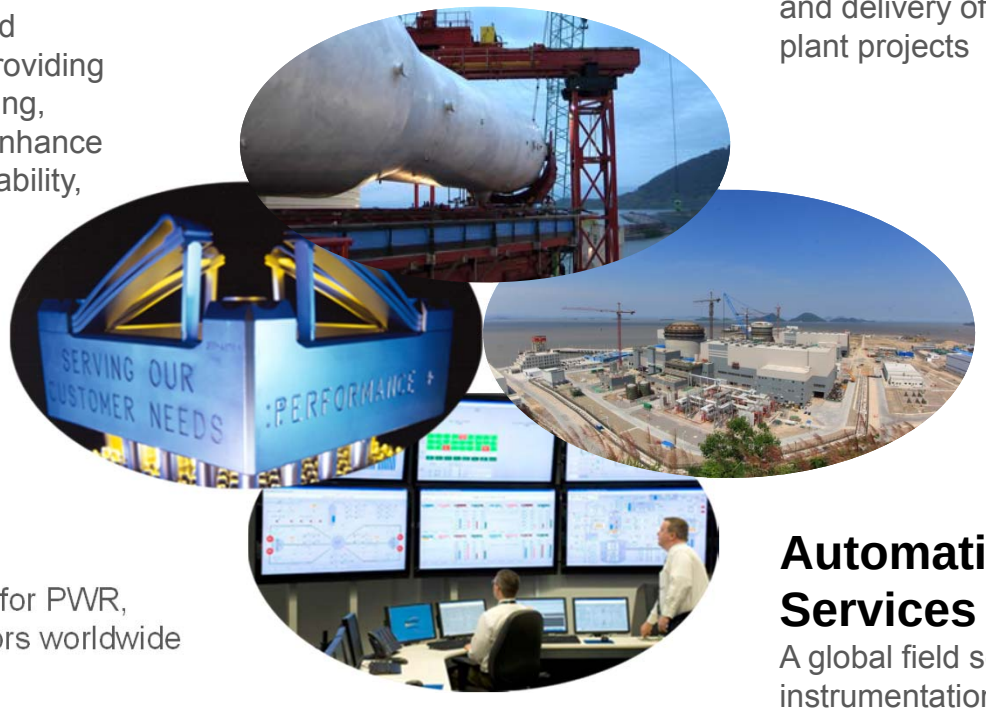
Westinghouse Electric Company Business Structure

Engineering, Equipment and Major Projects

Focused on ensuring new and operating plant success by providing technically superior engineering, hardware and services that enhance plant safety, ensure plant reliability, extend plant life and improve plant performance

Nuclear Power Plants

Specializing in the development and delivery of new nuclear power plant projects



Nuclear Fuel

A single-source fuel provider for PWR, BWR, VVER and AGR reactors worldwide

Automation and Field Services

A global field services and instrumentation and control solutions provider, focused on delivering industry-leading operations solutions and better outage services worldwide

Westinghouse

Westinghouse Locations

Westinghouse

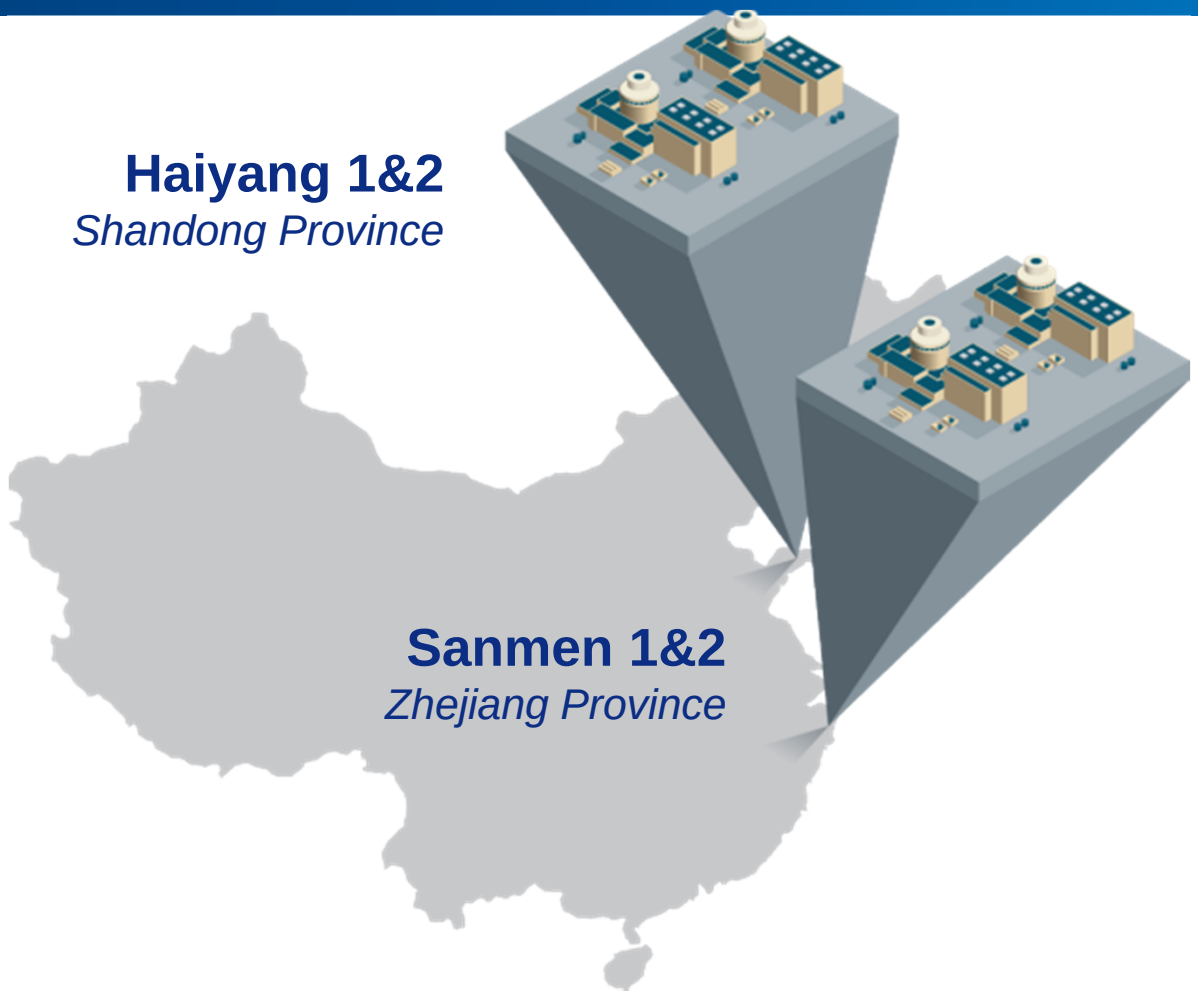
60+ sites worldwide!

AP1000 Plant Global Project Delivery

- Eight **AP1000** units under construction worldwide
  - Four units in China
  - Four units in the United States

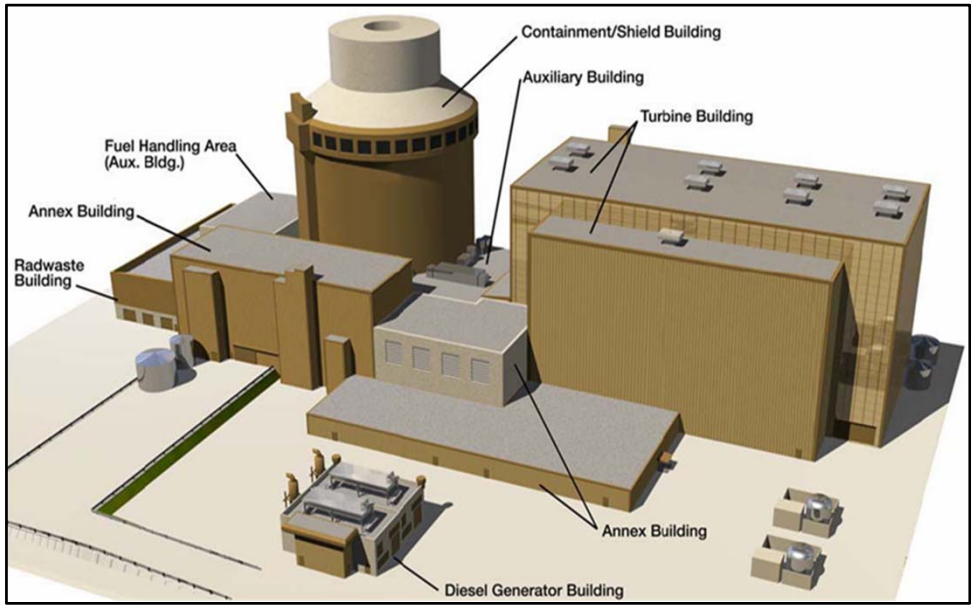
Westinghouse

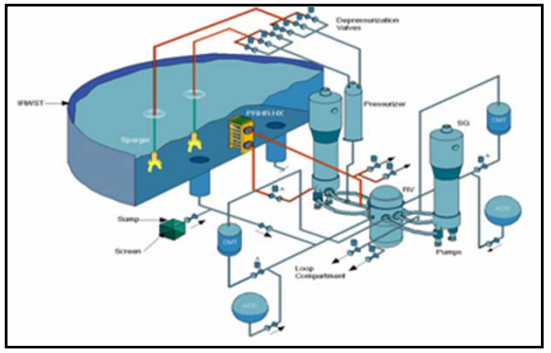
China **AP1000** Plant Projects



Westinghouse

First Build of a New Standard Advanced Passive Generation III+ Plant

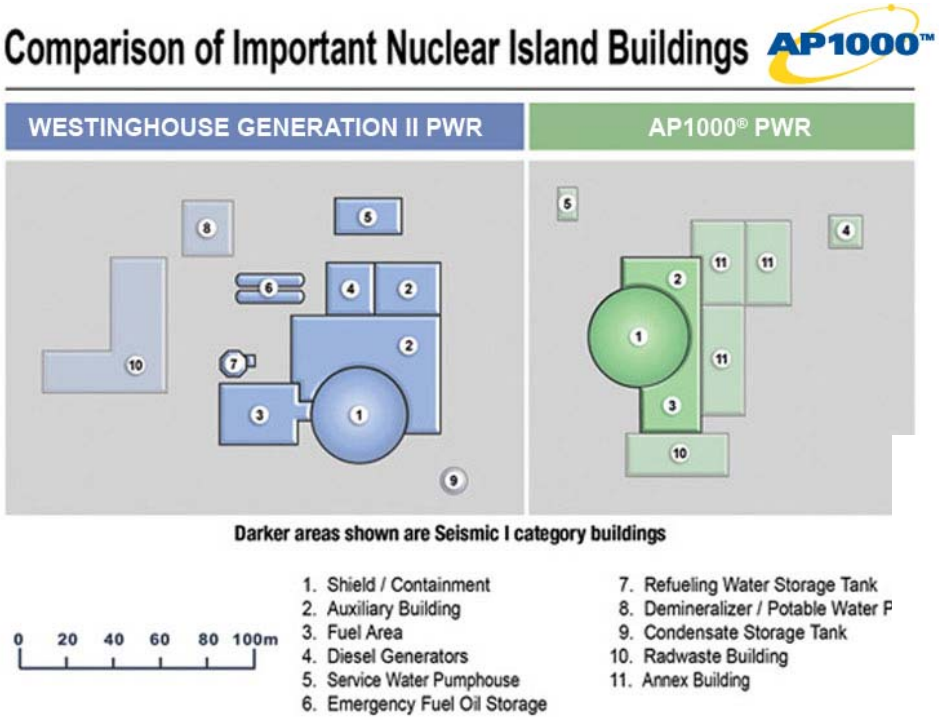


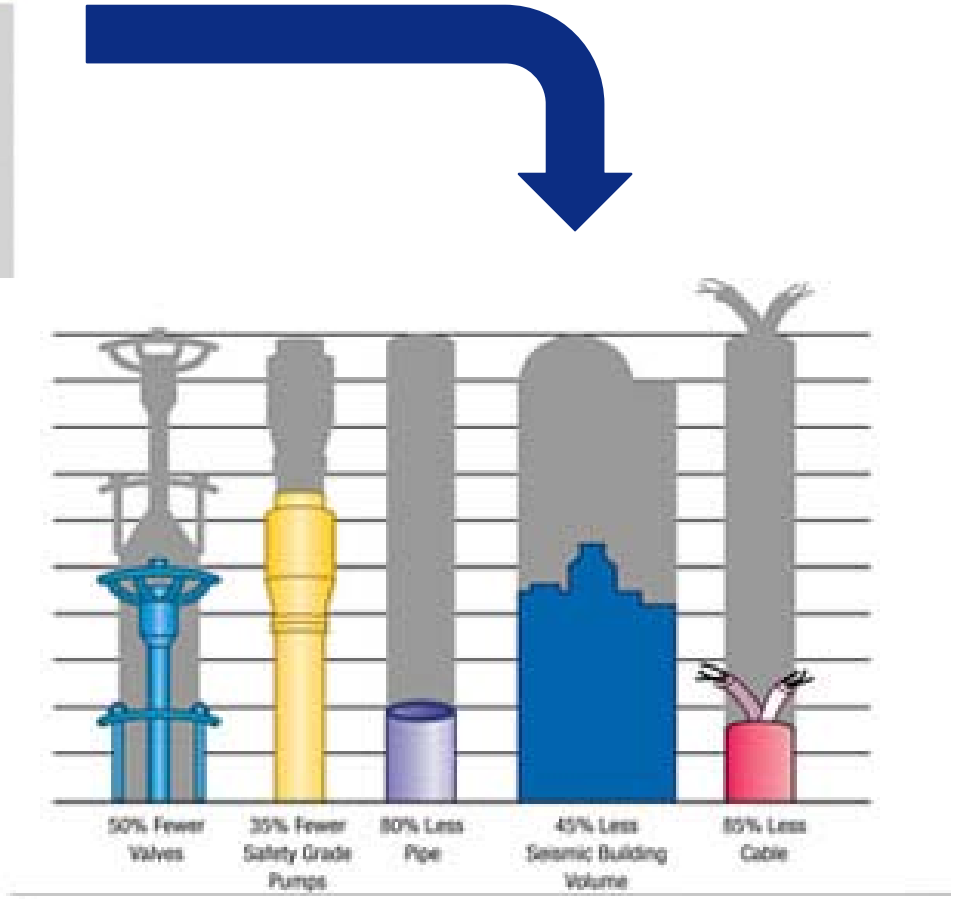


Passive safety features

The concept of standardized plants for China supports the country's fleet approach, aligns with the technology transfer principles and assists supply chain.

AP1000 – Simplified PWR Design

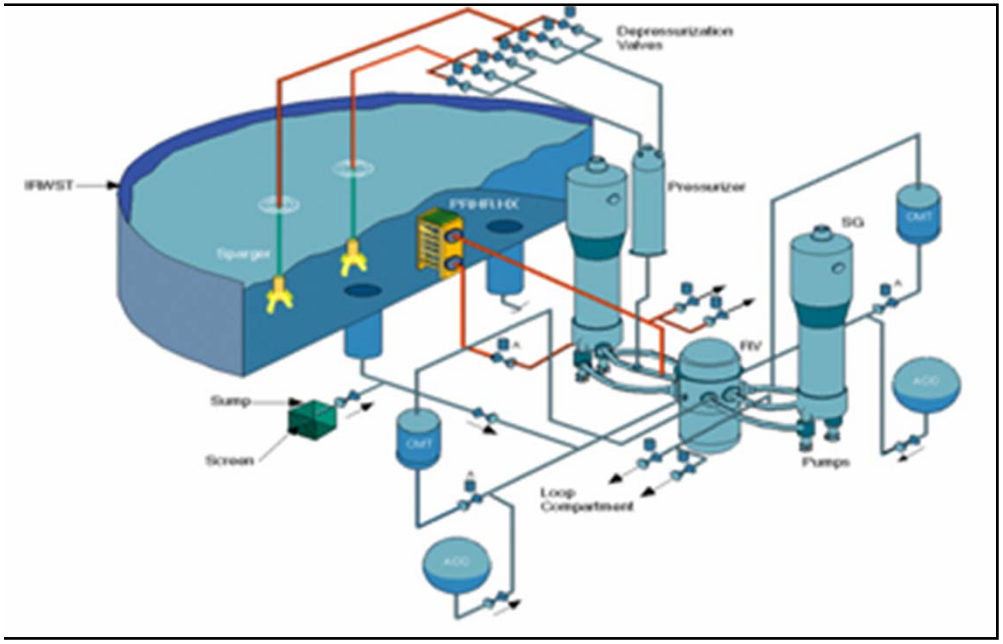


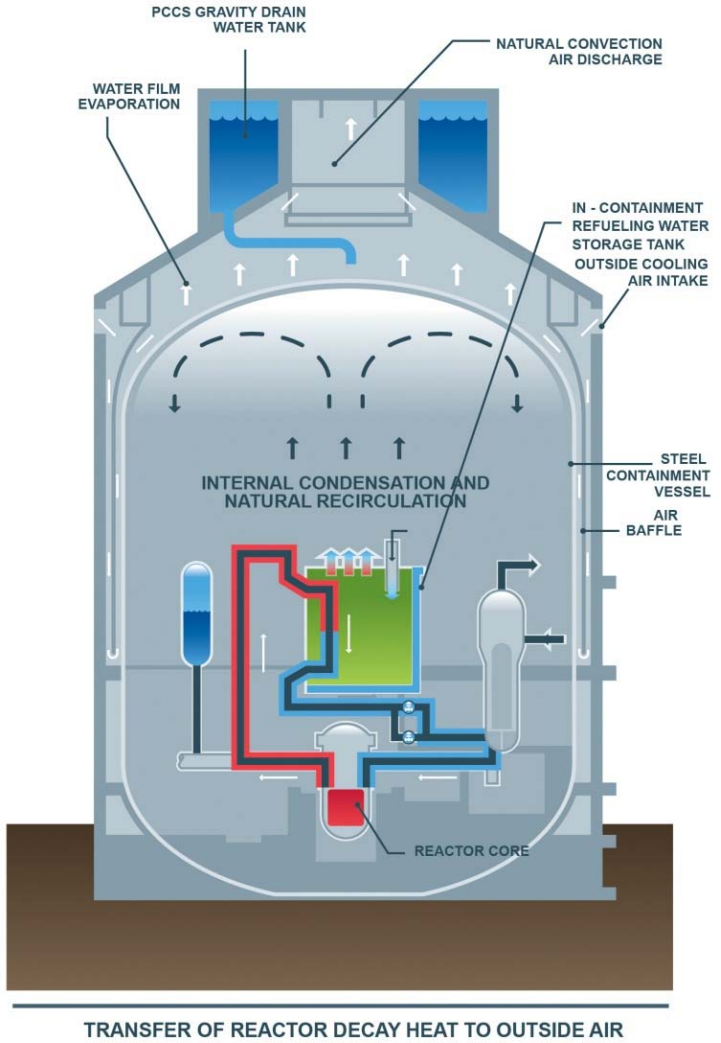


~45% less Seismic Category 1 building volume

Westinghouse

AP1000 – Station Black Out





TRANSFER OF REACTOR DECAY HEAT TO OUTSIDE AIR

Westinghouse

China **AP1000** Plant Progress: Sanmen

Unit 1 First Concrete – March 2009

Unit 2 SG/Refueling Canal Module – December 2010

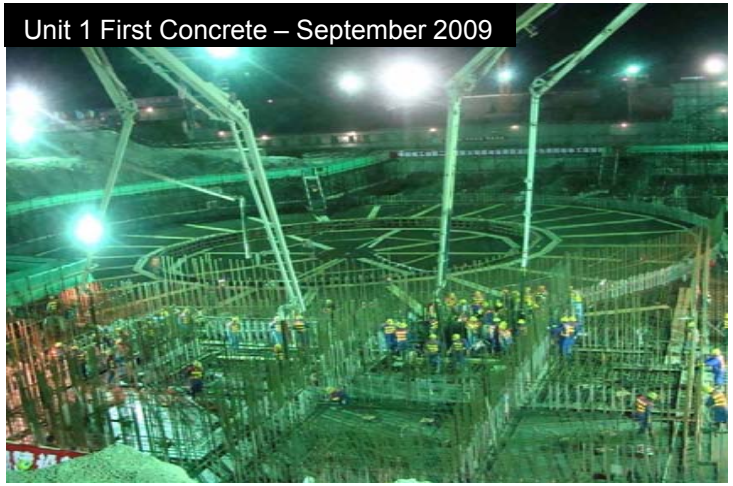
Unit 1 Reactor Vessel – August 2011

Unit 1 CVTH Set – January 2013

Westinghouse

China **AP1000** Plant Progress: Haiyang

Unit 1 First Concrete – September 2009



Unit 2 Auxiliary Building – December 2010

Unit 1 Reactor Vessel – January 2012

Unit 1 CVTH Set – March 2013

Westinghouse

Progress of China Projects: Summary

- Major equipment delivered and installed at Sanmen Unit 1 and Haiyang Unit 1 includes:
  - Reactor Vessel
  - Steam Generators
  - Reactor Vessel Internals
  - Polar Crane
  - Integrated Head Package
- Containment Vessel Top Head (CVTH) set at Sanmen Unit 1 in January 2013 and Haiyang Unit 1 in March 2013
- Digital I&C turnover to Startup staff in progress
- Potential Sanmen operators have completed simulator training; Haiyang operators started simulator training in July
- Technology transfer well advanced

Sanmen Site – August 2013

Photo © Sanmen Nuclear Power Company, Ltd. All rights reserved.

Haiyang Site – June 2013

Photo © Shandong Nuclear Power Company, Ltd. All rights reserved.

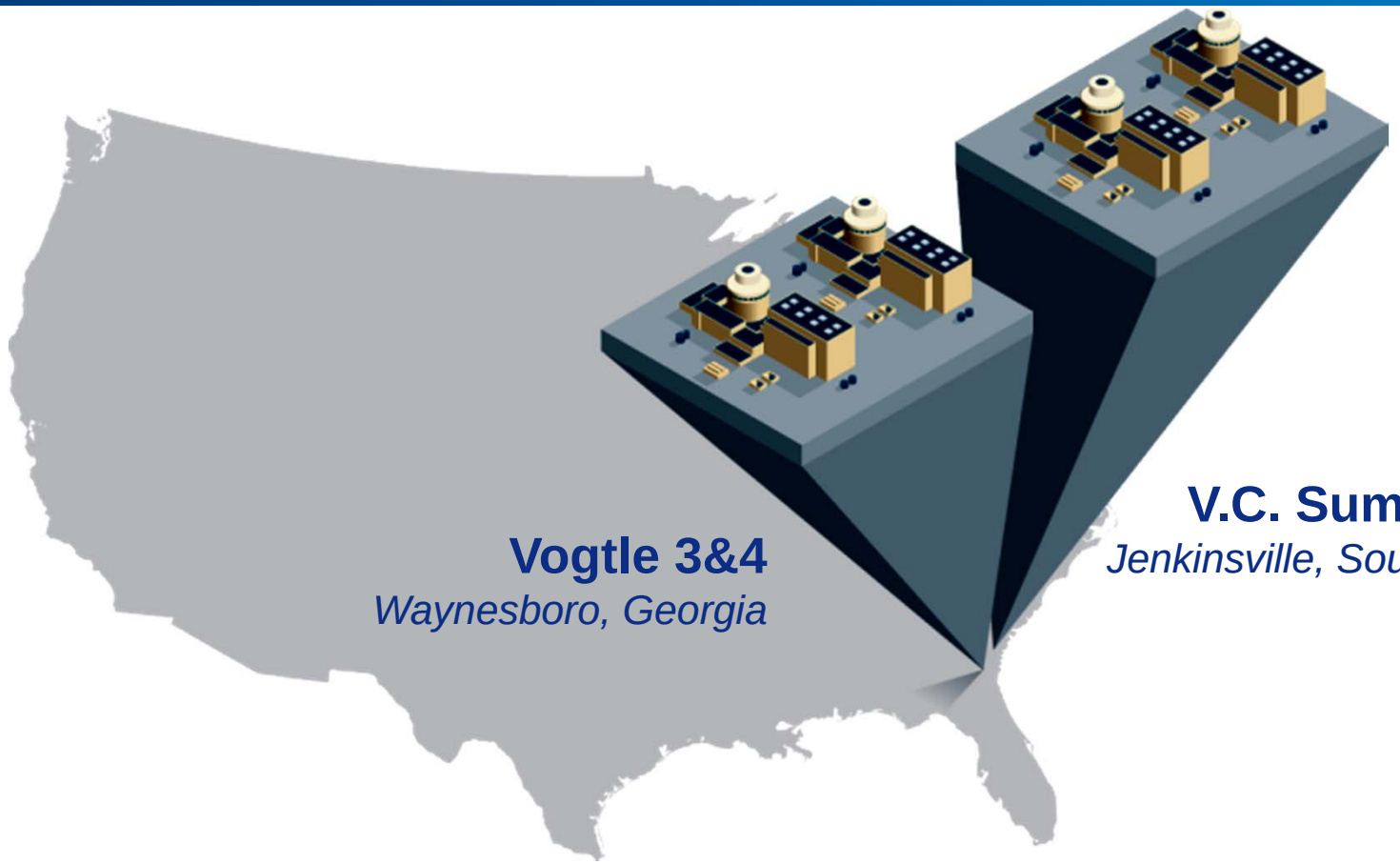
Westinghouse

Sanmen Site Progress: Time Lapse View

2009 to 2013

Westinghouse

U.S. **AP1000** Plant Projects



Vogtle 3&4
Waynesboro, Georgia

V.C. Summer 2&3
Jenkinsville, South Carolina

Westinghouse

AP1000 U.S. Design & Licensing Milestones

- U.S. Nuclear Regulatory Commission (NRC) approved amended design in December 2011 in 5-0 vote
- Combined construction and operating licenses (COLs) issued by U.S. NRC in February 2012 for Vogtle 3&4 site and March 2012 for V.C. Summer 2&3 site

U.S. **AP1000** Plant Progress: Vogtle Site

- First nuclear concrete pour for Vogtle Unit 3 completed March 2013
- Unit 3 Containment Vessel Bottom Head (CVBH) set in Nuclear Island June 2013
- Seam welding of Unit 3 Containment Vessel lower and middle rings in progress
- Assembly of Unit 3 Condensers ongoing
- Units 3&4 Cooling Tower erection, permanent buildings and River Water Intake piping placement work ongoing
- Component and module fabrication proceeding

Unit 3 CVBH Set – June 2013

Unit 3 CA20 Module Assembly – September 2013

Westinghouse

U.S. **AP1000** Plant Progress: Vogtle Site

- Welding of first Shield Building panel commenced January 2013
- Unit 3 Reactor Vessel delivered April 2013
- First phase of backfill completed for Unit 3 Cooling Tower, Hot Water Intake and Circulating Water System piping to pumphouse
- Unit 3&4 Inspections, Tests, Analyses and Acceptance Criteria (ITAAC) continue to be submitted to NRC for review
- Unit 4 CVBH assembly near completion
- Unit 3 Auxiliary Building concrete wall placements ongoing

Unit 3 Lower CV Ring – August 2013

Unit 3 Turbine Building – August 2013

Westinghouse

U.S. **AP1000** Plant Progress: V.C. Summer Site

- First nuclear concrete pour for V.C. Summer Unit 2 completed March 2013
- Unit 2 Containment Vessel Bottom Head (CVBH) set in Nuclear Island May 2013
- Unit 2 Reactor Vessel delivered June 2013
- First Westinghouse-procured equipment installed in Unit 2 Turbine Building
- Unit 2 CA20 Module (Auxiliary Building) assembly continues at site

Unit 2 First Concrete Pour – March 2013

Unit 2 CVBH Set – May 2013

Westinghouse

U.S. **AP1000** Plant Progress: V.C. Summer Site

- First concrete pours for Unit 2 Auxiliary Building walls and CVBH completed August 2013
- CH80 structural frame module set in Unit 2 Turbine Building September 2013
- Unit 2 Condenser B lower shell installed in Turbine Building
- Shield Building panel fabrication in progress
- Unit 3 basemat rebar and embedded piping installation in progress

Unit 2 Reactor Vessel Delivery – June 2013

CH80 Module Lift – September 2013

Westinghouse

Future AP1000 Projects

- US – Duke recently canceled due to NRC delays on issuing COLs.
- China – multiple units being planned for construction; eight additional to start this year.
- India – a preliminary commercial agreement was just signed with NPCIL for early engineering and licensing work.
- United Kingdom – currently certifying AP1000 design.
- Czech Republic – currently bidding on two AP1000 units at the Temelin site. Bid recently received top ranking.
- Middle East – just signed a collaboration agreement with Exelon and Toshiba for Saudi Arabia projects.

Westinghouse


Thank you! Questions?