Westinghouse AP1000® Plant

Britain’s Energy Coast Business Cluster ‘BECBC’
Energus Workington
6th August, 2014

Ken Hampson
UK Supply Chain Director,
Nuclear Power Plants

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Introduction and agenda review

Toshiba and Westinghouse

AP1000 plant

UK opportunity

But First
Sanmen Site Progress: Time Lapse View

2009 to 2014
Westinghouse Electric Company

Yesterday…..
Founded in 1886 by George Westinghouse

Responsible for
  • Alternating current (AC) technology
  • Shippingport nuclear power plant (Pennsylvania, USA)

Today …..
Our ONLY business is nuclear power!

Our Owners…
Majority owner Toshiba - all owners committed to nuclear industry
Westinghouse and Toshiba

Nuclear Island (NI)

Digital Instrumentation And Control

NI Equipment

Nuclear Fuel

Construction Planning & Modularization

NI Equipment

Transmission Distribution

Turbine Island

Experience, Strength & Capability to Deliver
‘The best athletes for success’
Westinghouse Locations

60+ Sites

*Westinghouse joint venture operations
Westinghouse AP1000 Plant – UK Market Capability

Legacy Plant & Materials
Current Plants
New Build

Engineer
Licence
Build
Fuel
Service
Decommission

“One Westinghouse” Solution for the UK
Westinghouse AP1000 PWR – Pressurized Water Reactor
Westinghouse AP1000 Plant – Passive Safety Features

Passive Safety-Related Systems

- Use “passive” processes only; no active pumps, diesels ….
- One-time alignment of valves
- No support systems required after actuation
- Greatly reduced dependency on operator actions

Active Defense in Depth-Related Systems

- Reliably support normal operation
- Redundant equipment powered by onsite diesels
- Minimize challenges to passive safety systems
- Not necessary to mitigate design basis accidents

All Critical Station Blackout Response Features
FAIL SAFE
Westinghouse AP1000 Plant – Impact of Passive Systems - Layout

<table>
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<th></th>
<th>Power</th>
<th>Concrete, m3</th>
<th>Rebar, MT</th>
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<tbody>
<tr>
<td>Sizewell B</td>
<td>1188 MWe</td>
<td>520,000</td>
<td>65,000</td>
</tr>
<tr>
<td><strong>AP1000</strong></td>
<td>1117 MWe</td>
<td>&lt; 100,000</td>
<td>&lt; 12,000</td>
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Westinghouse AP1000 Plant – CA01 Structural Module

CA01 comprised of 47 Sub-Modules:

Size (N x E x Height):
92’-0” x 96’-0” x 76’-0”
[28mx29mx23m]

Dry Weight:
1,600,000 lbs. [726 Tons]
Westinghouse AP1000 Plant – CA01 Structural Module

CA01, the Steam Generator & Refueling Canal Module, was successfully set at Sanmen 1 on March 27, 2010 and at Haiyang in September 2010

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Westinghouse AP1000 Plant – CA01 Structural Module
Westinghouse AP1000 Plant – China Projects

Haiyang 1&2
Shandong Province

Sanmen 1&2
Zhejiang Province
Westinghouse AP1000 Plant – Key Learning

China project represents the first build of a First of a Kind: a significant challenge, especially for Generation 3+ unit:

- Supply chain needed to learn or relearn how to manufacture high-specification AP1000 plant safety equipment with extended lifetime
- Detail design needed to be completed, with stringent worst-case accident/seismic conditions
- Equipment qualification required with strict conditions and extended life time
- Industry needed to learn how to manufacture modules and construct the first AP1000 PWR units
Westinghouse AP1000 Plant – U.S. Projects

Vogtle 3&4
Waynesboro, Georgia

V.C. Summer 2&3
Jenkinsville, South Carolina
U.S. AP1000 Plant Progress: Vogtle Site

- Unit 3 CA20 Module Lift – March 2014
- Site Overview – February 2014
- Unit 3 Accumulator Tank Delivery – October 2013
- Unit 3 Turbine Island – October 2013

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

Unit 2 CV Ring 1 Lift – June 2014

Unit 3 First Concrete Pour – November 2013

Unit 2 Turbine Building – March 2014

Unit 2 Reactor Vessel Delivery – June 2013

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Westinghouse AP1000 Plant – New Build – Forward Programme

- FCD 2009: Sanmen 1
- FCD 2009: Haiyang 1
- FCD 2009: Sanmen 2
- FCD 2010: Haiyang 2
- FCD 2013: V.C. Summer 2
- FCD 2013: Vogtle 3
- FCD 2013: V.C. Summer 3
- FCD 2013: Vogtle 4
- FCDs 2014: Xudapu 1&2
- FCDs 2014: Lufeng 1&2
- FCDs 2015: Sanmen 3&4
- FCDs 2015: Haiyang 3&4
West Cumbria – Site Map
UK New Build Schedule

2014-2018
- GDA
- Site Licence
- Site Design
- Site Licensing
- Planning

2018
- Financial Investment decision

2018-2020
- Site Preparation

2020-2024
- Construction

2024…..
- Fuel load
- Commission
- Operate

Transaction Close
Questions?

For further information:
http://ap1000.westinghousenuclear.com/