Westinghouse Electric Company

Localizing Mature, Simple, Safe Nuclear Power

Empowering South Africa towards Nuclear Self-reliance

NIASA Empowerment Seminar, 5 Oct 2012

Bultie Nel
Content of presentation

- Westinghouse – Global presence and local relevance
- Localization Commitment towards local industry
- Training & Skills Development
- Empowerment Opportunities
Nuclear Experience and Technology

- Westinghouse is the world's **pioneering nuclear power company**
- Westinghouse supplied the world's **first commercial PWR** in 1957 at Shippingport, Pennsylvania (USA)
- Westinghouse is a fully integrated worldwide supplier of **PWR and BWR** services
- Today, **Westinghouse technology** is the basis for approximately one-half of the world's operating nuclear plants, including 60 percent of those in the United States.
- **Westinghouse technology** is the basis for the two Koeberg nuclear power plant reactors
Westinghouse Electric Company Today: Four Product Lines

Nuclear Services
Focused on operating plant success through reliable operation, maximized power output and better (shorter, more predictable) outages

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

Nuclear Power Plants
Specializing in the technology of new nuclear power plants and component manufacturing

Nuclear Automation
Instrumentation and control solutions to enhance the reliability of nuclear plant control and safety systems.

Teaming with Toshiba on BWR technology, Balance of Plant and New Plant Supply
Westinghouse Global Presence

More than 15,000 People in 18 Countries Around the World

Many of these operations came through localization and technology transfer, e.g. France, Korea, Japan, China
AP1000...Westinghouse Advanced Passive Safety Plant

Mature

Safe

Simple
Unique Benefits of AP1000™

- Incorporates lessons learned from the past
  - **Simpler** (less equipment, easier to operate, etc.)
  - **Standardized** (design, processes, construction, procedures)
  - **Compact** (very small footprint)
  - **Safer**: pre-licensed (certified by US NRC, COL issued in US and China, compliant to European Utility requirements, being licensed in UK, Czech Republic, Canada)
  - Constructible via **modularization**
  - **Localizable**

COL: Combined Operating License
Localization
Localization – Keys to success

● Provide proven next generation nuclear technology
● Timely preparation of the local industry to achieve maturity for nuclear
● Regulatory process to be supported already in early stages
● Funding models / package
● Sufficient local skills development and training
● Operation and Maintenance support – long term commitment
Westinghouse and Localization

- Westinghouse does not have large internal manufacturing capabilities
- “We buy where we build” philosophy
- Westinghouse has built worldwide supplier base through localization
- Level of localization depends on the size of the nuclear program
- Large heavy components requiring large capital investment have limited localization potential
- AP1000’s Modularized concept provides specific opportunities for South Africa
AP1000 Design Features and Modularization Facilitating Localization

- **Passive safety features** yields design equivalent in safety to other designs, while using very little safety grade equipment
  - Local suppliers can participate without upgrading qualifications
  - 80%+ of design is non-safety
- Modules and containment vessel (CV) localized
- It is typical for > 50% of equipment to be localized
- Most of the Construction to be localized
Haiyang Module Factory

Local suppliers’ content
Module Installation on Site
Typical AP1000™ Cost Allocation by Type

- Site Construction: 41%
- Equipment: 43%
- Transportation: 4%
- Construction Mgmt: 6%
- Proj Mgmt/Engineering: 6%

> 60% Localized
Skills Development & Training
Skills Development for the South African Workforce

<table>
<thead>
<tr>
<th>Skills We Will Need To Develop in RSA</th>
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<tbody>
<tr>
<td>Boiler Makers/Pipe Fitters</td>
</tr>
<tr>
<td>Engineers</td>
</tr>
<tr>
<td>Carpenters/Shutter Hands</td>
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<tr>
<td>Operators</td>
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<tr>
<td>Electricians</td>
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<tr>
<td>Service Technicians</td>
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<tr>
<td>Iron workers (Rigger, erectors and fixers)</td>
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<tr>
<td>Procurement Experts</td>
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<tr>
<td>Cement Masons/Concrete Hands</td>
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<tr>
<td>Quality Assurance/Control Specialists</td>
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<tr>
<td>Millwrights</td>
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<tr>
<td>Welder Inspectors/Welders</td>
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<tr>
<td>Sheet Metal Workers</td>
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<tr>
<td>Project Managers</td>
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</tbody>
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Technology Transfer Enables Sustainability

- Westinghouse technology transfer will enable a sustainable nuclear program

South African nuclear industry capabilities will include:
  - Plant design
  - Safety analysis & core design
  - Operations, inspections, maintenance
Technology Transfer example (China)

- Technology transfer in connection with its advanced passive design
  - Includes training in those aspects of the technology that the Chinese have requested
- Detailed design on a broad range of other plant aspects are being performed by the Chinese Design Institutes.
Empowerment Opportunities
Empowerment opportunities

- Westinghouse buy where we build – our localization and technology transfer philosophy has been demonstrated in France, Korea and China. This model can also be used for empowering the South African Industry, focused on Black Owned companies
- Smaller number of safety components (increasing local supply chain)
  - Non-Safety nuclear components require less costly Quality Management Systems, allowing smaller companies to participate in the nuclear supply chain
Empowerment Opportunities

- Westinghouse in South Africa
  - Renewed focus on local nuclear industry
  - Local engineering presence to support Koeberg & Necsa
  - Increased drive to partner with local industry, with a specific focus on Black Owned companies
  - Knowledge transfer & training to customers & suppliers

- AP1000 construction philosophy allows for more than 60% local content
  - Substantial opportunities for empowering local suppliers
Questions and Discussion

Thank You!