GE Hitachi Nuclear Alliance

- Wilmington, NC USA
- Tokyo, Japan
- Wilmington, NC USA
- Wilmington, NC Yokosuka, Japan
- Peterborough, ON Canada

- Nuclear Power Plants, ABWR, ESBWR, and PRISM
- Nuclear Services
- Advanced Programs ... Recycling, Isotopes
- Uranium Enrichment ... Third Generation Technology
- Nuclear Fuel Fabrication ....BWR and CANDU
- CANDU Services
- Fuel Engineering and Support Services
BWRs around the world

- Dresden 1 – USA
- Dodewaard - Netherlands
- KKM - Switzerland
- K6/K7 - Japan
- Santa María de Garoña - Spain
- KRB - Germany
- Lungmen - Taiwan
- Garigliano - Italy
- Tarapur 1&2 – India
- Vallecitos – USA
- Laguna Verde - Mexico
Our new reactor portfolio

ABWR

ESBWR

PRISM
**ABWR**

- Best in-class CDF
- The only advanced Gen III technology in operation today
- Licensed in 3 countries
- 4 ABWRs in operation today
- 4 ABWRs under construction
- 1st of a kind plant built in 39 months with repeated success
- Less equipment, piping, etc. than similar sized PWRs

**ESBWR**

- Industry’s lowest CDF
- Passive safety and natural circulation design
- Cooling for >7 days without AC power or human action
- Lowest projected O&M and staffing costs
- 25% fewer pumps, valves, and motors
- Completing NRC certification
PRISM
Power Reactor Innovative Small Module

- Sodium cooled fast reactor
- Can use spent nuclear fuel as input
- 311 MWe (840 MWth) per reactor
- Fuel fabricated on-site in recycling center
- Features advanced safety and digital control systems
- Modular components allow for factory fabrication
Localization - striking the right balance

- Cost, risk and schedule
- Local content
Multiple phases of localization

Off site

Site Construction

O&M

Fuel Fab.

Sustainability
Opportunities for localization

**Nuclear**
- Pressure Vessels
- Reactor Internals

**Mechanical**
- Steam Turbine
- Condenser
- Heat Exchangers
- Pumps
- Valves

**Electrical**
- Generator
- Transformers
- Switchgear
- Cabinets

**Equip. Modules**
- Nuclear & non-nuclear

**Construction**
- Concrete
- Rebar
- Buildings
- Doors & Windows
- Piping
- Fencing
- Sand & Gravel
- Structural steel

**Chemical**
- Radioactive Waste
- Nitrogen & CO2 Storage

**Misc.**
- Fire Protection Systems
- HVAC Systems
- Cranes & Hoists
- Elevators
- Inspection Svcs

Sustainable localization helped via adjacencies
GEH quality transfer

- Driving Culture to all levels in the organization
- Incorporates Industry Lessons Learned
- Human Performance Tools
- 6-sigma statistical improvement and lean principles ... lasting changes

Driving to Quality at the source

Regulated Environment

- 10CFCR50 App B, Part 21
- ASME (10CFR 50.55a)
- ASME NQA-1
- ASME NCA-3800, 3900, 4000
- ISO 17025

Includes in-house and outsourced activities

Continuous improvement

- Independent quality inspection and complete records
- Independent audits to all the organization functions
- Control of procurement product ... Approved Supplier List controls

Solid product/process oversight

Training & people

- Initial training commensurate with position
- Qualifications for Quality Roles (Inspectors, NDE, Lead Auditors)
- Retrain and maintain production staff
- Procedure Reliance vs. culture of tribal knowledge

Dedicated Quality Resources

Inspection Auditing

- Solid product/process oversight
Supplier qualification process

- Proactive Qualification
- Four-Phased Tollgate Approach
- Commodity Specific
- Documented Qualification Plan
- Inspection Plan
- Risk Assessment and Mitigation
- Process Performance Monitoring of critical characteristics
- Cross-Functional Participation

“...to demonstrate that the supplier’s manufacturing and quality inspection processes are capable of producing material, and/or components that will consistently meet drawing and specification requirements.”
Modularization

Equipment

Piping, valves

Steel Structures

Module Fabrication

Module Shop

Site Installation
Japan Construction Experience

- 40 years of continuous construction experience
- Five generations of construction technologies

1970

1996

1997

2005

2006

2012*

2014*

Commercial Operation Year

NI and TI Island: Nuclear Island (NI) and Turbine Island (TI)

1st ABWR’s

TEPCO/Kashiwazaki-Kariwa-6

Chubu EPC/Hamaoka-5

Hokuriku EPC/Shika-2

Chugoku EPC/Shimane-3

J-Power/Ohma

Full MOX

MOX: Mixed Oxide fuel

• 40 years of continuous construction experience
• Five generations of construction technologies

* Planned

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Modularization factory for South Africa

- Center of excellence for training, quality and safety culture
- Incorporates lessons learned from Medupi/Kusile and RSA automotive industry
- Allows controlled ramp up
- ~11 years of utilization for 9.6GWₑ build ending with gradual repurposing

South Africa Enhancements:
- Nuclear Visitor’s Center (Necsa)
- Incubator
- Health center
Keys to O&M localization

Full scope simulator

Training refuel floor

Mockup & training areas:
- Under vessel area
- Control rod drive removal/refurb
- Valve and welding mockups
- Electronics lab
- Large pump training facility
GE Women’s Network

Mission:

• Foster professional women’s development to grow, attract and retain successful women throughout GE

• Provide development opportunities that focus on leadership, advancement and career broadening opportunities through information, education, and networking with other women