

# Raising the Bar



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**HITACHI**

**GLOBAL**  
Laser Enrichment

**GNF**

**Global Nuclear Fuel**

A Joint Venture of GE, Toshiba, & Hitachi

# GE around the world

Power & Water - \$25B  
Energy Management - \$5B  
Oil & Gas - \$13B  
Healthcare - \$18B  
Aviation - \$19B  
Transportation - \$5B  
GE Capital - \$46B  
Home & Business Solutions - \$9B

U. S  
US\$70B

Europe  
US\$29B

Canada &  
The Americas  
US\$13B

Middle East,  
Africa &  
Others  
US\$12B

Asia Pacific  
US\$23B

venues

n;

# GE's energy-related businesses

- 30% of GE revenue
- Technology partner for customers



## Oil & Gas

- Drilling & Surface
- Global Services
- Measurement & Control
- PII Pipeline Solutions
- Subsea Systems
- Turbomachinery

## Power & Water

- Aeroderivative Gas Turbines
- Gas Engines
- **Nuclear Energy**
- Power Generation Services
- Renewable Energy
- Thermal Products
- Water & Process Technologies

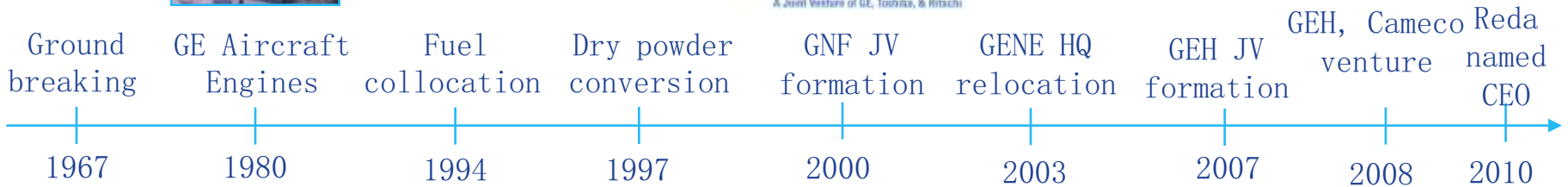
## Energy Management

- Digital Energy
- Industrial Solutions
- Power Conversion

# GEH nuclear energy HQ – Wilmington



- 1,650 acres (300 developed)
- Over 2 million manuf. square



10CFR70  
ISA rule  
published



# Nuclear product lines

## NPP



- ESBWR
- ABWR
- PRISM
- Engineering Svcs

## Fuels & Services



- Field services
- Outage support
- Asset mgt services
- Parts



- Fuel Products
- Engineering services
- Uranium support
- Enrichment services

Operating globally ... 2,800+ employees

# GEH licensed nuclear activities



## Wilmington

(SNM-1097)

UF6 Conversion

UO2 Powder and BWR Fuel  
Fabrication & LEU transport

GLE **Test Loop** Classified  
Technology



## Kurihama

Nuclear Material and  
Fuel Fabrication



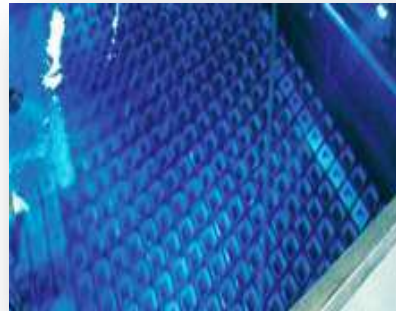
## Vallecitos

(SNM-960)

Spent Fuel Storage

Operating Nuclear Test  
Reactor

Hot Cell / Lab Facilities



(Picture does not depict fuel stored at  
Morris)

## Morris

(SNM-2500)

Spent Fuel Storage  
Facility



## Canada

Natural Uranium  
Processing and Fuel  
Fabrication / LEU

License 2010



## GLE

(SNM-2019)

Laser Enrichment  
Technology

GLE Commercial  
Facility

# ESBWR

1520 MWe Generation III+



## Passively Safe

- Passive cooling using gravity and condensation
- Passive cooling for >7 days without AC power or operator action

## Elegantly Simple

- Proven natural circulation technology during normal operations
- Lowest projected operations, maintenance, and staffing costs\*

## Smart

\* Claims based on the U.S. DOE commissioned 'Study of Construction Technologies and Schedules, O&M Staffing and Cost, and Decommissioning Costs and Funding Requirements for Advanced Reactor Designs  
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# What is PRISM?

## A reactor to address nuclear power's key challenges

### A fuel cycle solution

- Reactor designed to work integrally with a fuel fabrication and used fuel recycling facility
- Waste returns to natural levels in 300–500 years (300,000 years with today's used fuel)
- Reduces used fuel repository size by ~4X

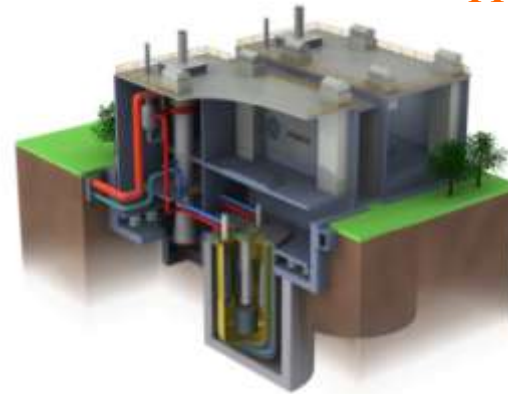
### Fuel efficiency, Energy security, and economics

- Uses the "spent" fuel from other reactors as its fuel supply
- Extracts 90% of the energy in uranium (Only 5% with water-cooled reactors)

### Safety

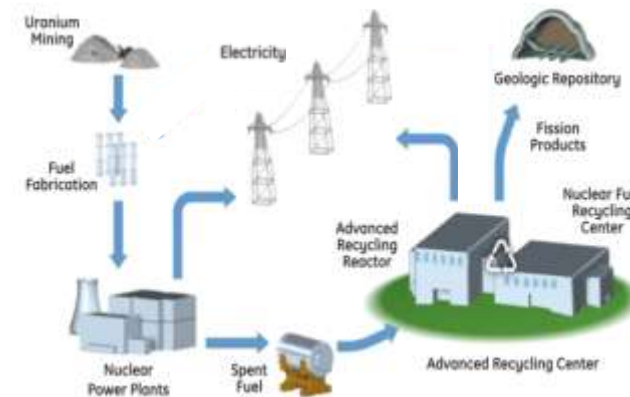
- Probability of accidental releases:  
1-10<sup>-10</sup>

### PRISM Power Block



Sodium cooled  
Metal fuel  
Pool reactor  
622 MWe

### PRISM Recycling Center



622 to 1866 Mwe with one  
to three power blocks



# GLE PLEF

## Paducah Opportunity Overview

- DOE seeking offers for the purchase of depleted UF<sub>6</sub>
- 15 yr. term with two 5 yr. extensions possible
- Accelerated timing to respond to DOE
- GLE proposes to “re-enrich” DUF<sub>6</sub> to “natural”

### Economic benefit to U.S.

- Payment to USG for DUF<sub>6</sub>
- Economic benefits from activity
- Reduction in DUF<sub>6</sub> liability for USG

### Utilization of Paducah site

- Amount of enrichment on the site
- Benefits of reuse of site facilities
- Benefits of new facilities

### National security

- Usability of Natural U for defense
- Support of non-proliferation goals
- Reduced foreign reliance for energy
- Enhances domestic nuclear industry



**GLOBAL**  
Laser Enrichment



The call to action ...



# Raise the Bar (RTB)

## Program Core



Simplify procedures  
and improve flow-down

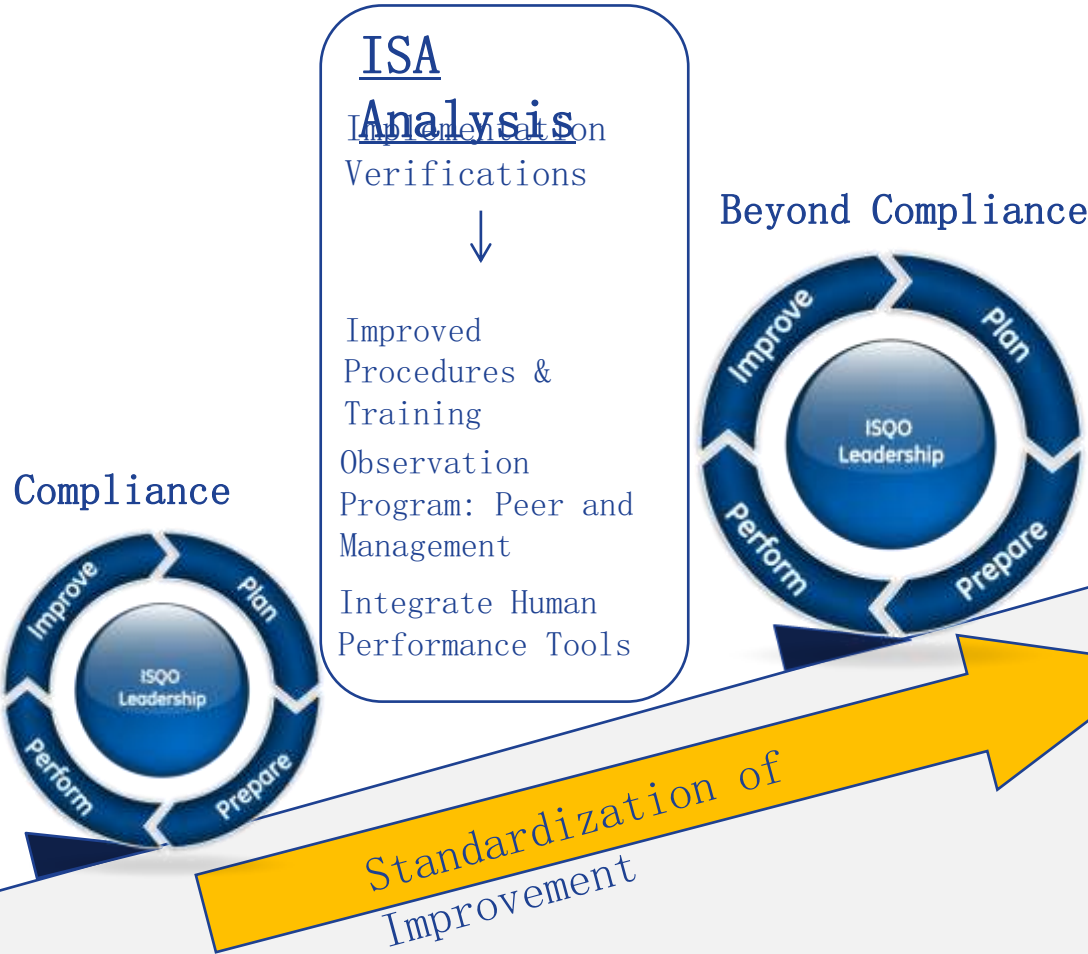
Strengthen process  
oversight + HU observations

Improve training  
program

Engage employees to  
assure  
organizational  
learning

- Nuclear Safety & Security Culture
- ISA program
- Procedures
  - Requirements flow-down
  - Simplified procedure format
- HU Observation Program
  - Staffed program – peer group
  - Added Management Observations
- Training
  - Implementing SAT -based program
  - OJT trainer/evaluator qualification program
- Employee engagement ... ongoing
  - Procedures, training and observations
  - OE/LL feedback to IROFS training

# RTB – moving beyond compliance



# RTB – Nuclear Criticality Safety



## GEH NCS Programs

Defined in SNM License Commitments

- 10CFR70 or equivalent
- Applicable ANSI/ANS-8 series national consensus standards
- NRC Reg Guide 3.74 exceptions to those standards
- Pro-active involvement with regulator and industry
- Active participation in consensus standards maint & development

## Pervasive Regulations



## GEH NCS Risk Assessment

- Must *be balanced* against other EHS safety and security disciplines
- Culture, ISA, procedures, training, HU, OE/LL, are all key element
- Is a *continuous* process