



JExel Overview

Dec 14th, 2017

US-Japan Roundtable Annual Washington Conference

JExel Nuclear Company

We provide advisory services and operation and maintenance management services for nuclear power project. We best support our customers utilizing JAPC's technical strength obtained through long operating experience of nuclear power plant and Exelon's nuclear management model to achieve excellent safety and high operation performance

Ralph L. Hunter, Jr., EVP



JExel Nuclear Company

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Exelon Overview



Exelon is Fortune 100 company that works in every stage of the energy business: power generation, competitive energy sales, transmission and delivery. As the nation's leading competitive energy provider, Exelon does business in 48 states, D.C., and Canada and had 2016 revenues of \$31.4 billion. We employ approximately 34,000 people nationwide.



Generation

Exelon Generation

Generation Capacity:

- More than 35.5 GW of merchant nuclear, gas, wind, solar, and hydroelectric
- One of the largest & best managed nuclear fleets in the world (~22 GW)
 - 15 sites, 25 reactors (2 decom)
 - Nuclear safety culture
 - 94.6% capacity factor – highest of major operators worldwide
 - Shortest & most consistent refueling outage durations
 - Lowest production costs with low variability



Energy Sales & Services

Constellation

Competitive Energy Sales:

- Leading competitive energy provider in the US
- Approximately 2.5 M customers
- Wholesale sales, dispatch and delivery from Exelon's ~35.5 GW power generation portfolio
- Portfolio & risk management capabilities
- Extensive suite of products including Load Response, RECs and Distributed Solar



Transmission & Delivery

Atlantic City Electric, BGE, ComEd, Delmarva Power, PECO, and Pepco

Service:

- 10 million electric and natural gas customers
- Service Territory: 24,200 mi²
- Electric Transmission: 11,000 mi
- Significant investments in Smart Grid technologies



JExel Nuclear Company



- **Exelon's nuclear fleet**

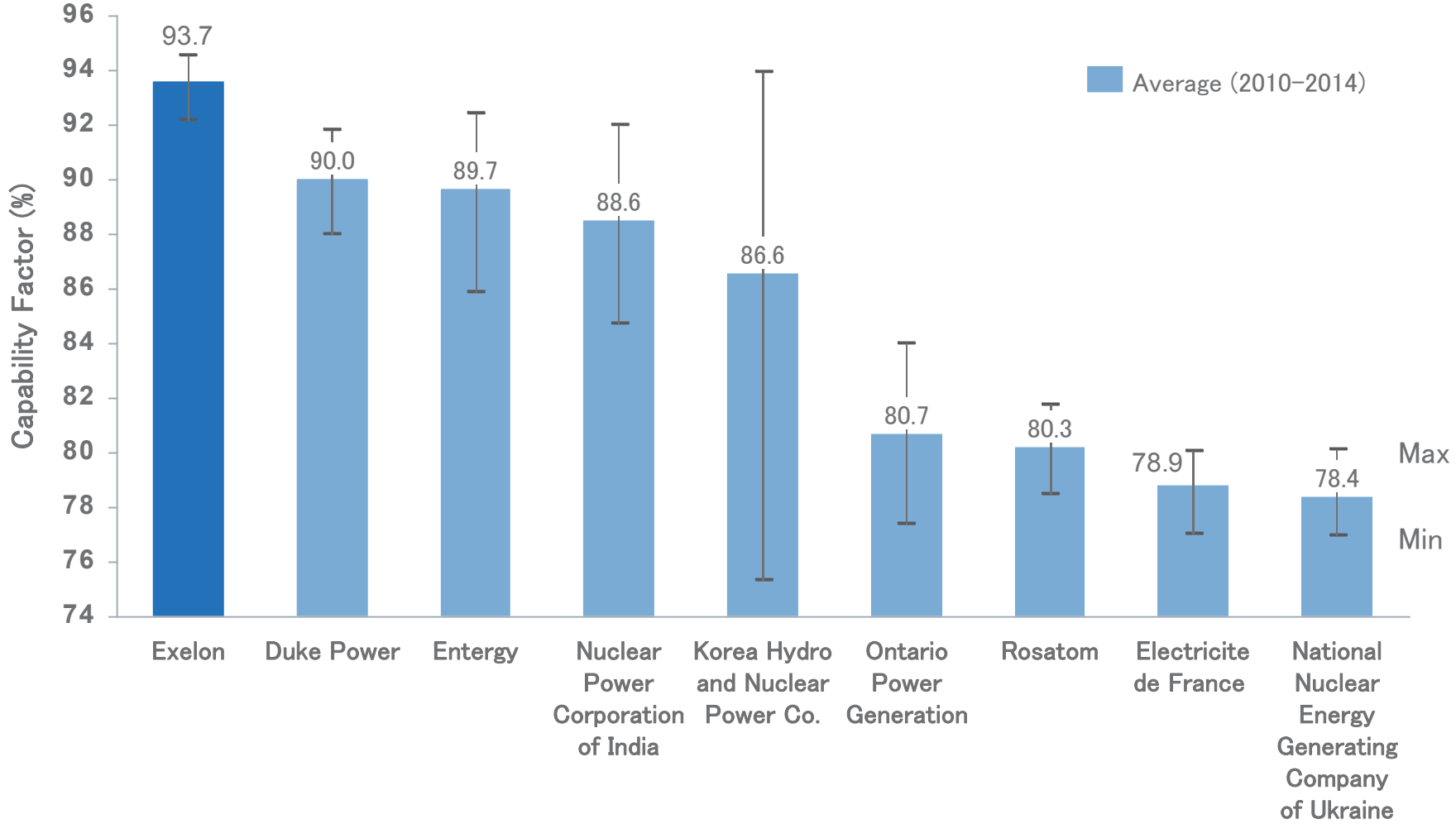
- One of the largest fleets in the world
 - 15 sites (1 under decommissioning)
 - 25 reactors (2 under decommissioning)
 - Generation capacity ~22 GW
- Safe and efficient operations – driven by Exelon Nuclear Management Model (ENMM)
 - Nuclear safety culture
 - Top quartile TISAR and CRE performance
 - 94.6% capacity factor – Exelon outperforms all major nuclear plant operators worldwide
 - Shortest and most consistent refueling outage durations
 - Lowest production costs with low variability

- **Transferability of ENMM**

- US and global efforts
 - Fort Calhoun restart and operations
 - Formation of JExel joint venture with JAPC
 - Partnership with Horizon Nuclear Power
 - Past efforts in China, Japan, Korea, UAE
- Training and human capacity building
 - Exelon Nuclear University – academic and experiential training in the ENMM
 - Collaboration with universities and technical/vocational colleges
 - Craft training – mock-ups and labs for welding, chemistry, RP, I&C, maintenance crews, etc



Global Performance - Capability Factor



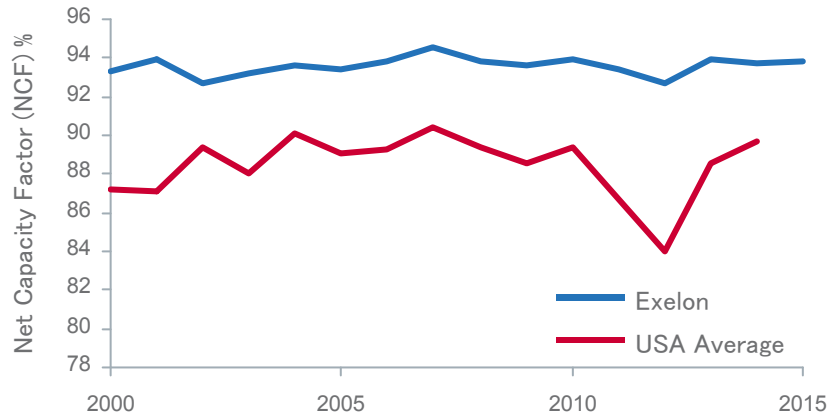
Exelon outperforms all major nuclear plant operators worldwide

Reference- IEA PRIS Database
 Worldwide unit 1-year average Capability Factor Data (2010-2014) by largest operators (based on no. of units)

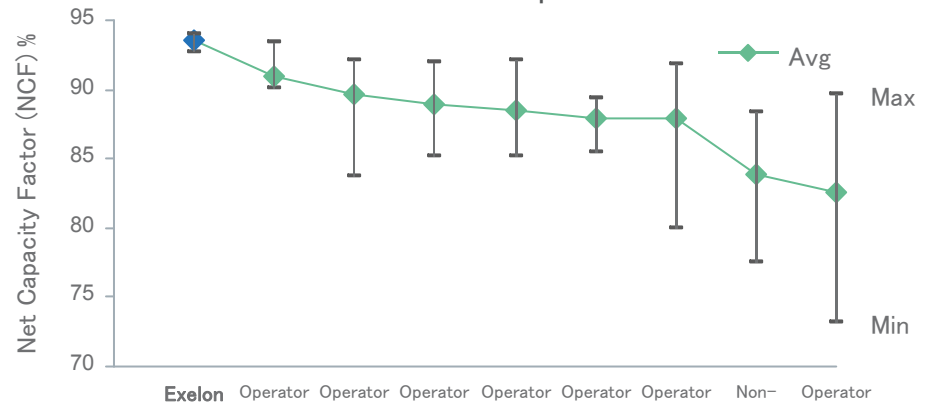
USA Performance Indicators



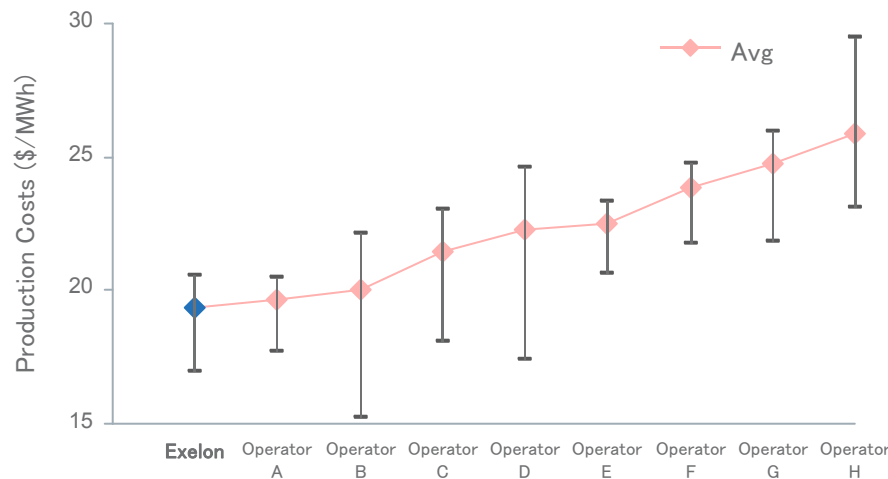
Exelon has consistently outperformed USA competitors in terms of NCF



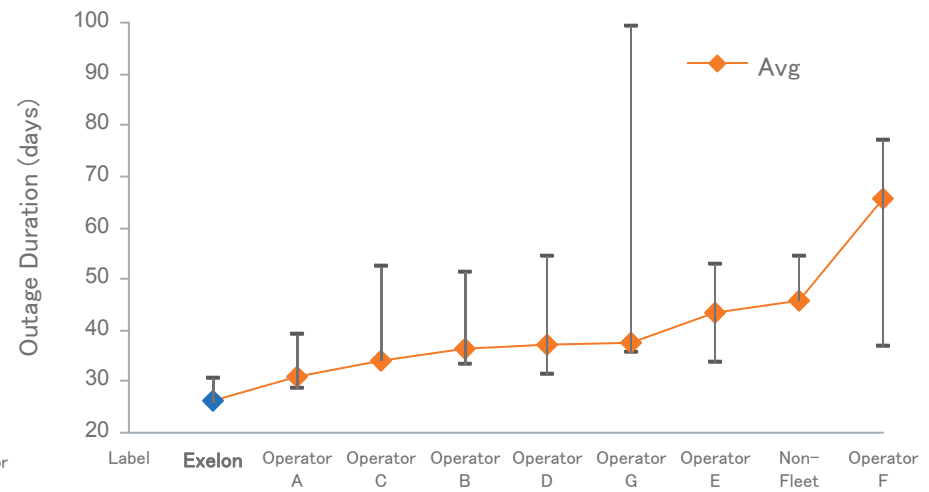
Exelon's fleet has the highest average NCF as well as the most consistent performance



Lowest production costs with low variability



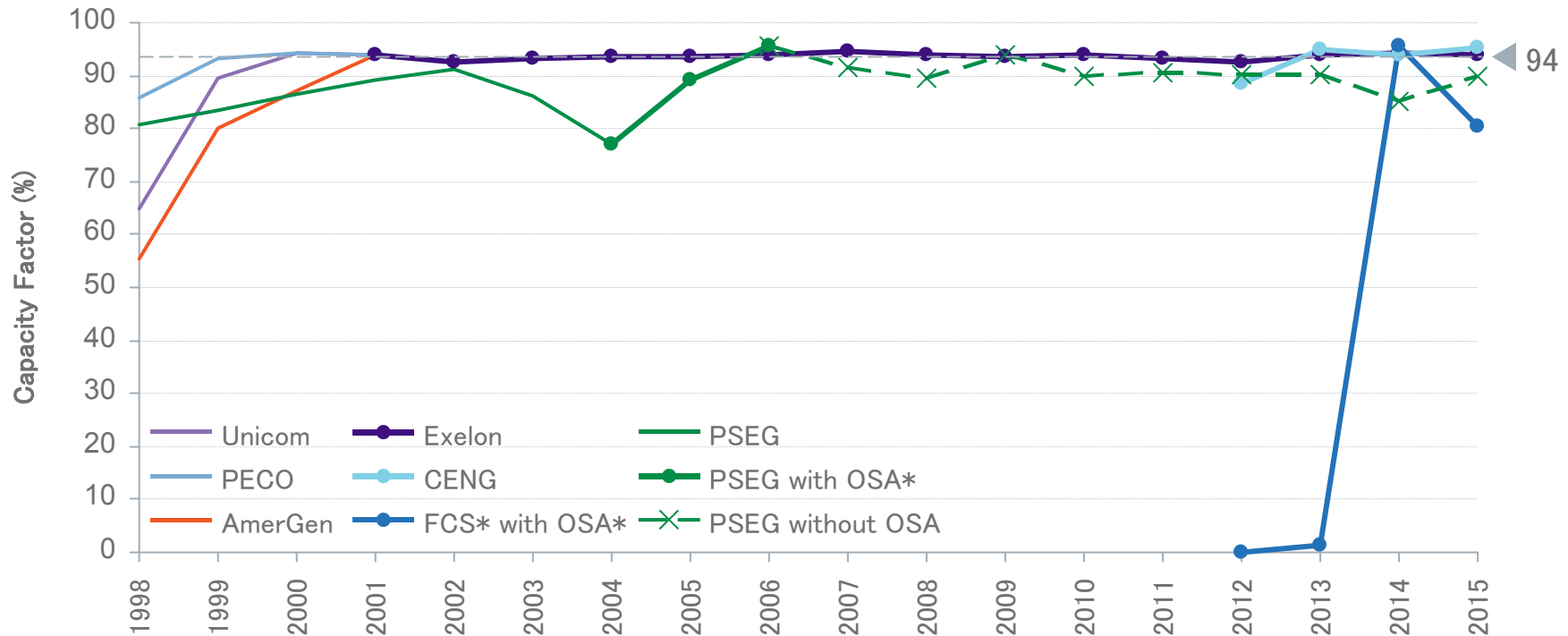
Shortest and most consistent refuel outage duration



Exelon has achieved sustained excellence across key performance metrics over 15+ consecutive years



Results of ENMM at Exelon Sites

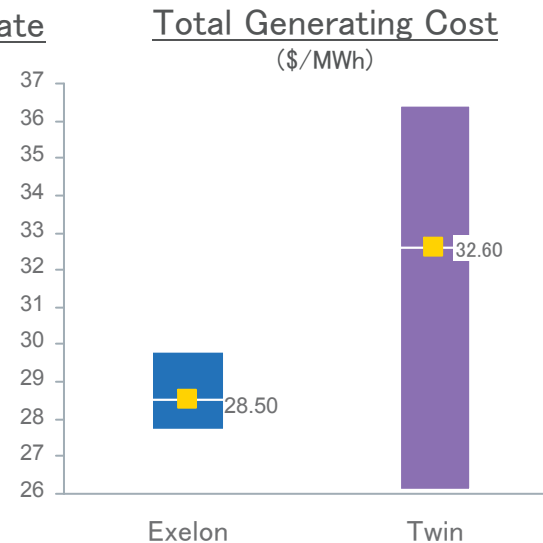
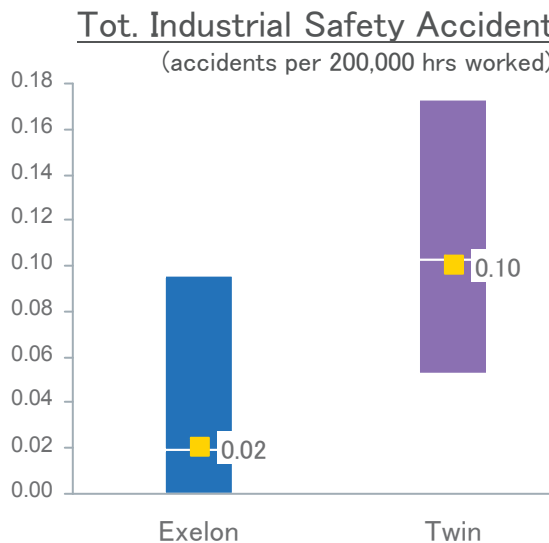
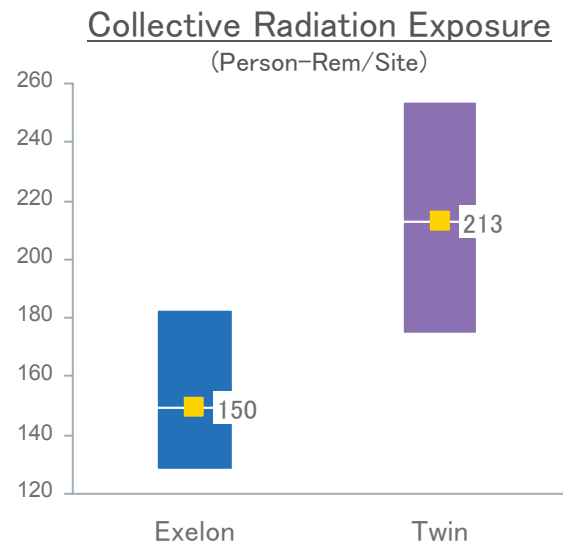
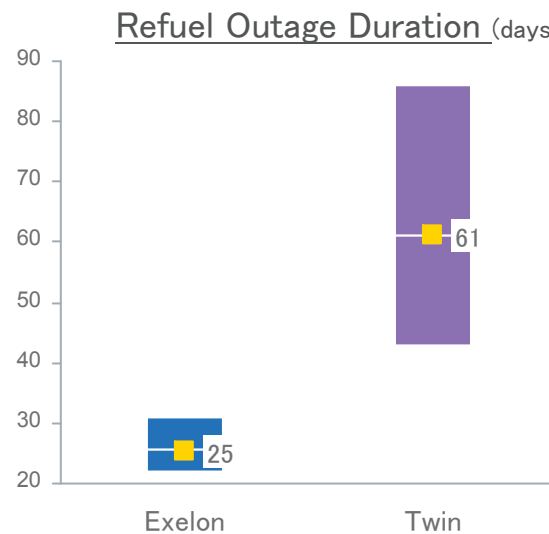
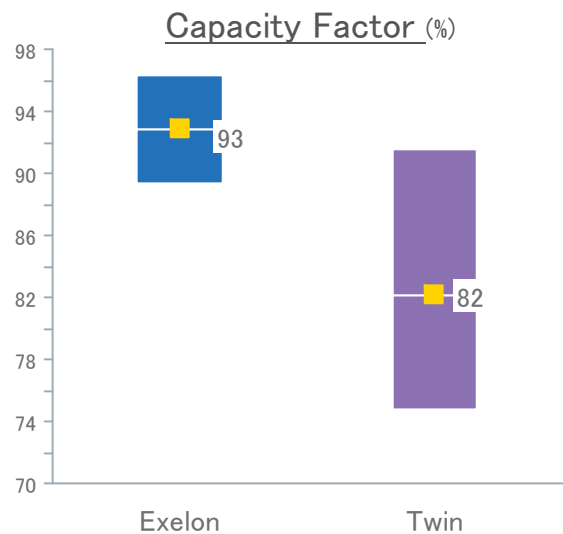


- Exelon Nuclear has implemented its Management Model in 23 units, with sustained, similar excellent results
- Exelon has maintained an average fleet-wide capacity factor that is consistently high and averages >93%
- Exelon Management Model has demonstrably improved performance of plants it has acquired or entered into an Operating Services Agreement with

The Exelon Nuclear model works, is scalable and transferable

OSA – Operating Services Agreement; FCS – Fort Calhoun Station; CENG – Constellation Energy; PSEG Public Service Enterprise Group; PECO – Philadelphia Electric Co.

Limerick Plant vs Twin BWR Station Case Study



Primary driver of results is directly attributed to the Exelon Nuclear Management Model



JExel Service Offerings



JExel provides a platform for international business development and will offer advisory services to nuclear clients in various stages of the nuclear life-cycle: Pre-FID and Post-FID

New builds

- Provides advisory services in functional areas such as engineering, maintenance, operations, and training
- Advises and assists corporate teams with NSLs, organizational effectiveness, and technology improvements
- Advisory services are enhanced by the licensing and implementation of the ENMM
 - JExel leverages the performance excellence and intellectual property of Exelon and the BWR technical expertise of JAPC
 - Implementation of the ENMM is proven and transferrable
 - The Management Model has been applied to nuclear plant operations improving both safety and capacity
 - Capacity factors have improved to over 93% after all implementations
 - The model is technology-neutral and will successfully enhance plant performance regardless of technology



JExel-Horizon Advisory Services Agreement



Current Status

- An Advisory Services Agreement was executed between Horizon and Exelon in February 2017

Current Scope

- Four Senior Advisors from Exelon with expertise in engineering, maintenance, operations, and training were deployed to Gloucester to provide immediate support starting February 2017
- The Senior Advisors work as an integrated part of Horizon's Operations team
- A US-based Exelon program manager serves as point of contact for access to Exelon US including
 - Leadership experience, strategy and support
 - Exelon Nuclear fleet access, intellectual property and know-how
 - Back office support
- Additional expertise will be deployed to Gloucester in 2018 to help Horizon with the project

