State of Small Modular & Next Generation Nuclear Power Production

March 25, 2019
Where it All Began – SSN-571 – The Nautilus, Hyman Rickover and Shippingport Atomic Power Station
But Submarines Weren't the Whole Story – Other Army and Navy Reactors

SM-1 at Fort Belvoir, Va. (2 MW)
First Reactor at Military Base

PM 3A - McMurdo Sound, Antarctica (1.8 MW) - Used 30,000 lb Modules

MH 1-A The Sturgis (10MW)
Deployed at Panama Canal
And...The Atomic Energy Commission Was Designing Many Innovative Reactors – Roots of Today's Innovators

Peach Bottom Unit 1 – General Atomics
HTGR (60 MW)

EBR 1 Fast Breeder (60MW)

Molten Salt Reactor Experiment (7.4 MW)
Opportunities for Small Modular and Advanced Reactors

- Nuclear power represents 60% of the U.S. carbon-free generation and 35% of international total
- Small and advanced nuclear power plants are generally targeted to be 40-700 MWe
- But…significant opportunities for Micro Nuclear Reactors of 1-10 MWe
- Many designs are planned for load following and will be complementary to renewable deployment
- Small footprint and ease of use will allow additional deployment opportunities
U.S. Small Modular and Advanced Reactor Technologies – Status Report

- **Advanced Nuclear Reactors**
  - **Third Way** – Over 50 Advanced Reactors designs being developed
  - **U.S. Congress** - Appropriated $1.46 Billion in FY19 for Office of Nuclear Energy

- **NuScale** – Design certification under NRC review - expected September 2020 completion

- **X–energy** – Received $4.5 million DOE FOA for fuel fabrication facility to produce high-assay, uranium oxide TRISO Particle Fuel

- **Terrestrial Energy** – Has received three GAIN grants to pursue molten salt reactor design

- **GE/Hitachi – Prism** – Selected by DOE for Virtual Test Reactor deployment at Idaho National Lab

- **Oklo** – 2 MW Microreactor preparing for NRC design review and near term deployment
Broad Opportunities Exist Beyond Baseload Power…

Jebel Ali Desalination Plant – Dubai
2,060 MW and 140 Million gallons per day

Diesel generator and tank farm
In Alaska – opportunities for Micro Reactors in remote areas

Heat and power opportunities at petrochemical facilities worldwide
Thank you

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