Southern Nuclear Operating Company, Inc. Briefing to NRC Commissioners on Advanced Reactor Preparedness through Regulatory Engagement and Research Cooperation

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Southern Company

Topics



- SNC Perspective on Advanced Reactors
- Advanced Reactor Demonstration Project DOE award for risk reduction
- Approach to licensing (Licensing Modernization Project and guidance)

SNC Perspective on Advanced Reactors



Develop and demonstrate high potential advanced nuclear options that can provide the best value to the company & customers

RIGHT TECHNOLOGY

- Provide the backbone of a net zero economy clean electricity, heat, hydrogen
- Address safety & sustainability

RIGHT TIMELINE

- · Support decarbonization commitments & demands
- Replace potential retirements

RIGHT COST

• Competitive with natural gas combined cycle with post-combustion carbon capture and solar with battery

BEST VALUE

- Grow revenue in a rate neutral way
- · Be options positive expand the market past electricity

Advanced Reactor Demonstration Project DOE award for Risk Reduction Project



ADVANCED REACTOR DEMONSTRATION PROGRAM \$113M TOTAL PROJECT (80/20 Cost Share)

- Principal Investigator: Nick Irvin
- Program Manager: Lauren Lathem

MOLTEN CHLORIDE REACTOR EXPERIMENT

MCRE will be the first fast spectrum molten salt reactor in the world and the fourth MSR ever operated

INL sited & DOE authorize

TerraPower

- Low power operation up to ~500 kWth
- Provides empirical nuclear data to support design and licensing of MCFR Demo
- Demonstrates safe reactor control under a variety of operating conditions

VRIC

National Reactor

Innovation



Approach to Licensing



Regulatory Framework to Support Development and Deployment of a Variety of Innovative Solutions

AGILE

- · Coherent, integrated safety-focused requirements for entire plant life cycle
- A dependable platform to equitably treat a variety of nuclear energy generating systems

PREDICTABLE

- Performance-based objectives are explicitly established
- Technology-inclusive guidance to meet the expected objectives are provided

RESILIENT

Manages state-of-knowledge and state-of-art changes effectively without unnecessary burden, delay or disruption

Technology Inclusive Risk-Informed Performance-Based Framework Part 53 NEI 18-04 / RG 1.233 (LMP) – Optional Method

Abbreviations

- SNC Southern Nuclear Operating Company, Inc.
- MCRE Molten Chloride Reactor Experiment
- MCFR Molten Chloride Fast Reactor
- INL Idaho National Laboratory
- DOE Department of Energy
- NRC Nuclear Regulatory Commission
- MSR molten salt reactor
- NRIC National Reactor Innovation Center
- LOTUS Laboratory for Operation and Testing in the United States
- EPRI Electric Power Research Institute
- NEI Nuclear Energy Institute
- RG Regulatory Guide
- LMP Licensing Modernization Project