





**DOE** Perspectives on Advanced Reactor Development and Licensing Alice Caponiti Deputy Assistant Secretary for Reactor Fleet & Advanced Reactor Deployment Office of Nuclear Energy U.S. Department of Energy

#### DOE Technology Inclusive Initiatives Can Expedite the Retirement of Regulatory Risk While Modernizing the Regulatory Framework



# Why is DOE Interested in Assuring a Risk-Informed Performance Based (RIPB) Approach to Advanced Reactor Licensing ?

- Reactor plant event sequence identification, evaluation, and safety system classification are a key source of regulatory uncertainty impeding advanced reactor deployment
- Difficult to consistently and confidently address uncertainty through a purely "ad-hoc" and expert judgment-based approach due to:
  - Wide variation in reactor technologies and safety case approaches
  - Financial uncertainty created by late-stage and less structured regulatory decisions
- RIPB approach is technology-inclusive and can be applied to the broad range of advanced reactor designs being supported by DOE
- Assists industry stakeholders and DOE in identifying vulnerabilities and uncertainties and focus research efforts in the most impactful areas

#### DOE Has a History of Promoting Risk-Informed Performance Based (RIPB) Methodologies

- Directly and consistently supported RIPB approaches to the design and licensing of advanced reactor technologies since the 1980's
  - General Atomics
  - Exelon Pebble Bed Modular Reactor
  - Next Generation Nuclear Plant (NGNP)
  - Licensing Modernization Project (LMP)
  - LMP Pilot Studies on a variety of designs
- Efforts resulted in the approach now being considered by the Commission
  - Per the Advisory Committee on Reactor Safeguards (ACRS), RIPB approach reflects the culmination of DOE, NRC and industry insights and "good practices"
- Strong partnerships and focus on RIPB methodologies continue between the private sector and Government

### **RIPB** Approach Going Forward

- Ongoing DOE projects, are implementing the RIPB approach developed through the LMP in support of the DOE authorization process
- Continue DOE cost-shared initiatives addressing licensing (TICAP) and individual awards to industry
- Promote advanced reactor regulatory efficiency by assisting industry in developing NRC application development
- Continue collaborations with the international community on advanced reactor technologies

## NRC Coordination & Engagement

- Joint advanced reactor deployment activities (LMP, TICAP)
- Nuclear Energy Institute Advanced Reactor Working Group and Technology-Specific Technical Working Groups
- Ongoing NRC-DOE partnerships to evaluate emerging technologies

#### Ongoing and Planned DOE Advanced Reactor Development and Deployment Efforts

- Advanced Reactor Technologies (ART) Program National Laboratory R&D Activities
- Versatile Test Reactor
- Advanced Reactor Demonstration Program
  - National Reactor Innovation Center (NRIC)
  - Advanced Reactor Demonstrations
  - Risk Reduction for Future Demonstrations
  - Regulatory Development
  - Advanced Reactor Safeguards
- ARC-20 Awards
- Industry Funding Opportunity Announcement Awards

## Questions?

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