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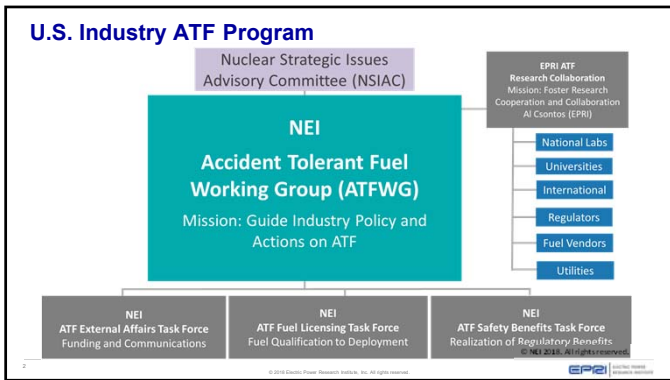
EPRI's Accident Tolerant Fuel Research *Collaboration in Innovation*



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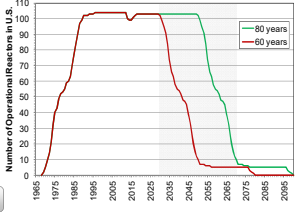


Need for Accelerated ATF Path Forward

- Challenge: traditionally long fuel design to deployment timeframes
- Limited window of opportunity:
 - Existing fuel testing facilities
 - Abundant R&D programs
 - Limited economic viability for ATF benefits to the existing fleet
- Industry committed to support ATF reloads into commercial reactors by early to mid-2020s

Accelerating ATF is a Heavy Lift

Projected operating life for Domestic LWR fleet

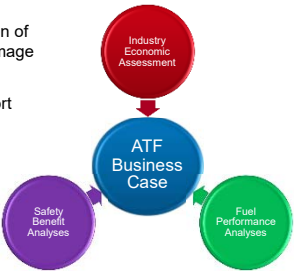


Year	60-year operating life (Reactors)	80-year operating life (Reactors)
1965	0	0
1975	40	40
1985	100	100
1995	100	100
2005	100	100
2015	100	100
2025	100	100
2035	100	100
2045	100	100
2055	100	100
2065	100	100
2075	100	100
2085	100	100
2095	100	100

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ATF Valuation 1.0: Key Conclusions

- For BDBA cases:
 - ATF delays core damage, but, restoration of core cooling needed to prevent core damage
- For DBA/AOO cases:
 - Safety margin improvements may support operational enhancements
- Consistent with stakeholder results:
 - Vendors, MIT, UW, INL, and ORNL
- ATF a key element to an integrated approach to enhanced plant safety
- ATF Valuation 2.0 opportunities for expanding benefits underway



ATF PIRT Gap Analyses

- ATF gap analyses with the Phenomena Identification & Ranking Table (PIRT) Process:
 - Leverage global resources to identify, prioritize, and target R&D to accelerate ATF innovation
 - Facilitate R&D decisions by identifying and ranking key technical, regulatory, and operational issues
- Issue resolution report:
 - Prioritized plan that addresses identified gaps
 - Foster stakeholder engagement that addresses generic technical and regulatory issues
- Cooperative PIRTs (gap analyses) with ATF stakeholders key to reduce duplication of effort
- Potential SIC and Advanced Fuels PIRTs:
 - Data and modeling gaps



Advanced Modeling and Simulation (M&S) for ATF

- Advanced M&S and/or modifications of existing codes:
 - Near-term concepts: existing approved codes with minor modifications
 - Longer-term concepts: advanced M&S and/or significant modifications
- Advanced M&S used in other industries to reduce time and cost of introducing new innovative technologies from design to market
- Potential benefits of advanced M&S for ATF:
 - Design optimization and operational assessments (Crud, etc.)
 - Potential opportunities to reduce number of iterations of irradiation testing and post-irradiation examinations possibly along with advanced NDE
- Further collaboration with ATF stakeholders to identify and prioritize modeling gaps for longer-term concepts through PIRTs

Summary

- Industry committed to support ATF reloads by mid-2020s
- ATF Valuation 1.0 completed:
 - "...the work completed by the task force does illustrate the potential for economic benefits to utilities resulting from the deployment of ATF."
- ATF Valuation 2.0 underway:
 - Examining additional opportunities for safety and economic benefits
- PIRT Gap Analyses:
 - Identify technical/regulatory gaps, areas of synergy, and common opportunities for research collaboration to reduce duplication
- Advanced M&S could be leveraged for longer-term ATF concepts as tools for both regulators and industry



Together...Shaping the Future of Electricity

ATF Valuation 1.0: Stakeholder Collaboration



Extensive stakeholder collaboration on ATF safety benefits
