

ADVANCED TECHNOLOGY FUEL


Industry Perspective

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Status

- Accident at Fukushima Daiichi - our call to action
- Development of Advanced Technology Fuel concepts to date has been good - faster than typical new product development
- Much development work remains to be done
- Further acceleration is needed
- Four primary paths – coated cladding, silicon carbide (SiC) cladding, non – zirconium cladding and metallic fuel (pellet changes included with coated cladding and SiC)



Safety Potential

- Advanced Technology Fuel is a profound “game-changing” innovation enhancing reactor safety
- Advanced Technology Fuel transforms the current fleet into “advanced reactors” - significantly lengthens the time before fuel damage when core is without cooling
- Advanced Technology Fuel enhances public confidence in nuclear energy



Regulatory Potential

- Enhanced safety provided by Advanced Technology Fuel supports regulatory simplification
 - Enhance risk-informed re-categorization of SSCs (in the U.S., via 10 CFR 50.69)
 - Optimize security and EP requirements
 - Simplify FLEX implementation
 - Risk-inform inspection activities and simplify significance determinations



3

Goals

- Safety enhancements can reduce accident likelihood
 - Coated or non-zirconium cladding designs should prevent core damage during an event like TMI
 - Silicon carbide cladding or metallic fuel designs should prevent core damage during an event like Fukushima Daiichi
- We must challenge ourselves to deploy Advanced Technology Fuel on an aggressive schedule
 - Lead test rods/lead test assemblies by 2018/2019
 - Full core reloads by the early 2020s



4

Needs

- Expanded international collaboration and coordination
- Well-funded research and development, test reactor irradiations, and post-irradiation examinations
- Simplified and timely fuel licensing framework
- Improved use of advanced fuel and reactor analysis software
- Increased limits on fuel enrichment and burnup
- Simultaneous consideration of non-fuel core components
- Reflect enhanced safety in equipment categorization, and other regulatory requirements



5

Delivering the Nuclear Promise

Advanced Technology Fuel
- The Game Changer -

Align Industry and NRC on
Enhancing Safety with ATF



6
