

NRC Regulatory Information Conference - Panel on Accident Tolerant Fuel Readiness

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Accident Tolerant Fuel: Congressional Direction and Development Plan

Following the accident at Fukushima, Congress directed the Department of Energy to begin developing fuels with enhanced accident tolerance that can be used in existing light water reactors.

The Development Plan:

- Identified attributes of accident tolerant fuels
- Laid out a 10-year schedule starting in 2012
- Established the goal of inserting Lead Test Rods/Assemblies in an operating commercial light water reactor by 2022



March 11, 2011

Improved Reaction Kinetics with Steam

- Decreased heat of oxidation
- Lower oxidation rate
- Reduced hydrogen production (or other combustible gases)
- Reduced hydrogen embrittlement of cladding

Improved Fuel Properties

- Lower fuel operating temperatures
- Minimized cladding internal oxidation
- Minimized fuel relocation/dispersion
- Higher fuel melt temperature

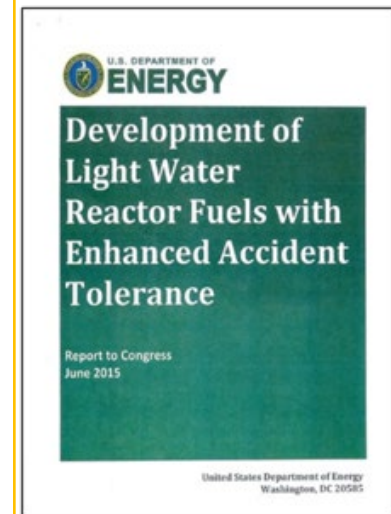
**Enhanced
Tolerance to Loss
of Active Core
Cooling**

Improved Cladding Properties

- Resilience to clad fracture
- Robust geometric stability
- Thermal shock resistance
- Higher cladding melt temperature
- Minimized fuel - cladding interactions

Enhanced Retention of Fission Products

- Gaseous fission products
- Solid/liquid fission products



Key U.S. ATF Fuel Milestones

