

Status of DOE's Accident Tolerant Fuel Program

NRC Public Meeting with Industry on Accident Tolerant Fuel
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Outline

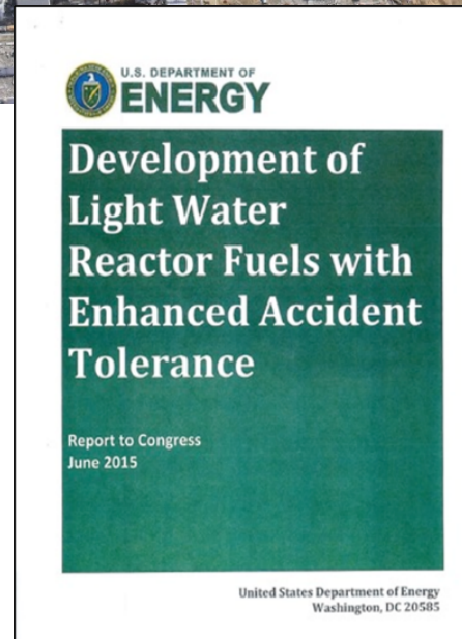
- Congressional Direction and Development Plan
- National Laboratory R&D Support

Congressional Direction and Development Plan

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

The Development Plan:

- Defines the general attributes of accident tolerant fuel.
- Lays out an aggressive 10-year schedule starting in 2012.
- Establishes the goal of inserting a lead fuel assembly or lead fuel rod in an operating commercial light water reactor by 2022.



Development Plan

- Phase 1: Feasibility Assessment and Down-Selection
 - FY 2012-2016
 - Collaborative partnership between DOE, industry, and universities
- Phase 2: Development and Qualification
 - FY 2017-2022
 - Industry led efforts supported by DOE national infrastructure and universities
- Phase 3: Commercialization
 - FY 2022 and beyond
 - Industry commercial activity deploying ATF into existing and future reactor systems

Development Plan Being Updated

1. Revise the end state of Phase 2 (Development and Qualification) to include more than one set of lead fuel assemblies/lead fuel rods at one reactor.
2. Update and provide more details on the activities that make up Phase 2.
3. Describe Phase 3 activities (Commercialization).
4. Identify roles and responsibilities across multiple organizations, DOE, fuel vendors, utilities, EPRI, NEI, and the NRC.

U.S. DOE- Continues to support industry teams working to insert ATF into LWRs

Framatome

- **Cr coated Zr**
- **Additives**
 - Chromia dopant



General Electric

- **Iron-chrome-aluminum (Fe-Cr-Al) fuel cladding**



Westinghouse

- **Cladding concepts:**
 - SiC and SiC ceramic matrix composites;
 - coated Zr alloys
- **High uranium density/high thermal conductivity uranium silicide fuel pellets**



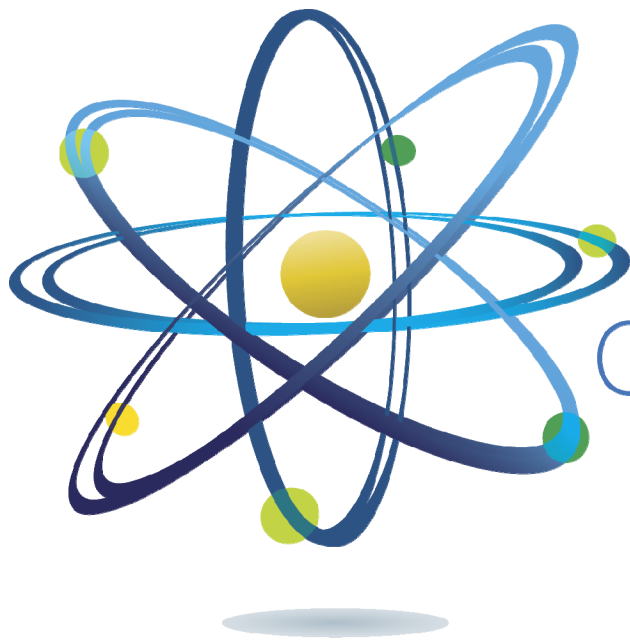
National Laboratory R&D Support to Industry and NRC

- Irradiation Testing
 - Advanced Test Reactor at Idaho National Laboratory
 - Halden test reactor in Norway
- Post Irradiation Examination
 - Baseline and advanced PIE
- Safety Testing
 - Integral LOCA test facility at Oak Ridge National Laboratory
 - Transient Reactor Test (TREAT) Facility at INL
- Advanced Modeling and Simulation
 - Nuclear Energy Advanced Modeling and Simulation (NEAMS) Program
 - Consortium for Advanced Simulation of Light Water Reactors (CASL)

Summary

- **Phase 1, Feasibility Assessment and Down-Selection, is complete.**
- **Phase 2, Development and Qualification, is expanded and accelerated to support industry.**
- **National laboratories are supporting the industry teams and the NRC:**
 - Irradiation testing
 - Post irradiation examination
 - Safety testing
 - Advanced modeling and simulation

Questions?



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