



Global Nuclear Fuel

NRC Meeting to Discuss Shipping Accident Tolerant Fuel in the GE Model No. 2000

December 17, 2018

Agenda

Non-Proprietary Discussion

- General Overview

Proprietary Discussion

- Description of Global Nuclear Fuel's ATF Technologies
- Programmatic Timeline
- Description of the LTAs to be Transported
- Description of the GE2000 and High Performance Insert
- Licensing Strategy



General Overview

- Overview of US Department of Energy (DOE) Accident Tolerant Fuel (ATF) Program
 - IronClad
 - ARMOR

Description of GNF ATF LTAs

GE IronClad Technology

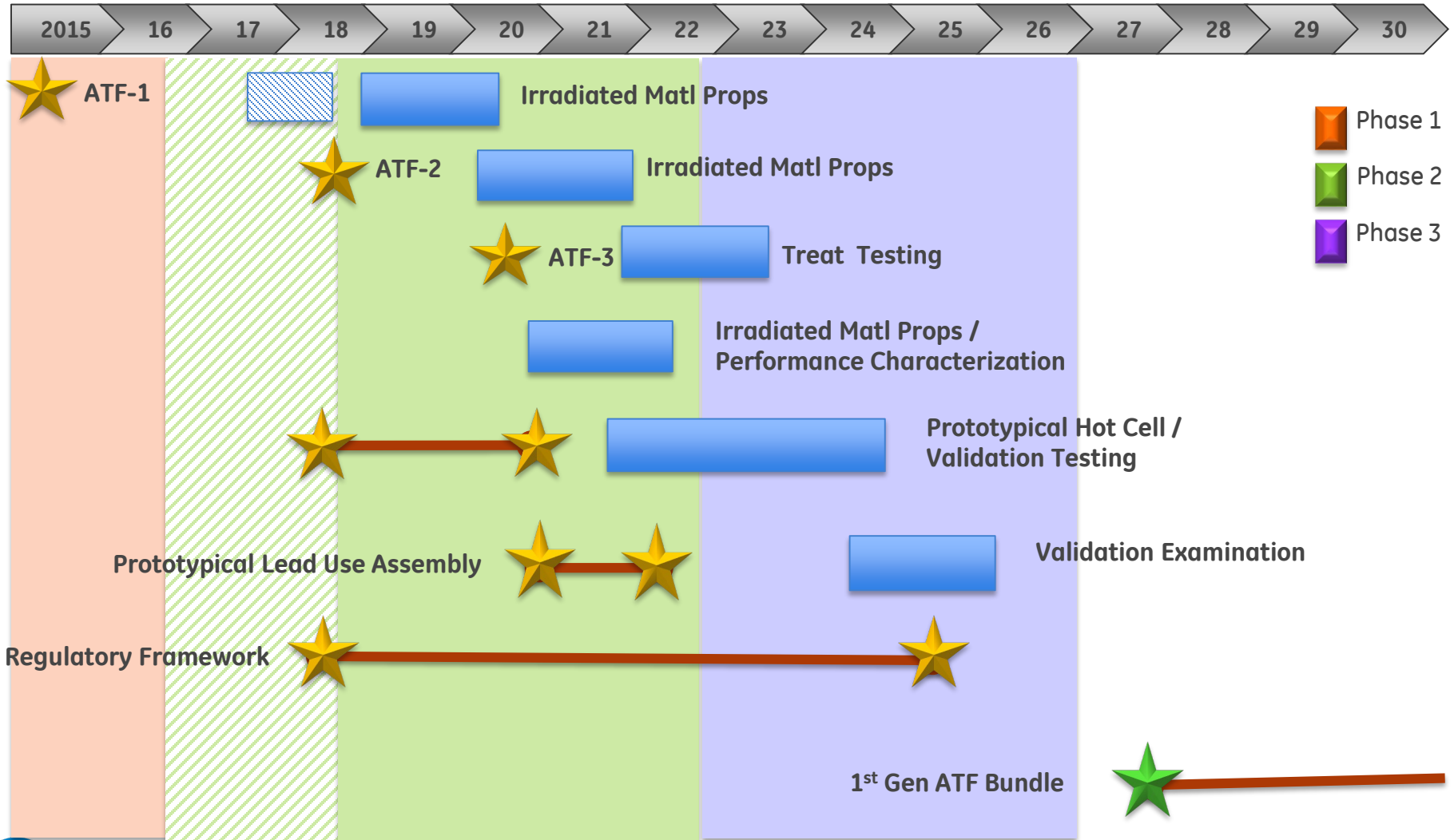
- GNF's specific cladding technology developed under DOE ATF program
- FeCrAl based material, readily manufactured
- Robust material related to fast reactor cladding
- Unfueled IronClad segmented rods installed in Hatch Unit 1 1Q18

GNF ARMOR Technology

- Abrasion Resistant More Oxidation Resistant coating
- Fret resistant coatings
- Effective for oxidation resistance for AOO & DBA benefit potential and debris mitigation
- Four assemblies contain multiple segmented rods installed in Hatch Unit 1 1Q18



Programmatic Timeline



Description of Hatch 1 LTAs

- Installed 1Q18 with planned inspection and harvesting
- GNF2 fuel design
- Full-length test rods
- ARMOR – fueled rods
- IronClad – unfueled rods

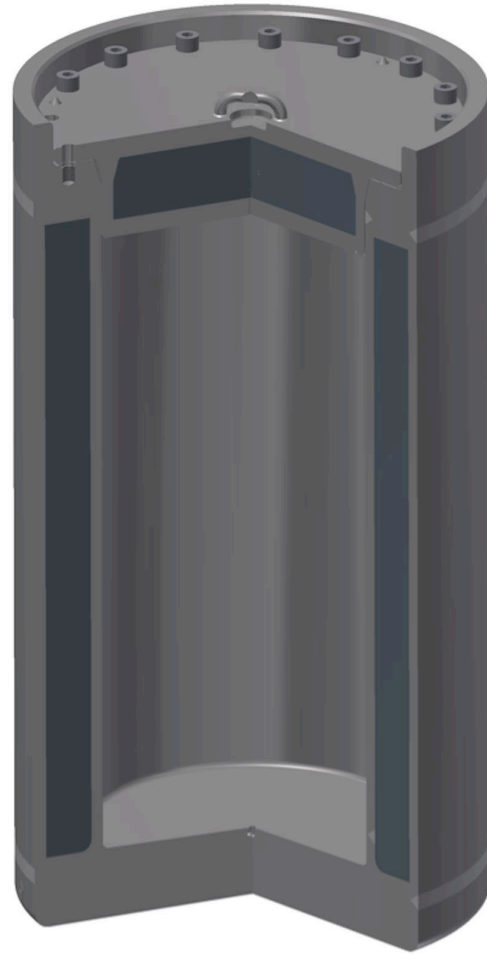


Description of Clinton LTAs

- Both ARMOR & IronClad
- GNF2 Fuel Design
- Segmented Lead Test Rods
- Both **Fueled** and **Unfueled**
- Similar to Hatch 1 LTAs



Description of GE2000 and High Performance Insert



Licensing Strategy

- Shipment of irradiated ATF fuel rods is similar to the previous NRC approved GE2000 (Docket 71-9228) contents in Rev. 26 of the Certificate of Compliance (CoC) [ML14245A208]
- Irradiated fuel rods is not part of the current NRC approved GE2000 CoC (Rev. 27) [ML18102B446]
- Current GE2000 licensing effort will focus on adding irradiated fuel rod content similar to the CoC Rev. 26

GE Model No. 2000 CoC Rev. 26

5.(b) Contents

(1) Type and form of material

- (i) Irradiated fuel rods, which may be cut or segmented.

5.(b) (2) Maximum quantity of material per package

Not to exceed 5,450 lbs, including fuel baskets, carrier racks, shoring, and secondary containers.

- (i) For the contents described in 5(b)(1)(i):

600 watts decay heat; and

Fissile contents not to exceed 1175 grams U-235 equivalent mass with initial enrichment not to exceed 5 weight percent in the fissile isotope; minimum pellet diameter of 0.3 inch, maximum burnup of 45 GWd/MTU, and minimum cooling time of 120 days; or

Fissile contents not to exceed 1750 grams U-235 equivalent mass with initial enrichment not to exceed 5 weight percent in the fissile isotope; minimum pellet diameter of 0.35 inch, maximum burnup of 38 GWd/MTU, and minimum cooling time of 120 days. Fuel rods must be contained in closed, 5-inch schedule 40 pipe, with a maximum of 437.5 grams U-235 equivalent per pipe; or

Fissile contents not to exceed 242 grams U-235 equivalent mass with initial enrichment not to exceed 5 weight percent in the fissile isotope; minimum pellet diameter of 0.3 inch, maximum burnup of 52 GWd/MTU, and minimum cooling time of 180 days.

Licensing Strategy

- Periodic Meetings with NRC
- Amendment of GE2000 SAR
- Planned Submittal 2019
- Requested NRC Approval 2020