Lightbridge®

Advanced Nuclear Fuel Technology for Current Large Reactors and Coming Small Modular Reactors

Improving reactor safety and economics

NASDAQ : LTBR

Safe Harbor Statement

With the exception of historical matters, the matters discussed in this presentation are forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995, including statements regarding the timing and outcome of research and development activities and other steps to commercialize Lightbridge Fuel™, the Company's entry into commercial utility agreements, the future development and utilization of nuclear power, government support and funding for nuclear power, and the Company's anticipated financial resources and position, including the adequacy of the Company's current cash for operations to the end of 2021. These statements are based on current expectations on the date of this presentation and involve a number of risks and uncertainties that may cause actual results to differ significantly from such estimates. The risks include, but are not limited to: the Company's ability to commercialize its nuclear fuel technology; the degree of market adoption of the Company's product and service offerings; market competition; dependence on strategic partners; demand for fuel for nuclear reactors; the Company's ability to manage its business effectively in a rapidly evolving market; changes in the political environment; risks associated with the further spread of COVID-19, including the ultimate impact of COVID-19 on people, economies, and the Company's ability to access capital markets; the outcome of the arbitration with Framatome and dissolution of the Enfission joint venture; as well as other factors described in Lightbridge's filings with the Securities and Exchange Commission. Lightbridge does not assume any obligation to update or revise any such forward-looking statements, whether as the result of new developments or otherwise, except as required by law. Readers are cautioned not to put undue reliance on forward-looking statements.

In what form do you wish to receive HALEU (e.g., UF6, metal, oxide)?

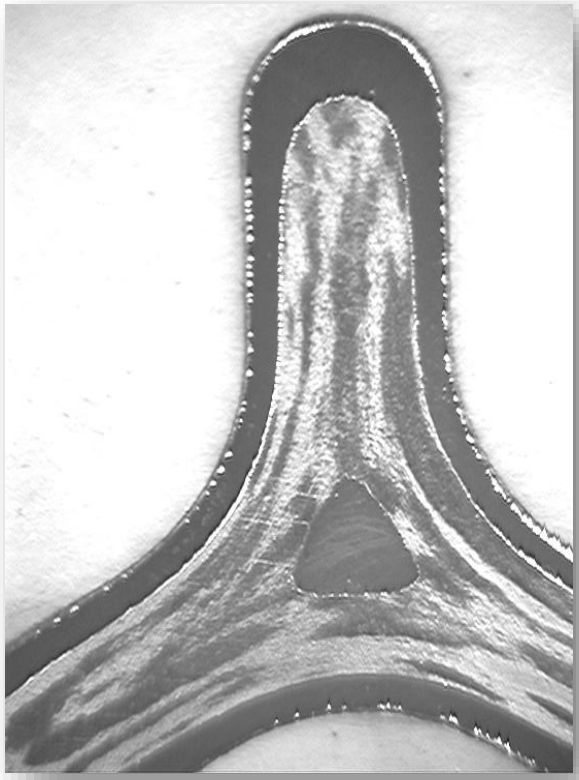
- For fuel fabrication efforts Lightbridge Fuel™ is best served by HALEU in metallic form
- Metallic form is best suited to Lightbridge Fuel™ since the fabrication process begins with alloy formation
- The alloy is approximately 50% by weight uranium and zirconium
- The most direct path to the alloy is via metal input

Brief overview of the technology

- Advanced Nuclear Fuel Technology – Lightbridge Fuel™
  - Metallic High Assay Low Enriched Uranium (HALEU) fuel for power uprates and longer fuel cycles
  - Helically-twisted multi-lobe geometry
  - Can be used in existing or new PWR, BWR, VVER, CANDU, and water-cooled SMR plants.
  - Improves economics and reduces used fuel volume.
  - Improves safety and enhances proliferation resistance.

Lightbridge Fuel™ Features

- **Absence of spacer grids** reduces core pressure drop by ~50% which improves natural circulation of the water coolant
- **Metallurgical bond** between fuel components significantly reduces the consequences of cladding breach due to fuel-cladding mechanical interactions
- **Increased cladding thickness** at lobes increases the durability of the fuel at the contact points
- **Absence of fuel-clad gap** eliminates the mechanism for widespread coolant-cladding interaction on the inner cladding surface
- **Coextrusion fabrication process** eliminates several possible sources of manufacturing defects (e.g., pellet chipping)



Cross-section of tri-lobe fuel sample for hexagonal fuel assembly

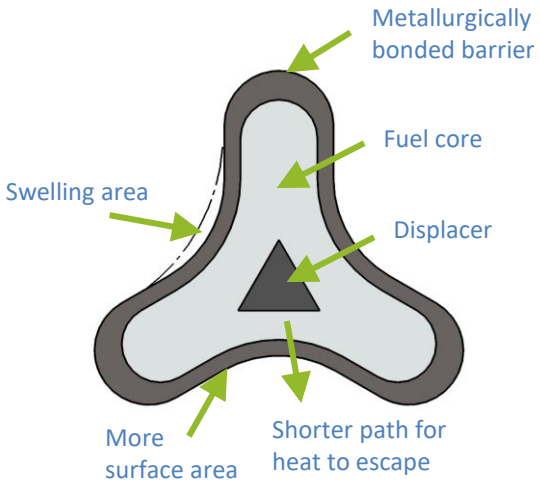
How We Design Safer Fuel

Fabrication

The three components of Lightbridge Fuel™ are metallurgically bonded during the fabrication process. This bonding **improves fuel rod integrity and thermal conductivity** and **eliminates a source of fission product release** in the event of a bonded barrier breach, **reducing radiation exposure to plant workers and the public**.

Shape

Helical multi-lobe fuel rod – increased fuel surface area and shorter distance for heat generated in the fuel rod to reach the water **improves coolability of the fuel**. Swelling occurs primarily in the valleys between the lobes, maintaining the fuel rod diameter.



Materials

1. Displacer: contains burnable poison alloys for neutronics control.
2. Fuel core: uranium-zirconium alloy, high thermal conductivity, low irradiation-induced swelling.
3. Metallurgically bonded barrier: corrosion-resistant zirconium-niobium alloy, variable thickness provides increased protection at lobe tips.

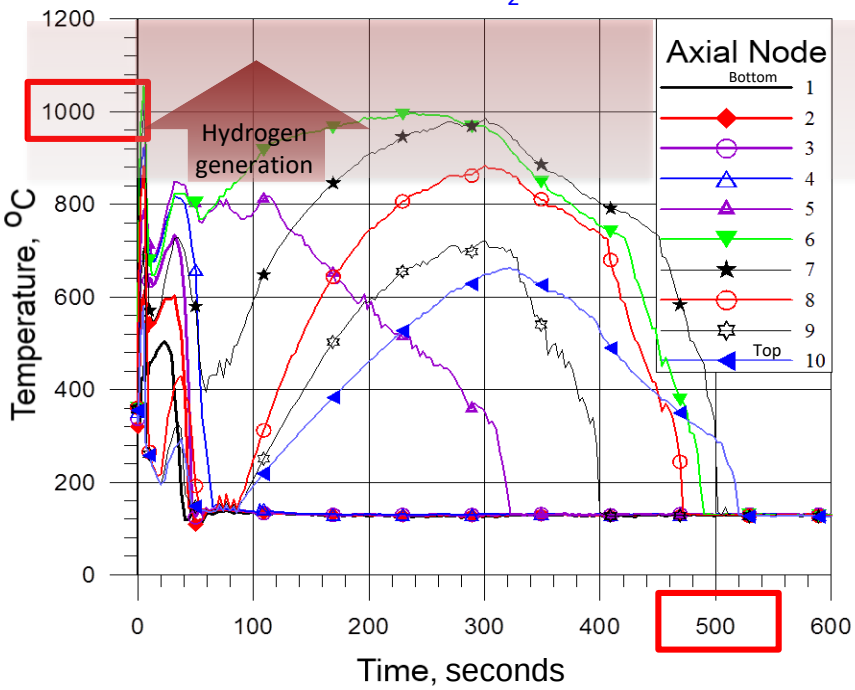
Operations

Low fuel operating temperature, fission products behave like solids and remain where they are created. **No fission product release is anticipated during design basis events.**

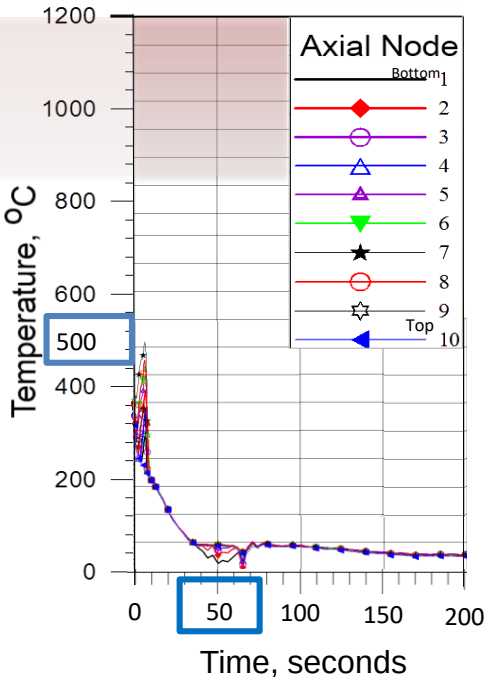
What Happens in a Loss of Coolant Accident[1]

The graphs show the peak cladding temperature (PCT) at several points along the length of the fuel during the accident for both conventional uranium dioxide fuel and the outer surface of Lightbridge-designed metallic fuel rod operating at ~30% higher power density.

Current UO_2 fuel[1]



Lightbridge fuel[2]



The cladding heats up enough to allow for steam-zirconium reactions which can generate explosive hydrogen gas at approximately 850°C. It takes ~8 minutes for the cladding temperature to decrease to the coolant water temperature.

For Lightbridge fuel, due to its low temperature and high thermal conductivity, the outer surface temperature decreases to the coolant temperature in less than a minute.

[1] Simulated design basis large break loss of coolant accident (LBLOCA) in a VVER-1000. VVER-1000 fuel 448 W/cm (13.6 kW/ft). VVER-1000 is a Russian-designed type of pressurized water reactor.

[2] Lightbridge tri-lobe fuel – 550 W/cm (16.7 kW/ft)

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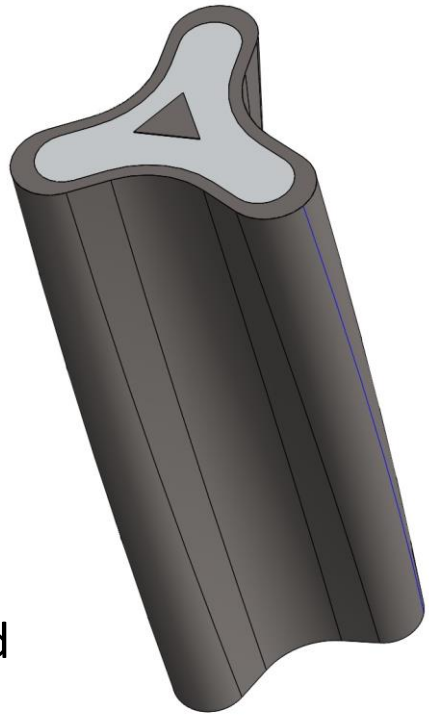
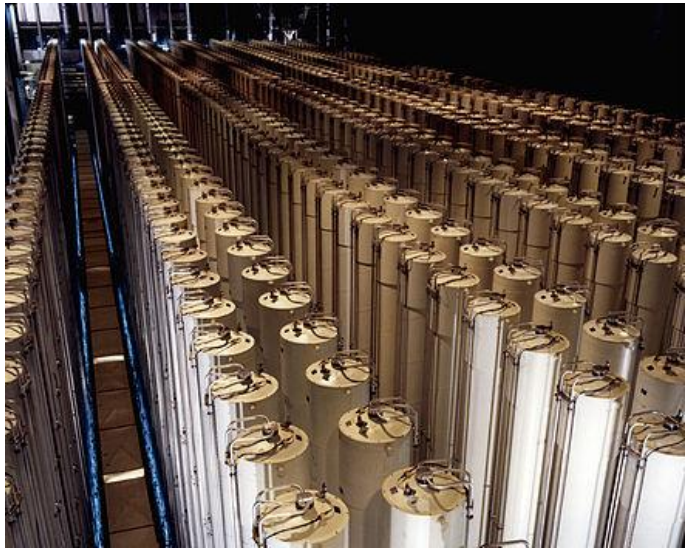
Benefits of Lightbridge Fuel™

- ✓ Supports existing fleet by improving the economics and safety
  - Extends fuel cycle lengths – up to 24 months
  - Reactor power uprate – up to 30%
  - Low incremental levelized uprate cost of electricity
  - Increases fuel burnup
- ✓ Provides the earliest and largest scale deployment of HALEU (with enrichments up to 19.75%)
- ✓ Provides a bridge between the currently deployed power reactor technologies and the next generation of advanced nuclear reactors



Challenges

- HAELU Enrichment Capacity
  - Infrastructure and regulatory licensing for supply of HALEU in commercial quantities
  - Lightbridge Fuel™ requires 50% more SWU/GWd than conventional UO2 designs
- Commercial scale conversion to U Metal at
  - Acceptable cost
  - Lab scale quantities are available today
  - Process enhancement needed to provide required annual quantities



Timeline for HALEU

Near term, large scale commercial user of HALEU

- Enrichment capacity infrastructure requirements:
  - Estimated demand of ~7.9 million SWU at 18.6% w/o by 2035
- Commercial scale conversion to U metal (i.e., metallization) infrastructure requirements:
  - Estimated cumulative HALEU needs for Lightbridge ≈ 331 MTHM by 2035
  - Expected to reach 100+ MTHM per year by 2036

What role do you see for the U.S. government to support the development of HALEU infrastructure?

- The government can enable the use of HALEU by working with industry to commercialize production of HALEU in different forms (Metallic, U3O8, UF6)
- Sharing transportation technology and facilitating interactions between the industry and the Nuclear Regulatory Commission
- Support the HALEU efforts to enable use of up to 19.75 w/o U235
- Support industry efforts to maintain criticality control

Are there legislative proposals that you prefer?

- SJ 60 Nuclear energy; advancement of nuclear energy research & exploration of economic opportunities (the resolution)
  - Encourages the advancement of nuclear energy research and the exploration of economic development opportunities related to nuclear energy.
- SB 549 Nuclear energy; strategic plan for overall goal of carbon-free energy
  - Nuclear energy; strategic plan. Directs the Department of Mines, Minerals and Energy, the Secretary of Commerce and Trade, and the Secretary of Education to work in coordination with the Virginia Nuclear Energy Consortium Authority and the Virginia Economic Development Partnership Authority to develop a strategic plan for the role of nuclear energy in the Commonwealth's overall strategy for moving toward renewable and carbon-free energy. The plan shall be completed by October 1, 2020, and updated every four years thereafter.

Are there legislative proposals that you prefer

- HB 1303 Nuclear energy; strategic plan for overall goal of carbon-free energy
  - House version of SB 549
- SB 828 Carbon-free energy and clean energy; definition
  - Provides that "carbon-free energy" or "clean energy," as used in the Code of Virginia, includes electric energy generated from a source that does not emit carbon dioxide into the atmosphere during the process of generating the electric energy, including electric energy generated by the conversion of sunlight, wind, falling water, wave motion, tides, or geothermal or nuclear energy.

Are there legislative proposals that you prefer

- SB 817 Nuclear energy; considered a clean energy source
  - **Nuclear energy; considered a clean energy source.** Provides that for the purposes of the Commonwealth Energy Policy, in any clean energy initiative or carbon-free energy initiative undertaken, overseen, regulated, or permitted by the Department of Mines, Minerals and Energy, nuclear energy shall be considered to be a clean energy source.

Aligning and Combining Federal and State Efforts

- Virginia's State Senate and House have passed legislation supporting nuclear power and including nuclear power in the definition of Clean Energy
  - Encouraging other states and the federal government to adopt Virginia's position on nuclear power will eliminate an argument often used against nuclear power, i. e., it is not renewable and cannot be a part of a Green Energy Plan.

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