Lightbridge®

NASDAQ: LTBR

Part of the WNA Nuclear Energy Index

Technical & Economic Advantages of All-Metal Fuel

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Lightbridge at a Glance

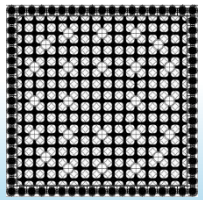
- Lightbridge Corporation (Nasdaq: LTBR) is developing next generation nuclear fuel technology and is a leading provider of nuclear energy consulting services to commercial and governmental entities worldwide
- Technology licensing business model enables partnership opportunities with major fuel fabricators and provides immediate access to their existing customer bases to maximize the technology's market penetration
- R&D program focused on positioning the fuel technology for a commercial arrangement with one or more major fuel fabricators over the next 2-3 years
- Growing advisory services business provides revenue stream and access to potential clients for fuel technology business
- Headquarters: McLean, VA, USA
- Branch Offices: Abu Dhabi, Moscow, UK

Lightbridge – How We Fit in the Nuclear Space

Fuel Technology Business

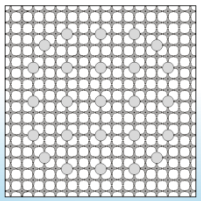
All-Uranium Seed & Blanket Fuel Design

- 10-17% power uprate and longer fuel cycles in Westinghouse-type 4-loop plants
- Technology best suited to currently operating light water reactors



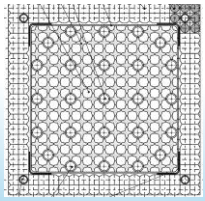
All Metal Fuel Design

- 30% or greater power uprate
- Technology best suited to new build light water or small modular reactors



Thorium-based Seed & Blanket Fuel Design

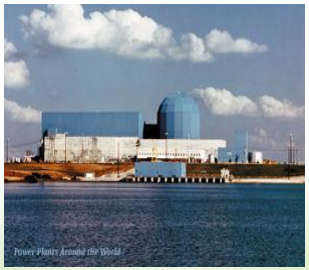
- Leading developer of thorium-based , enhanced proliferation resistant nuclear fuel designs
- Addresses key concerns of proliferation, waste reduction and fuel supply



Advisory Services Business

Nuclear Generation

- Industry leading team
- Comprehensive advisory services for nuclear programs



Nuclear Regulation

- Leading regulatory team
- Advisory services on design, development and management of nuclear energy programs according to highest int'l standards

Industry Trends in Established Nuclear Markets

- The growth of nuclear power is facing major obstacles that must be addressed, including:
  - Low cost natural gas in the US (shale gas)
  - Significant upfront capital cost of new build nuclear power plants,
  - Regulatory uncertainties
  - Fuel limitations
  - Used fuel management issues
- **Power uprates and longer fuel cycles** have become favored industry options for increasing nuclear power generation from existing reactor fleets as it is faster **(months vs. years)** and less expensive **(overnight cost of under $1,200 per kWe; over 70% cheaper)** than building new reactors
- Next generation fuel designs capable of higher power density are required for greater power uprates and longer fuel cycles

Industry trends in established nuclear markets point toward power uprates and longer fuel cycles as the growth engine in the foreseeable future

Industry Trends in Emerging Nuclear Markets

- Key priorities are the most efficient use of capital and increasing supply chain throughput for new build reactors
- Next generation fuel designs capable of higher power density are required for increased power output with the same core size and plant footprint:
  - Greater power output from the same core size reduces average overnight cost per kilowatt and operations & maintenance costs per MWh for new build reactors
  - Additional nuclear capacity brought into operation faster
  - Existing supply chain can deliver more power from the same capacity
  - No changes to current pressure vessel forging capability required

Industry trends in emerging nuclear markets point toward efficient use of capital and supply chain infrastructure by increasing power production per dollar invested

Fuel Technology Business

Value Proposition of Lightbridge's Proprietary Fuel Technology

Increased Power Output from Plant

- 10-17% power uprate and longer fuel cycles for existing PWRs
- Up to 30% power uprate for new build PWRs

Improved Plant Economics

- Increased revenue and improved operating margins of existing nuclear power plants
- Reduced total levelized cost per kilowatt-hour for new build reactors, including 50-98% reduction in incremental capital cost per kW vs. new build
- Increased competitiveness of nuclear power versus other energy sources

Increased Supply Chain Efficiency

- Fuel enables the supply chain to deliver more power from the same capacity
- Reduced fuel fabrication costs

Improved Used Fuel Management

- Reduced volume of used fuel
- Enhanced proliferation resistance of used fuel

Lightbridge's Metallic Fuel Technology Product Line:

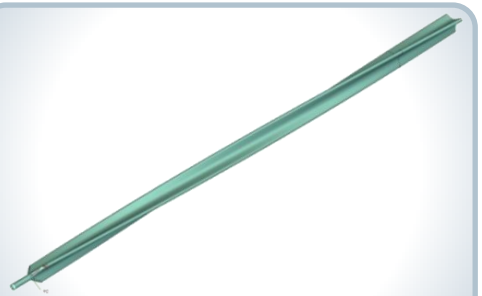
LTB17-1024™:
All-uranium seed and blanket fuel for 10% power uprate and longer fuel cycle in existing PWRs

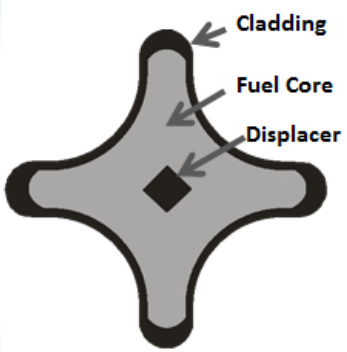
LTB17-1724™:
All-uranium seed and blanket fuel for 17% power uprate and longer fuel cycle in existing PWRs

LTB17-3018™:
All-metal fuel for 30% power uprate in new build PWRs

LTB17-Th18™:
Thorium-based seed and blanket fuel for improved used fuel management

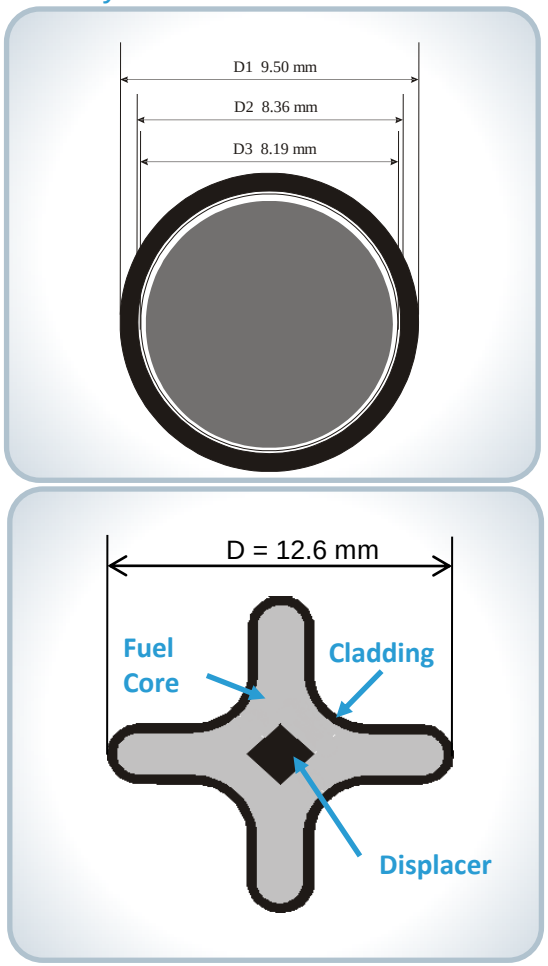
Lightbridge's Metallic Fuel Technology





All-Metal Fuel Rod Comparison

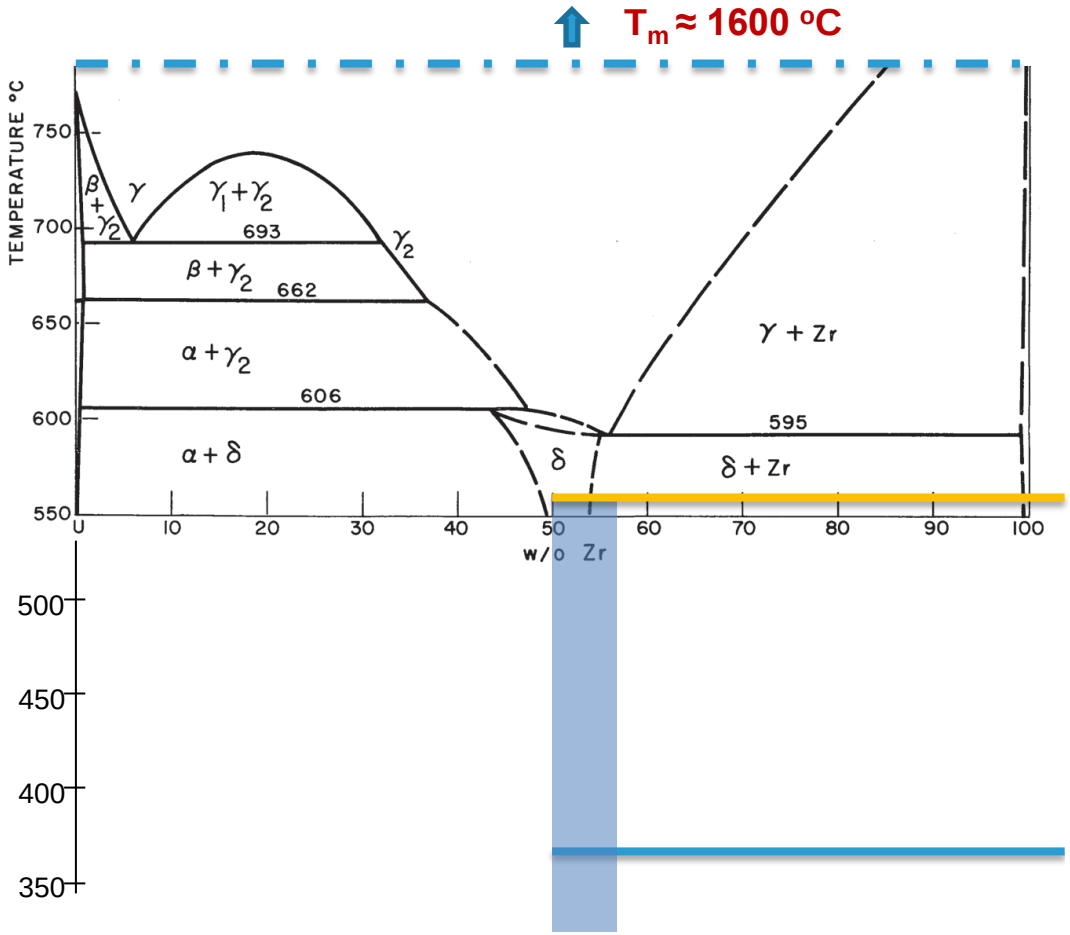
Standard Cylindrical Oxide Fuel Rod Cross-Section



Lightbridge metallic fuel rod cross-section

- Zr-U binary alloy fuel core is metallurgically-bonded to Zr-1Nb cladding, no plenum
- Multi-lobed design provides ~35-40% increase in surface area
- Helically-twisted fuel rod provides increased coolant mixing
- Self-spacing of fuel rods eliminates the need for fuel rod spacer grids and significantly reduces fuel assembly hydraulic resistance
- Fuel assembly is mechanically compatible with existing 17x17 PWR designs

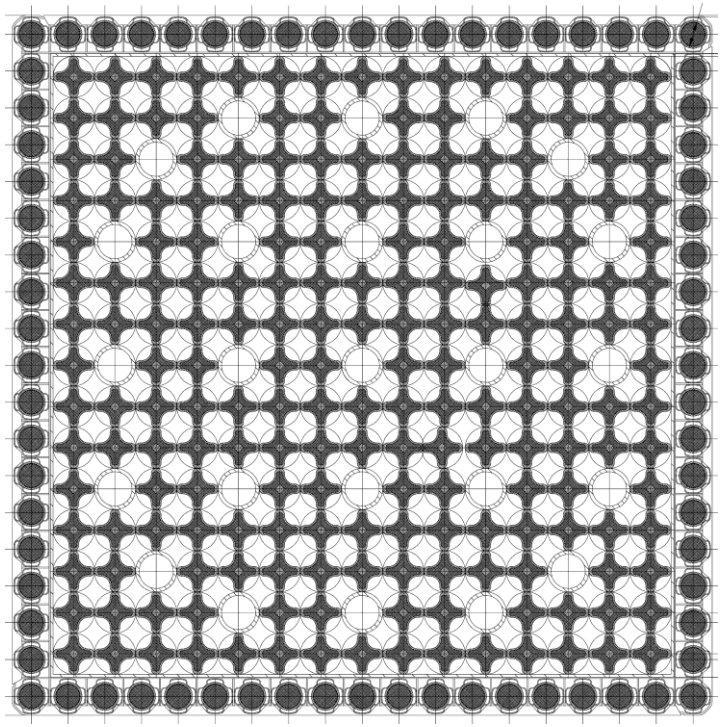
U-Zr Phase Diagram & Lightbridge Metal Fuel Operating Temperature at 130% Power Density



Uranium-Zirconium phase diagram. "Constitution of the Uranium-rich U-Nb and U-Nb-Zr systems", Dwight & Mueller, ANL-5581 (modified)

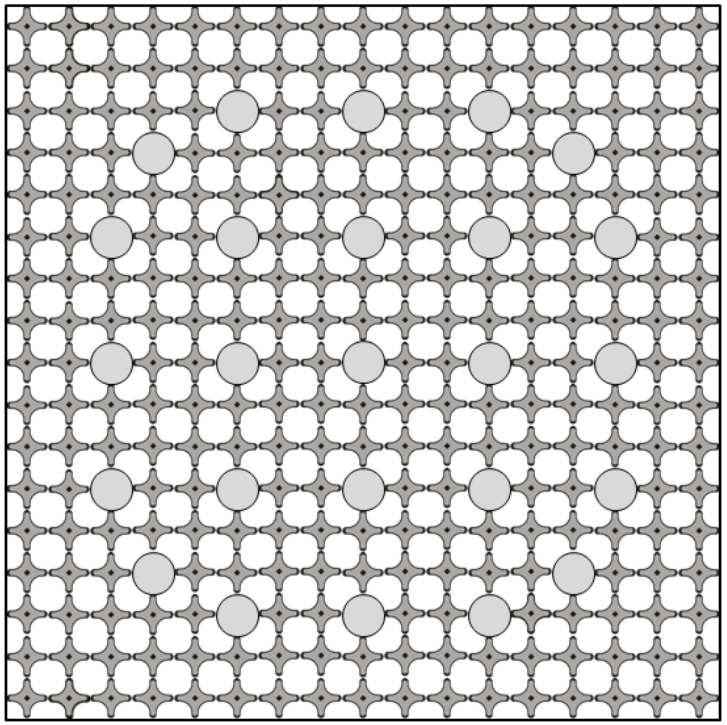
All-Uranium Seed & Blanket Fuels

- Lightbridge's metallic fuel rod in the central seed region and conventional UO_2 rods in the outer blanket region.
- Developed for power uprate in existing PWRs
- Capable of extending the length of fuel operation and increased reactor power output.
- Evolutionary fuel designs building on Lightbridge's thorium-based seed and blanket fuel development program:
  - LTB17-1024™ (10% uprate / 24-month cycle)
  - LTB17-1718™ (17% uprate / 18-month cycle)

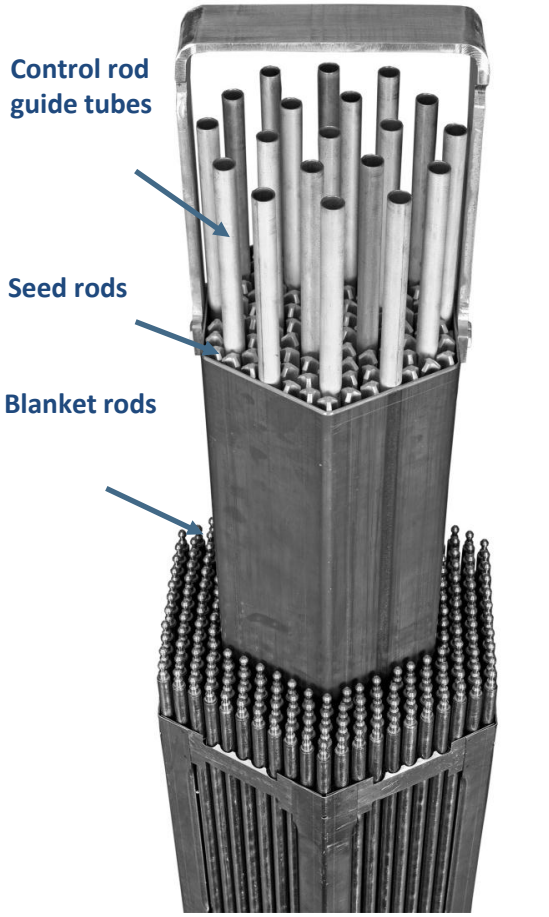


Lightbridge All-Metal Fuel for up to 30% Power Uprate

- Utilizes Lightbridge's metallic fuel rods in the entire fuel assembly
- New-build reactors are most suited to take advantage of the full power uprate potential offered by the Lightbridge metallic fuel rod design
- Any necessary upgrades to reactor and NSSS components can be more easily and less expensively implemented during plant construction
  - LTB17-3018^{TM} (30% uprate / 18-month cycle)



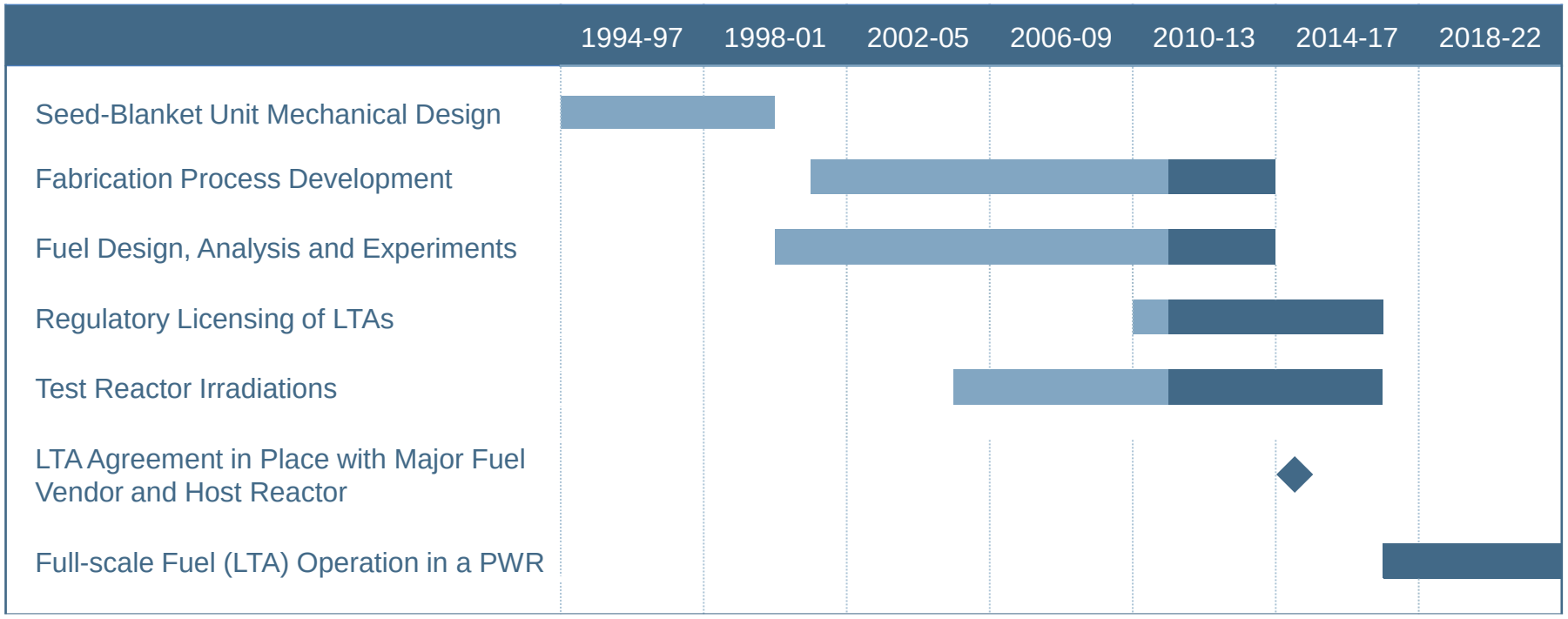
Thorium-based Seed and Blanket Fuels



Lightbridge thorium-based seed and blanket assembly model for VVER-1000 reactors

- Once-through fuel cycle based on patented seed and blanket fuel assembly design that efficiently utilizes thorium
- Full compatibility with existing LWR designs
- Enhanced proliferation resistance of the used fuel
- Reduced natural uranium requirements - up to 10% natural uranium savings
- Reduced volume (up to 40%) and long-term radio-toxicity (up to 90%) of used fuel
- Reduction in fabrication costs due to reduction in fuel rod requirements

Lightbridge Nuclear Fuel Development Timeline



Current development efforts are focused on demonstration of LTB17-1718™ that allows advancement of all four product families in Lightbridge's metallic fuel product line

Upcoming Technology Demonstrations

- Programs are currently being planned with initial start date for irradiations in 2012.
- Irradiations
  - PWR loop irradiations to target burnup
  - Capsule irradiations in the ATR NSUF with Texas A&M University
- Tests & Measurements
  - Basic properties measurements (burnup dependent)
  - Accident response
    - RIA, LOCA, power ramp

Summary

- Lightbridge is a Fuel Tech IP Company with a robust Consulting Division
- Power Uprates and Longer Cycles are important to utilities in mature nuclear countries
- Lightbridge Fuel Technology Division Products
  - High Power Density Metallic Fuel Supports
    - Power Uprates
    - Longer Cycles
    - 30% or greater increase in output for new build
  - Thorium-based Fuels

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Thank you