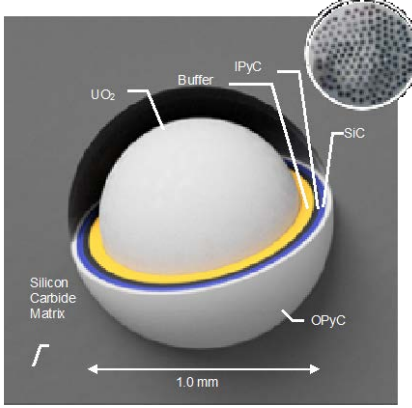
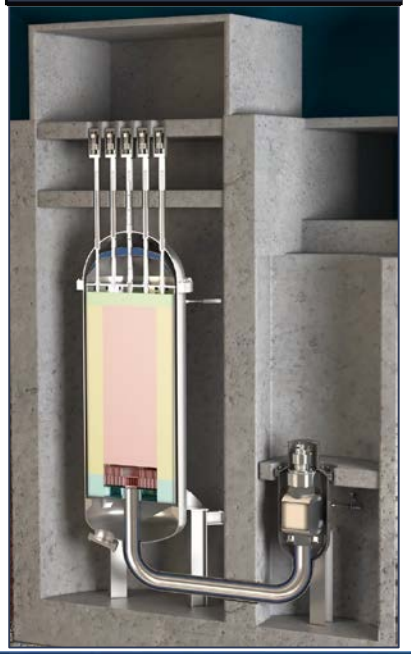
USNC and MMR™ Overview



FCM: TRISO fuel particles encased in SiC



USNC Company background

- Founded in 2011 as a spinoff from the DOE Labs
- Fully privately funded US company
- Our head office is in Seattle WA, we have 50+ people. Operations in Canada, UK and South Africa

USNC key technology

- **FCM™ fuel** – Most robust nuclear fuel form – originated from DOE Deep Burn Program
- **MMR™** – micro modular gas-cooled reactor

The MMR Energy System

- Prismatic gas-cooled Nuclear reactor fueled with FCM™ fuel pellets
- FCM™ coupled with conservative operating conditions are at the core of the MMR™ passive safety case
- Each unit is designed to provide 5 MWe for 20 years without refueling
- Uses commercial components with existing suppliers and supply chains
- Teaming with Ontario Power Generation for first unit at the Canadian Nuclear Laboratory.
- First Unit MMR-REM in advanced licensing procedures in Canada – First Power in 2024

USNC First Generation MMR™ Needs from the DOE

- Low DPA graphite irradiation of available nuclear graphite
- V&V of computational tools for graphite analysis code and mechanistic source term
- USA supply of HA-LEU TRISO fuel
- Use of High Performance Computing facilities for detailed analysis
- Access to and maintenance of current-generation DOE nuclear design software
- Risk informed approach and NRC licensing cost estimates to better understand cost of licensing micro-reactors in the US

Growth Path Needs From the DOE

- High-temperature pressure vessel qualification
- High-temperature, high pressure heat exchangers (>900 C)
- Cross-section generation and thermal scattering data for high-temperature hydrides and other advanced moderators
- 3rd party verification of advanced designs
- Facilities that enable accelerated design to build:
  - Testing of in-core components in Porto-typical conditions without needing to build a full reactor systems.
  - Location for low power, low source term proof-of-concept builds
- Long term waste disposal certainty
- Be supply chain and regulations for use in mobile reactors
- High DPA irradiation facilities