



ULTRA SAFE NUCLEAR CORPORATION

MMR: An Overview

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SNETP FORUM

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Ultra Safe Nuclear Corporation

Background

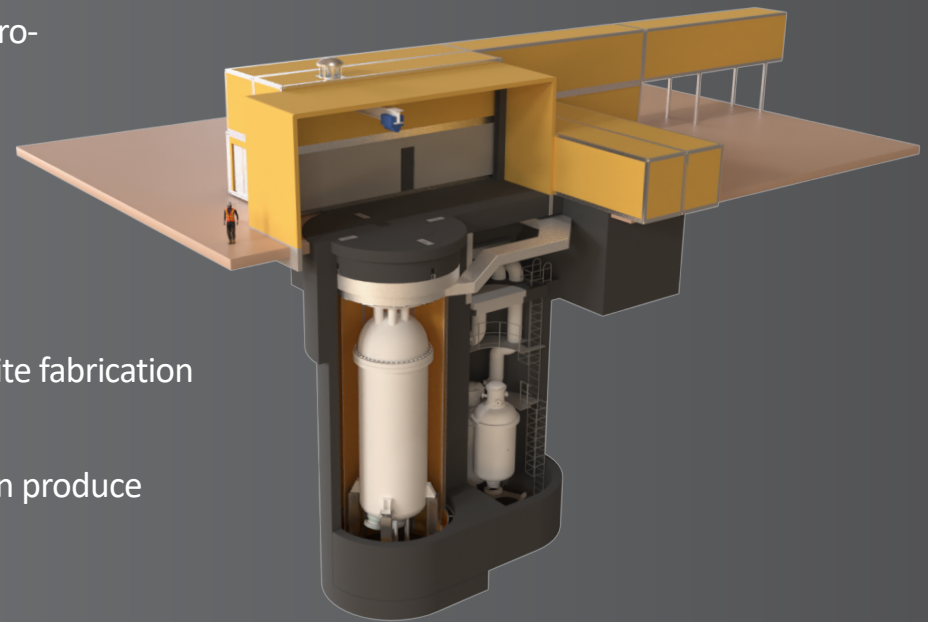
- Founded in 2011, privately funded, \$50m investment to date
- Formed Canadian subsidiary USNC Power, headquartered in Ottawa
- Developer of the small-scale Gen IV Micro Modular Reactor (MMR™) system
- Multiple patents for ceramic micro-encapsulated nuclear fuel
- Specifically developed the MMR™ for off-grid, northern/remote application in Canada
- Designed for safe, clean, cost-effective energy with no refuelling for 20 years
- Leading SMR in the CNSC licensing process



The Ultra Safe Nuclear Solution

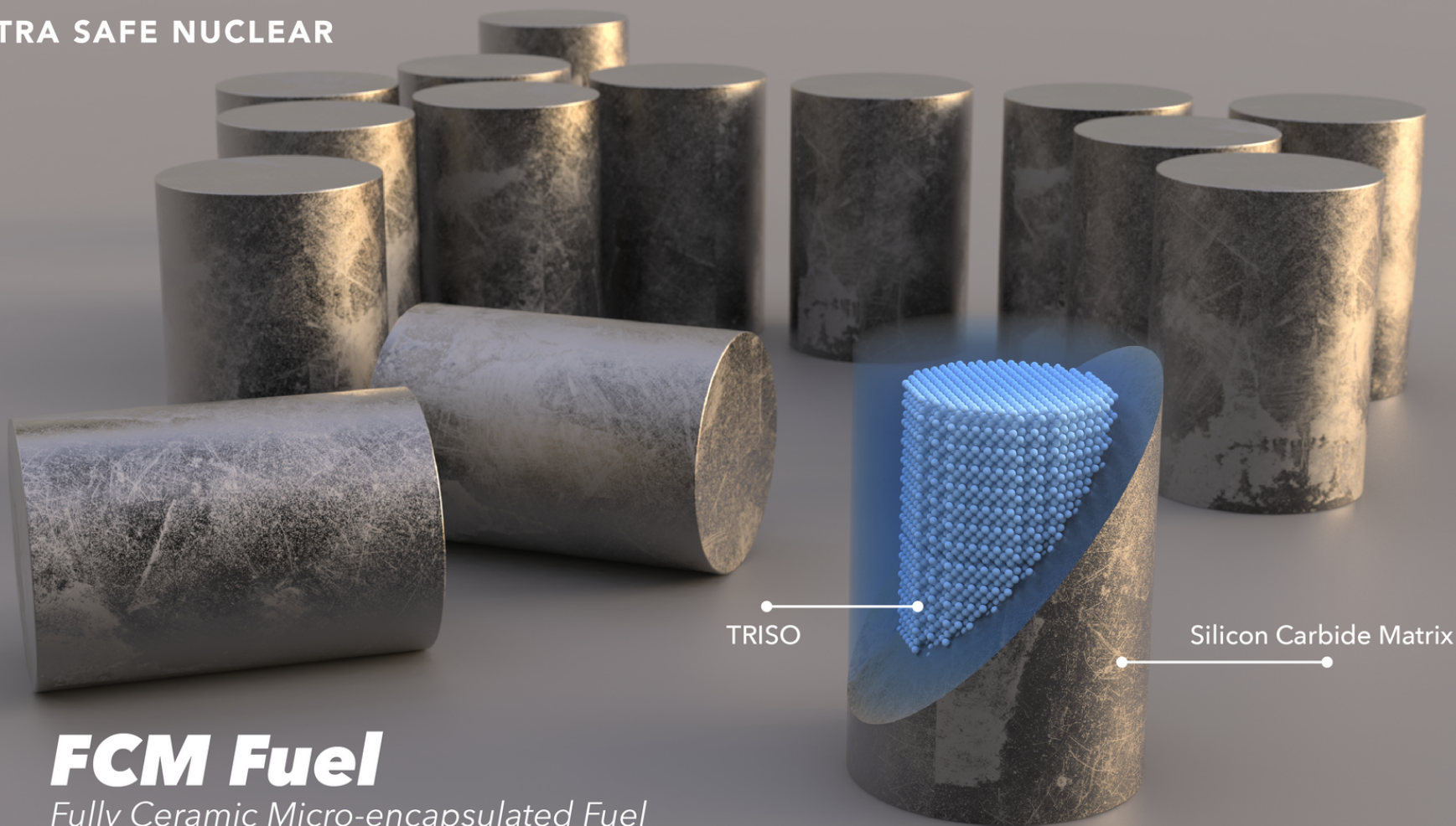
Gas-cooled MMR™

- Transformative fuel technology using fully ceramic micro-encapsulated (FCM™) fuel
- 5 MW to 50 MW plant size (electrical)
- Fueled once for 20-year life, mitigating supply risk
- Meltdown-proof with no safety risks
- Designed for Arctic conditions
- Modular design allows for rapid construction and off-site fabrication
- Fraction of the capital cost of traditional nuclear plants
- Flexible design outputs electricity, process heat and can produce hydrogen
- Minimal waste aligns with national plans for disposal





ULTRA SAFE NUCLEAR



FCM Fuel

Fully Ceramic Micro-encapsulated Fuel

Molten Salt Intermediate Heat Transport Loop

- Eliminates water ingress, chemical attack and fission product wash off
- Allows for heat storage which decouples the primary circuit from the load



MMR™ Energy System

Layout for Remote Off-grid

Thermal Power

30 MWt (15 x2)

Electrical Power

10 MWe (5 x2)

Lifetime

20 years

Refueling

20 years



Adjacent Plant

Nuclear Plant

Turbine

Air Cooled
Condensers

Steam
Generator

Molten Salt
Heat Reservoir

Helium Circulator

Nuclear
Reactors

Learn more about MMR
technology on your iOS or
Android device.



Progress to executing Canada's First SMR Project

- Vendor design review with the CNSC is entering Phase 2.
- Agreement to site at CNL/AECL has been signed
- Active application for an Environmental Assessment and License to Prepare Site
- Partnership established with OPG through GFP to build, own, and operate the plant
- Schedule brings Canada's first SMR into operation by 2026 or earlier
- Advancing Canada's SMR Action Plan and decarbonization goals before 2030 (one 5 MW MMR™ can replace 220 million of litres of diesel)
- 80 per cent of project expenditures to be spent in Canada
- Job creation estimated at 400 (direct) and 1,000 (indirect) by 2022



ONTARIOPOWER
GENERATION

USNC
ULTRA•SAFE•NUCLEAR

GLOBAL
FIRST POWER



MMR in Canada : Project Goals

- Demonstrate the benefit of SMRs
 - Solution to help achieve Canada's climate change goals
- Demonstrate the value of SMRs
 - Cost-effective option to help solve energy challenges for heavy industry
- Potential launch pad for Canadian export opportunities
- Ultimately, enable future SMR projects
- GFP's goals include demonstrating and building confidence in:
 - Project business model
 - Commercial model for potential market
 - Licensing and regulatory precedent
 - MMR™ technology
 - Project delivery - cost, schedule and operational performance
 - Long-term cost of power



Project Schedule

2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Project Commencement <ul style="list-style-type: none"> • Submit project description • Submit application for licence to prepare site 	Preliminary Planning <ul style="list-style-type: none"> • Concept and definition of design • Determine final site location on CRL lands 								
	Environmental Assessment <ul style="list-style-type: none"> • Conduct studies • Prepare Environmental Impact Statement 								
	Project Development <ul style="list-style-type: none"> • Perform detailed design and engineering • Application and approval of regulatory licences required for Site Preparation, Construction and Operation 					Commission and Commence Operations <ul style="list-style-type: none"> • Operation for 20 years • Maintain licence to operate 			
				Site Preparation and Construction <ul style="list-style-type: none"> • Clear and prepare the site • Construction (approx. 1 year) 					
	Indigenous, Public and Stakeholder Engagement <ul style="list-style-type: none"> • Ongoing outreach and communications on environmental assessment and licensing activities and project status • Opportunities for stakeholder and public input on GFP's project and during regulatory and licensing processes 								

The MMR™ Business Case for Remote Canadian Sites

- Major sustainability initiatives underway in the resources industry to act on climate change through reducing carbon emissions
- Renewable alternatives cannot reliably replace fossil fuels
- Most other SMRs are targeting on-grid application (replacement capacity)
- MMR™ is near term (mid-2020s) to support carbon reduction objectives
- Reliable carbon-free energy at lower energy costs compared to diesel
- Mitigation of energy supply and cost risks
- Federal and provincial support for Small Modular Reactors (SMRs)
- MMR™ will eliminate millions of tonnes of CO2 emissions





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