



A Touchstone Energy[®]Cooperative 🏂

Travis Million

CEO

February 23

RELIABLE ZERO-CARBON ENERGY ANYWHERE

Agenda

Feasibility Study Results

Why Nuclear for Copper Valley

- Board Strategic Plan
 - Develop a plan to reduce use of diesel fuel
- Increasing, fluctuating winter energy costs
- Reduction in emissions from fossil fuel power plants
- Lack of solutions for winter energy
 - CVEA has looked at and found the following not to work well for us: Wind, Solar, Geothermal, Biomass, Hydro, Intertie, etc.

Diesel Fuel Costs January 1, 2021 -March 28, 2022

Micro Modular Reactor MMR[™] Energy Systems Overview

• Scalable and Flexible

- Standardized factory-produced units commercial offthe-shelf parts (COTS)
- · Mass-production drives steep cost reductions
- Projects scalable with multiple units
- Flexible configurations to serve any customer
- Energy cost visibility

• Easy to Assemble

- 85% of construction costs in factory
- Units are tested in approved factory before delivery
- Modules are transported and assembled on site
- Walk away AND walk back safe

• Easy to decommission

- No environmental contamination
- No fuel storage on site
- Site is returned to green field after operations
- Waste forever contained in FCM

Competitive Advantage

- Proprietary patented MMR and FCM technology
- Vertical integration with strong regulatory barriers

Pre-Feasibility Study Scope & Purpose

Questions the pre-feasibility study is intended to answer

- Is there anything that would prevent siting an MMR here? Nothing yet
- What are the preferred sites and their characteristics?
 - Near existing electrical facilities, out of the tsunami zone
- What are the cost parameters and decision points?
 - Will the cost be less than diesel generation and sustainable for the long term
- What are the benefits, concerns, and issues for the community?
 - Benefits long term lower cost of power
 - Concerns safety, environmental impact, waste disposal
- What operating specifics might apply in locating an MMR here?
 - Road access, isolated grid, workforce

CVEA, Ultra Safe Nuclear, contracted a local engineering firm for the study that knows the area utilities, power grid, customers and community factors well.

If selected, Valdez would be the Serial 003 MMR project (after Chalk River, UIUC)

Pre-Feasibility Study Process Overview

Study Announced Study Study Development Pre-Feasibility **Report Delivered Board Consideration** Additional Information Public Meetings Feb Jun Jul Sep Oct Nov Dec Jan Feb Mar Mar Apr May Aug

Pre-Feasibility Study Timetable

Milestones

- Collaboration on Pre-Feasibility Study announced February 2, 2022
- Contracted with Alaska engineering firm (EPS) familiar with generation and power grid
- Study delivered to CVEA October 2022
- Internal economic analysis performed December 2022
- Board review and consideration October 2022 & January 2023

Stakeholder Engagement

Engagement Timetable

Beyond Public Acceptance

- Participatory approach and space
- Diverse perspectives and values
- Opportunity for creative solutions

Stakeholder Engagement

- Outreach conducted primarily in Copper Valley basin and Valdez with local elected officials, Native Alaskan Communities, NGO's, industry and any interested public
- Preliminary conversations didn't show any significant opposition to siting an MMR in the CVEA service territory and generally very supportive
- Concerns expressed were primarily on issues of safety, environmental impacts and waste disposal
- Strong desire expressed by all to remain engaged in these conversations as the feasibility study progresses to a decision

Locations (indicated by blue arrows)

- Valdez
 - Richardson
 - Harris
 - Mountain*
 - Meals*
- Glennallen
 - Near existing transmission substation
 - No identifiable use of heat

* Most suitable locations (outside of inundation zone)

Valdez tsunami inundation zone map

FINANCIALS

Electric only doesn't work economically

Evaluating eliminating fossil fuel generation (Cogen Plant)

FINANCIALS

Using MMR to replace Cogen as it is currently operating is difficult economically

Year-round heat sales at current heat production rate

FINANCIALS

Year-round heat sales used in economic analysis

Securing a buyer for year-around heat sales to maximize heat and electric

output

Conclusions

Suitable site locations

Easily integrated into current system

Public acceptance appears positive and will continue to engage broadly

Potentially economically viable

- High risk for CVEA members to own
- Board chose not to be an owner/operator of the project
- Evaluating Power Purchase Agreement (PPA) with USNC

NEXT STEPS

- Work with USNC on PPA
- Hold public meetings to share feasibility results with CVEA membership
- Final decision expected to be made late summer of 2023

QUESTIONS

Questions and Answers

*From February Public Meetings in Valdez and Glennallen

Q. How are you bringing in the fuel; are you barging or will it come through Canada?

A. We are still working on that. Canada may be a viable option as USNC has established relationships there.

Q. What is the price tag on the 10MW plant?

A. That information is proprietary. The first couple will be very expensive, but after that, when they are being mass produced, the cost per unit will be less.

Q. Why are we jumping in so early and not waiting to see how this works out for others?

A. Looking into this now, and in this way, allows for a partnership such as the one with USNC. It allows for us to work together to find a viable solution that works for our members versus waiting where we would simply be purchasing a product from a vendor.

Q. Is this a demonstration project?

A. It is not technically considered a demonstration project as, if it is brought online, it will be the third project. But, it can be considered a demonstration project for the state of Alaska. Alaska really wants to see a project like this in the state. Valdez is the ideal location because it is remote, but has access, a highway, and is an isolated grid.

Q. Does USNC have an operational unit or is all of this theoretical?

A. There are no units deployed currently in the US, but the technology has been used for many years. There are two units currently being planned for deployment; one in 2026 and one in 2027. Various components of the USNC design are currently in operation or being tested in existing reactors.

Q. What is the investment of CVEA?

A. There will be no capital investment by CVEA. The Board has opted to not own and operate the plant if the project moves forward. CVEA would only purchase power from the owner/producer via a Power Purchase Agreement (PPA)

Q. Is USNC prepared to put up the capital for this project?

A. That is currently what USNC needs to determine. They are currently assessing whether or not they want to be the owner/operator of a plant that sells power to CVEA.

Q. What is CVEA's risk or liability?

A. CVEA will have zero risk in terms of capital outlay as the Co-op will not own/operate the plant. The only risk will be locking into a long-term PPA.

Q. Who will own the land the plant will be located on?

A. The land that has been identified as a priority is currently owned by the University of Alaska. This land would be owned or leased by USNC.

Q. What if CVEA didn't wish to continue to with a long-term PPA?

A. That is always a risk with any negotiation. CVEA would hope to negotiate an 'out' clause, but that cannot be guaranteed. The goal would be to negotiate a PPA price that would be lower than any foreseeable cost of diesel fuel.

Q. How do you weigh the Alyeska Intertie benefit against the long-term PPA with USNC?

A. With the Alyeska Intertie just connecting in 2023, we have no way of yet knowing that benefit, but we believe it will be substantial. We do understand this could have an impact on the potential benefit of the MMR project. We will continue to re-evaluate our generation portfolio and needs as we learn more about the effects of the Intertie.

Q. If we had the Richardson Highway Intertie, could we sell power to others?

A. Yes, modules can be expanded and easily integrated. Excess power could then be sold.

Q. What is USNC's source of capital?

A. USNC is privately funded by a number of private and corporate investors. And there are some interested in investing in this project.

Q. Would you be running the project year-round or seasonally so you can extend the life of the fuel cells?

A. The project would run year-round. CVEA would take electricity seasonally, but heat would be sold year-round. This would still give a roughly 23-year life span for the fuel modules.

Q. Who are you contracting with for the sale of heat?

A. USNC is exploring options for sales of heat. We will share that information with CVEA and the community when any decisions are made.

Q. How do you balance risk versus reward for Valdez considering we have the plant here, and all of the concerns that go with it, but the Copper Basin will still receive the benefits?

A. This would be similar to any of the existing power plants that reside in Valdez but electricity is supplied to the Copper Basin.

Q. Can other industries take advantage of the heat?

A. Yes. USNC wants to have the ability to market to other industries. Location, however, matters. You can only push the heat roughly one mile without major losses.

Q. Does this create an opportunity to work with the State on an economic zone around it potentially?

A. There is a good chance of that. The University (ACEP) and the Governor are very supportive of this project.

Q. This seems like a good opportunity. Have you looked into the earthquake issue?

A. In general, yes. Initial seismic concerns have been answered. Once a final sight has been selected, a full seismic analysis will need to be performed. Earthquakes were specifically taken into consideration with design, and the reactor is built underground specifically to withstand earthquakes in Alaska.

Q. Your preferred site is in a liquefaction zone. How do you expect that to work?

A. This would be evaluated with additional seismic studies.

Q. Where are you at with the licensing process.

A. No licensing steps have begun at this point. That process would begin after a decision is taken to move forward with the project.

Q. Where are you getting the helium to keep it all cool?

A. Helium or other specific materials for this project would only be purchased after a decision to move forward. USNC remains confident there is a viable market and supply chain. The helium is in a closed-loop system and doesn't need a large supply.

Q. What is your waste disposal plan?

A. At the end of operations the reactor will be shutdown safely and the fuel moved into storage and transportation canisters. These will then be shipped offsite for temporary storage at a DOE or NRC licensed facility until the DOE begins disposal. Currently the DOE plans to place the canisters in a deep mine where they will be safely housed permanently.

Q. You mention that most of the feedback to this potential project has been positive; how have you gotten feedback from the membership? A. CVEA and USNC engaged in many meetings to include public meetings, a variety of community stakeholder meetings, statewide meetings, and the Cooperative's Annual Meeting. We continue to address any concerns as they arise, but in general we see encouraging expressions of interest and acceptance.

Q. What is the life expectancy for the plant?

A. Life expectancy for the fuel cell is 23 years and the plant is 40 years, with options to extend the license.

Q. Would there be a NEPA analysis?

A. The NRC licensing process includes an Environmental Assessment including public engagement. The license application is what formally starts this process.

Q. Will there be a public comment period prior to the Board's final decision on moving forward with this project?

A. Yes. There will be an opportunity for the public to submit comments, attend public meetings, attend Board meetings, submit comments to the Board, etc.

Q. How much heat are we talking about; can it heat the whole school?

A. About 30MW of heat and 1 MW of heat is enough for around 750 homes. It produces way more heat than needed to heat the school.

Q. What is the cost of refueling in 23 years?

A. The cost of refueling won't be the responsibility of CVEA, although it will be incorporated into the PPA.

Q. How do you transfer the heat to where it is needed?

A. Heat can be piped within a mile without losses.

Q. How will you ensure safety during transportation?

A. Transportation is very safe. It is highly regulated, crash tested, very sophisticated, and the fuel itself is far more rugged than anything in use today.

Q. Are there other plants tested and deployed?A. Yes, very similar. The technology has been in use. This plant would be a very scaled-down version of existing gas-cooled plants.

Q. Are there any in the US?

A. No, there are no plants in the US, but the fuel is being used in the US.

Q. Why wasn't tidal on the list of alternative generation resources studied?

A. We have looked at tidal. Tidal surges in Valdez were found to be too severe. They would destroy the equipment. Tidal was quickly eliminated as an opportunity for Valdez. However, we continue to keep tabs on the technology; as it improves, it may become a valid opportunity in the future. 5-6 years ago hydrokinetic tidal was basically abandoned in Alaska, but it has recently been re-energized. There is currently a small test project being deployed in Homer. There are also other small demo units in the US, 50 KW or smaller.

Q. Would the plant be remote or manned by Operators?

A. The plant would be manned, but is designed so it could be remotely operated.

Q. Who would pay for workforce training?

A. This would be an owner cost. There are also emergency protocols with training and funding available for local, state, and federal responders.

Q. Would USNC sell excess electricity to others?

A. No, not electricity under the current project plan. They would sell heat to others. USNC or the owner could also build out to provide more electricity if the Intertie went through.

Q. Why is USNC interested in owning a plant and selling power to CVEA?

A. It is a good business case for USNC.

Q. Would the price be stable over the long-term life of the project?A. It would be a set rate just like other projects. CVEA would negotiate a long-term stable rate that was in the best interest of CVEA members.

Q. Is there room to expand at the given site locations?

A. This has not been determined. A unit takes up roughly ¾ acre. We would need roughly ¾ acre to expand for every additional unit.

Q. Does CVEA take into account the adverse effects uranium mining has on the communities it affects when making these decisions? A. Yes. All of it is considered. It is important to remember, however, that no technology is free from adverse effects. Not this, and not the technology people support using today.

Q. Will this lower electric rates?

A. Yes. The goal is to lower electric rates in the winter. That was the entire reason for looking into this project.

Q. Will this project allow for future growth?

A. Yes. Expansion is possible. Additional modules further reduce rates.

Q. Has CVEA exhausted options for hydropower?

A. No. We continue to look at all options for incremental hydropower. We love hydropower, but building hydropower plants also come at a cost. We are currently discussing the potential of raising the dam at Solomon Gulch and continue to look at efficiencies when generating power at the hydroplants.

UNDERSTANDING THE ADVANCED NUCLEAR DIFFERENCE

BASICS OF A SAFE FUEL SYSTEM

RESOURCES FOR ADDITIONAL INFORMATION

Office of NUCLEAR ENERGY www.energy.gov/ne/office-nuclear-energy

SUGGESTED SEARCH TERMS

Advanced Reactors, Micro Reactors, Small Nuclear Power Reactors, Radioactive Wastes (myths and realities)

world-nuclear.org

TRADITIONAL U.S. NUCLEAR PLANTS

REDUNDANT SAFETY

A typical U.S. nuclear power plant produces 1,000 megawatts and uses a pressurized water design to produce heat and steam with no greenhouse gas emissions. Redundant systems with decades of operating experience ensure the plants safely control the fission chain reaction, prevent overheating, loss of coolant, loss of power and other conditions that could result in damage to the core or the fuel.

Layered Safety Approach

Today's plants use a layered approach to safety that includes the plant design, safety systems, operating procedures, and redundant backup systems to ensure the safe and reliable production of nearly 52% of our nation's clean energy and 19% of our total electricity each year.

TYPICAL NUCLEAR FUEL

Most of the fuel in use today is uranium dioxide encased in zirconium alloy cladding to contain radiation and harmful fission products. Because the fuel must be constantly water cooled, extreme consequences can result if the flow is impeded or stopped by loss of power or damage to circulating pumps.

Cladding

Water as coolant and moderato

TRADITIONAL WATER-BASED MODERATOR Most reactors use water as a moderator to control the rate of

fission by slowing down the neutrons that pass between fuel pellets inside the reactor. This makes the reaction more efficient and predictable in operating the plant.

COOLANT

The water also serves as the coolant to remove heat from the core and is used to produce steam that drive the turbines that produce electricity.

COOLING SYSTEM

The plant uses a series of coolant pumps to circulate the heated water through a system of pressurizers and steam generators (or heat exchangers) to maintain the core temperature and produce steam. Replacement water is added to ensure consistent coolant levels.

LARGE

Higher pressures and higher energy fuel cores rely on big pressurizers and steam generators to contain and manage steam for electricity.

COMPLEX

Elaborate and redundant electrical systems, pumps, and pipes all work in concert to keep the plant operating properly.

Fuel in a nuclear power plant does not burn like coal, natural gas or a log in a fireplace. The fission chain reaction in the uranium releases constant heat that is used to generate steam. The steam drives a turbine to create electricity.

HOW DOES NUCLEAR FUEL WORK?

INHERENT SAFETY

Today's advanced nuclear plants, including 1 to 50 megawatt micro reactors, are smaller and safer. The leading micro reactor designs are high-temperature gas-cooled reactors that use TRISO fuel, helium as a coolant and graphite as the moderator. These simpler designs are more fuel efficient and inherently safer.

TRISO FUEL

Advanced Triple-Coated Isotropic (TRISO) fuel encases a small amount of uranium within layered ceramic coatings that are further encased in an armor coating. Unlike traditional nuclear fuel, TRISO fuel generates stable heat by maintaining separation between each active core. Fission byproducts are contained within each TRISO particle and none contain enough uranium to require active cooling systems. The fuel cannot cause a meltdown or other severe consequences.

GRAPHITE MODERATOR

The reactor core consists of graphite blocks that contain the fuel pellets. The MMR reactor core has a low power density and a high heat capacity. This results in very slow and predictable temperature changes making the core all but impossible to damage.

Should power or cooling ever be lost, the core will cool itself without damage and with no operator action needed.

HELIUM COOLED

Helium, as the primary coolant, is chemically inert and cannot react with the fuel, the silicon carbide casings, or the graphite. Complications like corrosion and hydrogen production are eliminated.

SMALL

The MMR takes advantage of cost-effective factory production, strict quality controls, modular construction and low maintenance.

SIMPLE

The reactor is fueled once and sealed for its initial 20-year operating life. The core can be replaced to extend the operating life for another 20-year cycle. It is designed for simplicity and reliable safety.

ADVANCED MICRO REACTOR NUCLEAR PLANTS

A FIT FOR ALASKA

SMALL AND SCALABLE

- MMR system modules are designed to fit international shipping containers, simplifying logistics for remote site development.
- A single, 5MWe MMR provides ample baseload for many remote communities, resource development projects and other off-the-grid facilities.
- MMR's can be "linked" as needed to provide sufficient heat or power for the application.
- Affords opportunities for small-scale district heat as well as power generation.

MEETS COMMUNITY NEEDS:

- Provides up to 20 years of reliable, stable-priced, zero-carbon power for communities reliant on diesel generation.
- The MMR's load-following ability makes it an ideal baseload complement to variable renewable power sources.
- Solves the most common impediment to economic development in rural Alaska reliable energy.
- USNC is ready for open and transparent dialogue regarding all aspects of nuclear energy with Alaska stakeholders to answer as many questions and concerns as we can.

ZERO-CARBON ENERGY:

- A direct, emissions-free replacement for coal and diesel-fired power generation.
- Does not contribute to the public health issues caused by carbon-emitting fuels.
- No risk of fuel spill and soil or water contamination.
- Emissions-free power for industrial applications requiring air quality permits.

ANMALERE

ur vision is to provide reliable zero-carbon energy that is safer, simpler, and more versatile than today's technologies, on Earth and beyond. Founded in 2011, Ultra Safe Nuclear Corporation is a global leader and strong vertical integrator of nuclear technologies and services. We are committed to opening new markets around the world for safe, commercially competitive, clean, and reliable heat and power from nuclear energy.

AMERICAN MADE. **GLOBALLY ENGAGED.**

Ultra Safe Nuclear Corporation (USNC), is a 300+ person Seattlebased technology company that designs, licenses, manufactures, develops and operates clean energy technologies and products. We have offices across the United States, Canada, South Africa, Europe, Australia and South Korea focusing on reactor design, component fabrication, licensing, materials development, fuel production, and reactor manufacturing for nuclear technologies.

LIFECYCLE CONFIDENCE.

storage facility.

ULTRA SAFE NUCLEAR

USNC is the only privately funded advanced nuclear firm in the United States actively producing its own fuel at our Oak Ridge, Tenn. facility. Our vertical integration strategy provides reduces risk and cost and increases certainty during project development. Our Micro-Modular™ Reactor (MMR®) 'nuclear battery' is walk-away

safe, generating zero-carbon heat and power for residential and commercial users for up to 20 years. After that time, USNC will transport the spent fuel to a government-commissioned

MMR: A.K.A. **THE "NUCLEAR BATTERY**"

As the name implies, our Micro-Modular Reactor utilizes advanced nuclear technologies to to be utilized as a long-term nuclear battery - a reliable source of on-demand heat and power for countless applications.

SAFETY

At the heart of an innumerable list of safety elements designed into the MMR is our TRISO fully encapsulated fuel and a passive cooling system that requires no human intervention in the event of a shutdown.

SIZE

A single MMR unit produces up to 5 megawatts of continuous power and 3B Kilowatt hours of heat equivalent. The modules are sized for international shipping containers for ease of transport. MMR projects are also extremely scalable by adding additional reactor units.

NUCLEAR BATTERY

The MMR's size, inherent safety design and ability to provide zero-carbon energy that follows user demand for practical purposes makes it a long-term industrial-scale battery – except it doesn't need to be recharged.

LEADING DEPLOYMENT. **MEETING THE MARKET.**

USNC's Oak Ridge, Tenn., facility is the first privately funded advanced nuclear fuel factory in the United States. USNC also has two active deployments ongoing in the U.S. and Canada and is in the regulatory process for commercial licensing.

Project Name	Location	First Power	Application	# MMR Batteries
Chalk River	Canada	2026	Commercial demonstration project	1
University of Illinois	U.S.	2027	Research and training, including microgrid integration	1

APPLICABILITY

MMR Nuclear Batteries are small, safe, reliable high-temperature gas reactors (HTGR) producing zero-carbon heat behind the fence for industrial applications and drop-in combined heat and power generation.

INDUSTRIAL:

- Refining
- Chemicals
- Data centers
- Hydrogen production
- Fish processing
- USNC is committed to working with stakeholders to find additional applications for advanced nuclear power.

REMOTE:

District heat

r)	
0	1200
facture	
Hydrogen production	

Resource development (mining) Government and research facilities

Zero-carbon microgrid baseload

USNC'S MMR® TECHNOLOGY

USNC is an advanced energy company focused on the delivery of safe, commercially competitive, clean, and reliable nuclear energy to markets throughout the world. The Seattle-based company designs, licenses, manufactures, and develops clean energy technologies. USNC designed a microreactor specifically for remote applications that are difficult to support with conventional baseload or renewable power.

- Built for long refueling cycles that limit logistic challenges in fuel supply
- The capability to adapt the fuel cycle allows integration with seasonal hydroelectric to match electrical demand
- The capability to load follow allows the use of MMRs in microgrids, even with variable renewable energy sources
- Modular construction allows for agile and prompt on-site construction
- Modules can be easily added to increase capacity
- Can deliver high-quality, electrical-generating heat (steam)
- Waterless cooling
- Able to perform in extreme cold

"We want to prove to Alaskans that our technology can meet Alaska's unique energy needs by providing reliable and clean power to small populations dispersed across vast distances, despite harsh climate, geography, and other environmental conditions," said USNC CEO, Francesco Venneri.

ADVANCED FEATURES OF THE MMR

The USNC MMR will utilize proven reactor technologies, modern manufacturing and construction techniques, and a state-of-the-art fuel design to produce zero-carbon, heat and electricity safely, reliably and at a cost-effective rate. Although a specific site has not been chosen, the MMR is designed to be built offsite and transported for final assembly on a site roughly the size of a baseball field.

USNC FCM® (Fully Ceramic Microencapsulated) TRISO FUEL

FCM fuel is manufactured with industry-standard Triple Coated Isotropic (TRISO) fuel particles, whose primary purpose is to contain fission products. The TRISO fuel, which contains the radioactive byproducts of fission within layered ceramic coatings, is further encased within a fully dense silicon carbide matrix. This is like encasing the fuel in a diamond-like substance. The combination of TRISO fuel particles and the silicon carbide coating provides an extremely rugged and stable fuel with extraordinary high temperature stability.

FOR MORE INFORMATION CONTACT:

Mary Woollen, Director Stakeholder Engagement Ultra Safe Nuclear Corporation m.woollen@usnc.com • 307-413-8679 • usnc.com

Pilot Fuel Manufacturing Facility

Seattle-based Ultra Safe Nuclear Corporation (Ultra Safe Nuclear) owns and operates the Pilot Fuel Manufacturing (PFM) facility in Oak Ridge, Tennessee. The PFM is the first private sector manufacturing plant producing TRi-structural ISOtropic (TRISO) coated fuel particles and Ultra Safe Nuclear's proprietary Fully Ceramic-Microencapsulated (FCM®) fuel. The PFM features:

- A complete array of production-scale modules required for TRISO and FCM production
- A 3D-printing process licensed from Oak Ridge National Laboratory for manufacturing refractory ceramic carbides
- Licenses for processing pilot-scale quantities of both natural and enriched uranium needed for fuel production

The PFM is located in the East Tennessee Technology Park (ETTP), site of the Manhattan Project's K-25 gaseous diffusion plant. Ultra Safe Nuclear purchased the site and industrial building from Heritage Center, LLC in 2021 and was able to leverage the region's specialized workforce and industrial ecosystem to get the PFM up and running in less than a year.

Fuel Based Safety

Safety is provided at the fuel level rather than requiring complex and extensive safety systems like traditional reactors. USNC's proprietary FCM fuel provides inherent reactor safety by being an ultimately safe fuel. Industry standard TRISO fuel, which contains the radioactive byproducts of fission within layered ceramic coatings, are encased within a diamond-like silicon carbide matrix. The TRISO fuel particle is essentially a miniature container that retains radioactive material. FCM provides an unprecedented additional level of protection.

- Our fuel can withstand higher temperatures and more radiation than what it will be exposed to in the Micro Modular Reactor (MMR[®]) Energy System.
- The silicon carbide matrix in FCM fuel provides a dense, gas-tight barrier preventing the escape of fission products even if a TRISO particle should rupture.
- Silicon carbide allows FCM fuel to tolerate extreme radiation, high temperature, and corrosive environments without significant deterioration in performance and without affecting nuclear reactions.

FCM fuel is a major advancement in the development of safe nuclear fuel.

Investing in U.S. Advanced Nuclear

Privately funded, American-owned and controlled Ultra Safe Nuclear has been able to commission the PFM facility for TRISO and FCM fuel production in less than a year after it took possession of the building. USNC's growing presence in Oak Ridge will create more than 30 highly skilled jobs within the first two years of operation. The company's expansion in Oak Ridge highlights Ultra Safe Nuclear's commitment to rapid and efficient development of its advanced technologies and a focus on delivering tangible products to a U.S. energy market that needs nuclear power to shed carbon emissions.

Ultra Safe Nuclear's PFM facility vertically integrates and exercises the entire TRISO and FCM manufacturing process.

Local Expertise

Oak Ridge offers a highly skilled nuclear workforce and strong business climate that enabled the PFM facility to transform a legacy industrial site to an innovative and state-of-the-art manufacturing facility. Vital support contributing to this first-in-the-nation success included:

- Tennessee Department of Economic& Community Development
- Oak Ridge National Laboratory
- Y-12 National Security Complex
- Tennessee Valley Authority

Testing & Qualification

When produced, FCM fuel will go through a rigorous testing and qualification program to be certified for use in the U.S.

- Irradiation testing at the High Flux Reactor (HFR) in Petten, Netherlands (2023)
- Post irradiation examination to verify performance (2025-2026)
- FCM Fuel Qualification Topical Report requesting approval for use from the U.S. Nuclear Regulatory Commission (2026)
- Continued testing through 2030 to bound FCM fuel lifetime

Through advances in nuclear science and technology including FCM fuel, MMR Energy System, Nuclear Thermal Propulsion, and EMBERCORE™, Ultra Safe Nuclear is delivering reliable energy anywhere.