

Advanced Nuclear Directory

Developers, Suppliers and National Laboratories



GAIN

Gateway for Accelerated
Innovation in Nuclear

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INTRODUCTION

The Advanced Nuclear Directory offers a sample of companies engaged in the development of advanced nuclear technologies and should not be considered a comprehensive list of this industry. All companies featured have participated on a voluntary basis and are responsible for the information provided. Inclusion of a company does not indicate endorsement by any of the directory's sponsors.

ACKNOWLEDGMENT

The Advanced Nuclear Directory was created in partnership between GAIN, Third Way, and the United States Nuclear Infrastructure Council (USNIC).

*GAIN reserves the right to edit content for publishing purposes.

GATEWAY FOR ACCELERATED INNOVATION IN NUCLEAR



The mission of the GAIN initiative is to provide the nuclear energy industry with access to the technical, regulatory, and financial support necessary to move advanced nuclear technologies toward commercialization, while ensuring the continued reliable and economic operation of the existing nuclear reactor fleet. GAIN offers a single point of access to the broad range of capabilities across the Department of Energy (DOE) national laboratory complex. DOE has invested billions of dollars to build and maintain its nuclear research expertise and infrastructure. This vast capability is being leveraged via GAIN to support commercialization of new advanced nuclear technologies.



Location: Idaho Falls, ID

Founded: 2015

Director: Christine King

Federal Engagement: DOE-NE, NRC, NSUF, NEUP, LWRS, NEAMS, ART

Preferred Point of Contact: Christine King | christine.king@inl.gov | 650-283-4235

gain.inl.gov

FAST REACTORS INFO SHEET

INTRODUCTION

DOE-NE has established the Gateway for Accelerated Innovation in Nuclear (GAIN) to provide the nuclear community with access to the technical regulatory and financial support necessary to move innovative nuclear energy technologies toward commercialization while ensuring the continued safe reliable, and economic operation of the existing nuclear fleet.

Developing safe, reliable sources of carbon-free energy will be the next decade's greatest challenge for US power producers. Several US-based companies are developing Fast Reactors (FRs), a type of advanced nuclear reactor to help meet that energy challenge.

Without a moderator nuclear reactions occur at high energies, producing more efficient fission reactions. Developers of this reactor type offer increased safety, reduced proliferation risk, improved management of nuclear waste, and industrial applications, all at a lower cost than traditional reactors. In some designs the reactor can recycle waste from other reactors, or produce additional fuel.

Four types of FRs are being developed by US companies: the Sodium Cooled Fast Reactor (SFR), Lead-Cooled Fast Reactor (LFR), Gas-Cooled Fast Reactor (GFR), and Molten Salt Fast Reactors (MSFR).

Fast Reactors

COST EFFICIENCY

As utilities evolve to meet the challenges of a modernizing grid, advanced nuclear reactor technologies seek to provide economically viable solutions through simplified designs and reduced operational costs.

INTEGRATION & RELIABILITY

Flagging load growth and the rise of distributed generation sources are driving advanced nuclear developers to provide flexible, always on power to end users.

SAFETY & WASTE

The possibility of Fukushima-like events is eliminated by the inherent physics of the reactor through a failsafe design; fuel waste concerns are substantially reduced.

Designs are intended for factory assembly and fixed modular construction, assuring on-budget projects while reducing overall costs.

Some FRs have a long-lived core, making the need for refueling infrequent; in some concepts, a reactor can operate for 30-60 years before it needs refueling.

When compared with current reactor designs, passive safety features cut operational and maintenance costs.

Reactors can achieve higher temperatures than fossil fuels, producing a high-quality steam cycle to meet commercial, industrial, and residential needs.

Reactors are designed for a modern grid, capable of load following and integrating with variable renewable energy sources.

FRs have demonstrated the ability to consume existing spent nuclear fuel from current generation reactors; most designs allow for the recycling of used fuel, limiting or reducing waste.

Operation in the fast spectrum allows for more efficient fuel use than current generation reactors, reducing waste and fuel costs.

FRs have demonstrated inherent safety under severe accident conditions.

| | | Thermal Output (per unit) | Electrical Output (per unit) | Total Plant Footprint | Primary System Water Requirements | Industrial Heat & Steam | Load Following |
|--------------|---------------|---------------------------|------------------------------|-----------------------|-----------------------------------|-------------------------|----------------|
| < 10 MWe | Micro Systems | < 30 MWt | < 10 MWe | Fast Food Restaurant | None | ✓ | ✓ |
| 10 - 300 MWe | Small Systems | 30 - 1000 MWt | 10 - < 300 MWe | Parking Garage | None | ✓ | ✓ |
| > 700 MWe | Large Systems | > 1000 MWt | > 700 MWe | Industrial Factory | None | ✓ | ✓ |

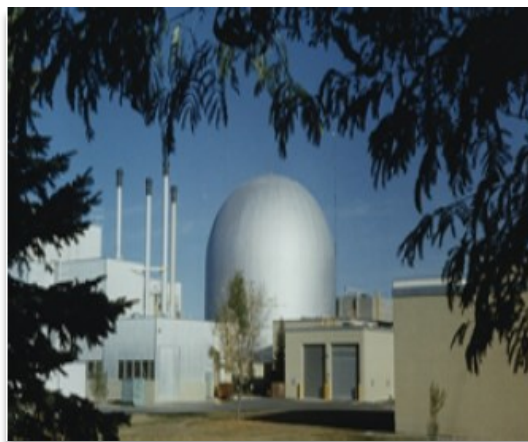
May 24, 2021

Inherently Safe by Design

By operating in the fast spectrum with a liquid metal coolant, FRs are able to provide both high power density and passively safe operation. FRs rely on "fast neutrons" to cause fission, and can be designed without a moderator (e.g., water) in the reactor core. A liquid metal coolant allows for efficient heat transfer at low pressure, promoting natural circulation and passive decay heat removal. In the event of a rise in temperature, the physics of the reactor provides reactivity feedback that inherently reduces the reactor's power. This inherent safety behavior prevents severe accidents, as demonstrated by Experimental Breeder Reactor-II (Image 1). FRs using gas and salts can achieve similar inherent safety performance by passively removing heat, and incorporating self-stabilizing reactivity feedbacks.

Fuel Cycle Features

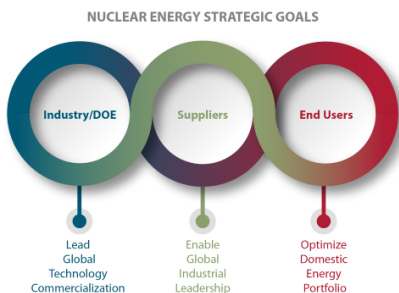
The unique properties of FRs enable efficient fuel utilization and waste minimization. FRs can operate with a favorable neutron balance; fission reactions in FRs are capable of creating more neutrons than consumed. By converting these excess neutrons into usable fuel materials, some FRs are designed to produce more fuel. FRs are also flexible to accept a wide range of fuel materials, with many designs capable of recycling existing nuclear waste in a closed fuel cycle. The efficient fuel utilization of FRs can also enable some designs to operate for decades without refueling. FRs offer fuel cycle flexibility, providing a robust fuel supply and improved nuclear waste management.



Experimental Breeder Reactor-II (EBR II) at the National Reactor Testing Station in Idaho

Load Following and Integration

By deploying FRs in an energy mix, power producers are able to provide reliable electricity to customers while integrating with other generation technologies, such as variable renewable energy resources. Flexible load following capabilities allow a reactor to adjust to demand and intermittent supply. In times when less power is needed, fast reactors have a ramp-down rate of less than 15 minutes. When the demand for energy increases, it can be ramped up to full power within minutes.



Additional Fast Reactor Resources:

bit.ly/IAEA-FastReactor-Reference

bit.ly/GAIN-FastReactor

bit.ly/ANL-EBR2-History

HIGH TEMPERATURE REACTORS INFO SHEET

INTRODUCTION

DOE-NE has established the Gateway for Accelerated Innovation in Nuclear (GAIN) to provide the nuclear community with access to the technical, regulatory, and financial support necessary to move innovative nuclear energy technologies toward commercialization while ensuring the continued safe, reliable, and economic operation of the existing nuclear fleet.

Developing safe, reliable sources of carbon-free energy will be the next decade's greatest challenge for US power producers. Several US-based companies are developing High Temperature Reactors (HTRs), a type of advanced nuclear reactor, to help meet that energy challenge.

HTRs are a type of graphite-moderated thermal reactor employing TRISO fuels (see below), differentiating them from other advanced reactor concepts. HTRs use either inert gas or molten salt as a heat transfer medium. Developers of this reactor type offer increased safety, remote power, and industrial applications.

HTRs typically use low enriched uranium fuel to produce higher reactor outlet temperatures than other reactors. For this reason, developers of HTRs offer it as a viable replacement to industrial fossil fuel processes.

High Temperature Reactors

COST EFFICIENCY

As utilities evolve to meet the challenges of a modernizing grid, advanced nuclear reactor technologies seek to provide economically viable solutions through simplified designs and reduced operational costs.

INTEGRATION & RELIABILITY

Flagging load growth and the rise of distributed generation sources are driving advanced nuclear developers to provide flexible, always on power to end users.

SAFETY & WASTE

The possibility of Fukushima-like events is eliminated by the inherent physics of the reactor through a failsafe design; fuel waste concerns are substantially reduced.

Designs are intended for factory assembly and fixed modular construction, assuring on-budget projects while reducing overall costs.

Many designs support online refueling, avoiding disruption in customers' energy demands.

When compared with current reactor designs, passive safety features cut operational and maintenance costs.

Reactors can achieve higher temperatures than fossil fuels, producing a high-quality steam cycle to meet commercial, industrial, and residential needs.

Reactors are designed for a modern grid, capable of load following and integrating with variable renewable energy sources.

HTR designs either utilize non-reactive helium gas or molten salts as a heat transfer medium, providing an added measure of safety.

More efficient fuel usage than current generation reactors reduces waste and fuel costs for operators.

Ceramic TRISO fuel, coupled with a large graphite and salt heat capacity, allows for a slow fuel temperature response in the event of cooling loss.

| | | Thermal Output (per unit) | Electrical Output (per unit) | Total Plant Footprint | Primary System Water Requirements | Industrial Heat & Steam | Load Following |
|--------------|---------------|---------------------------|------------------------------|-----------------------|-----------------------------------|-------------------------|----------------|
| < 10 MWe | Micro Systems | < 30 MWt | < 10 MWe | Fast Food Restaurant | None | | |
| 10 - 300 MWe | Small Systems | 30 - 1000 MWt | 10 - < 300 MWe | Parking Garage | None | | |
| > 700 MWe | Large Systems | > 1000 MWt | > 700 MWe | Industrial Factory | None | | |

May 24, 2021

Quality Process Heat for Industrial Applications

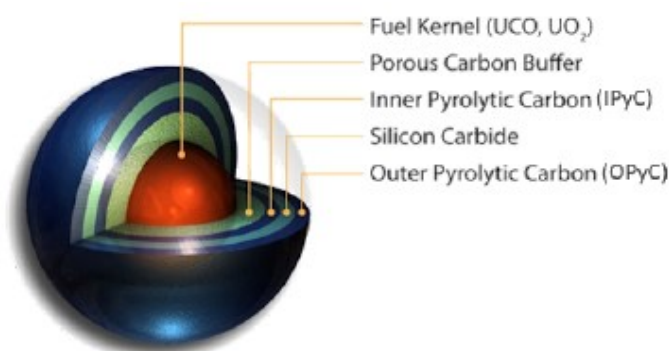
All HTR systems have the ability to reach higher and more precise temperatures than those that use fossil fuels. HTRs' ability to consistently produce clean, quality heat is especially important in industrial chemical processes, where a plant must maintain a set range of temperatures for successful production. HTRs, therefore, can reduce the margin of error for operators, resulting in greater cost efficiencies.

Inherent Safety that Starts at the Fuel Source

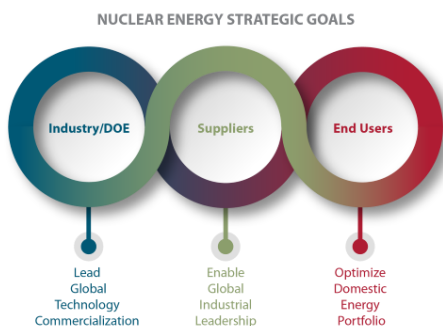
HTRs are built around safety, beginning with advances in nuclear fuel technology. All HTRs use “tri-structural isotropic” fuels, commonly referred to as TRISO fuels (Image 1). TRISO fuel comes in different shapes and sizes; no matter the form, this advanced fuel source contains a small amount of low-enriched uranium fuel within three layers of protective graphite and silicon carbide. These TRISO particles are incorporated into a graphite matrix within spheres (“pebbles”) the size of a golf ball or a tennis ball, or into blocks (“compacts”). The coatings around the TRISO particles fully contain fission products resulting from the nuclear reaction, eliminating the need for costly, concrete containment structures.

Load Following and Integration

By deploying HTRs in an energy mix, power producers are able to provide reliable electricity to customers while integrating with other generation technologies, such as variable renewable energy resources. Flexible, load following capabilities of HTRs enable integration with intermittent renewable energy sources; moreover, the high-grade heat produced by HTRs make thermal energy storage or integration with industrial processes possible and attractive during low electricity demand intervals.



A tri-structural isotropic or “TRISO” fuel particle



Additional High Temperature Reactor Resources:

bit.ly/INL-ART-GCR

bit.ly/NRC-Training-Course-HTR

bit.ly/IAEA-ARIS-Database

MOLTEN SALT REACTORS INFO SHEET

INTRODUCTION

DOE-NE has established the Gateway for Accelerated Innovation in Nuclear (GAIN) to provide the nuclear community with access to the technical, regulatory, and financial support necessary to move innovative nuclear energy technologies toward commercialization while ensuring the continued safe, reliable, and economic operation of the existing nuclear fleet.

Developing safe, reliable sources of carbon-free energy will be the next decade's greatest challenge for power producers in the US. Several US-based companies are developing Molten Salt Reactors (MSRs), a type of advanced nuclear reactor, to help meet that energy challenge.

MSRs utilize low pressure, high temperature fluoride or chloride salts as liquid fuels and coolants. MSRs are different from most other advanced reactor concepts because of their ability to operate in a low pressure environment, as well as at higher temperatures and for longer durations than other reactor types. Developers of this reactor offer increased safety, reduced proliferation risk, passive safety system features, and short-lived waste.

MSRs could play a significant role in closing the nuclear fuel cycle, increasing fuel utilization, and reducing long-lived waste products.

Molten Salt Reactors

COST EFFICIENCY

As utilities evolve to meet the challenges of a modernizing grid, advanced nuclear reactor technologies seek to provide economically viable solutions through simplified designs and reduced operational costs.

INTEGRATION & RELIABILITY

Flagging load growth and the rise of distributed generation sources are driving advanced nuclear developers to provide flexible, always on power to end users.

SAFETY & WASTE

The possibility of Fukushima-like events is eliminated by the inherent physics of the reactor through a failsafe design; fuel waste concerns are substantially reduced.

Some designs are intended for factory assembly and fixed modular construction, assuring on-budget projects while reducing overall costs.

Able to operate at full power while being refueled, avoiding a disruption in customers' energy demands.

When compared with current reactor designs, passive safety features cut capital, operations, and maintenance costs.

Reactors can achieve higher temperatures, producing electricity more efficiently or high-quality heat for industrial processes.

MSRs are designed for a modern grid, capable of load following and integrating with variable renewable energy sources.

Flexible designs allow for the use of various fuel types; some designs are capable of consuming used fuel from other reactors.

Fuel compositions are flexible compared to current generation reactors, allowing for various fuel cycle approaches to increase resource utilization and reduce waste.

Passive safety features can allow for "walk away" safety, even during severe events.

| | | Thermal Output (per unit) | Electrical Output (per unit) | Total Plant Footprint | Primary System Water Requirements | Industrial Heat & Steam | Load Following |
|--------------|---------------|---------------------------|------------------------------|-----------------------|-----------------------------------|-------------------------|----------------|
| < 10 MWe | Micro Systems | < 30 MWt | < 10 MWe | Fast Food Restaurant | None | ✓ | ✓ |
| 10 - 300 MWe | Small Systems | 30 - 1000 MWt | 10 - < 300 MWe | Parking Garage | None | ✓ | ✓ |
| > 700 MWe | Large Systems | > 1000 MWt | > 700 MWe | Industrial Factory | None | ✓ | ✓ |

May 24, 2021

Readily Apparent Safety

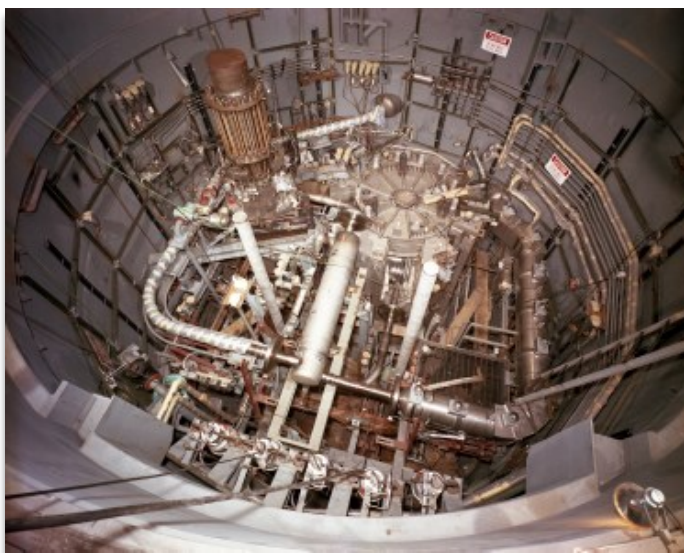
Due to the inherent characteristics of low pressure, chemically-inert coolants and liquid fuel systems, MSR are easily coupled to passive safety systems that eliminate the need for many of the safety systems needed for other reactor types. MSR can be designed to be “walk away” safe and operate with low pressure components and systems, which improve the economic performance and enhance the safety of the reactor.

High-Quality Energy

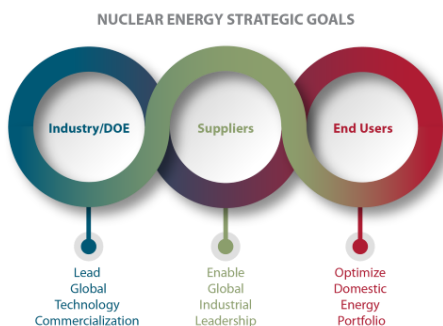
MSR produce high temperature heat for efficient electricity production and for application in high temperature industrial applications, including the production of hydrogen. MSR are attractive because of their potential to operate at higher, more efficient temperatures for extended operational cycles.

Load Following and Integration

By employing MSR in an energy mix, a power producer is able to provide reliable energy to its customers while integrating with variable resources. Flexible load following capabilities of MSR enable integration with intermittent renewable energy sources; moreover, the high-grade heat produced by MSR make thermal energy storage or integration with industrial processes possible and attractive during low electricity demand intervals.



A TOP VIEW OF THE Molten Salt Reactor Experiment (MSRE) at Oak Ridge National Laboratory



Additional Molten Salt Reactor Resources:

bit.ly/GAIN-MSR

bit.ly/YouTube-MSR

bit.ly/ORNLM-MSR

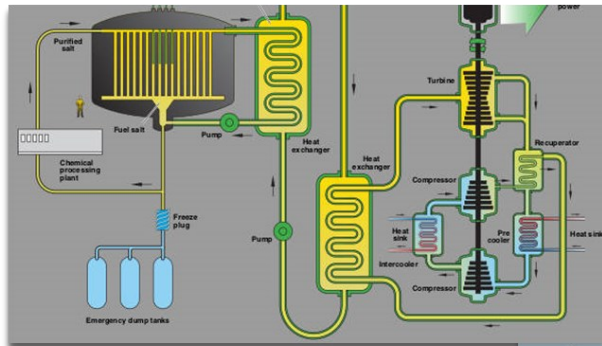
bit.ly/FluidFuelReactors

DEVELOPERS

ALPHA TECH RESEARCH CORP



Alpha Tech Research Corp is developing thorium fueled Molten Salt Reactor (MSR) technology to enable a new phase in clean, safe power production.



ADVANCED NUCLEAR | DEVELOPER

Location: Salt Lake City, UT

Founded: 2016

Principal/CEO: Nick Baguley

Major Investors: Non-disclosed

Technology Class: MSR

Reactor Type: MSTIR

Power Output (MWe/MWT): 30MWT

Federal Engagement: DOE, NRC

Preferred Point of Contact: Staci Wheeler | staci@alphatechresearchcorp.com | 801-477-0715

<https://alphatechresearchcorp.com/>

ARC CLEAN TECHNOLOGY, INC.



ARC is a clean energy technology company developing the ARC-100, an advanced small modular reactor (aSMR) offering inherently safe, reliable, and economical carbon free power. Leveraging proven technology from the 30-year performance of its prototype, the ARC-100's simple, modular design provides 100 megawatts of electricity and industrial heat that is cost competitive with fossil fuels. Important applications include the decarbonization of heavy industry, the fueling of low-carbon hydrogen projects, and the creation of valuable medical isotopes. The ARC-100 is the recipient of an ARDP (ARC-20) award from the U.S. DOE. It has also been selected by New Brunswick Power for implementation on their Point Lepreau site, with completion targeted for the late 2020s. ARC has offices in Washington, DC, and Saint John, New Brunswick.

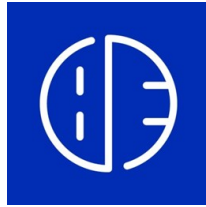


Location: Washington, DC
Founded: 2006
Principal/CEO: Donald Wolf
Major Investors: Non-disclosed
Technology Class: Advanced small modular reactor
Reactor Type: Sodium cooled fast reactor
Power Output (MWe/MWt): 100 MWe / 286 MWt
Federal Engagement: DOE, NRC
Preferred Point of Contact: Irfan Ali | iali@arc-cleantech.com

<https://arc-cleantech.com/>

ADVANCED NUCLEAR | DEVELOPER

BRILLOUIN ENERGY CORP.



ADVANCED NUCLEAR | DEVELOPER

Brillouin Energy Corp. is a clean-technology company located in Berkeley California, which is developing ultra-clean, low-cost, energy technology capable of producing industrially useful thermal energy. Brillouin's technology is based on Low Energy Nuclear Reactions (LENR), which it generates on a controlled basis in its reactors through Controlled Electron Capture Reaction (CECR) concept. Third party verified by SRI in 2016, 2017 and 2018. Some of the basic physics of CECR, verified in a TAP with PNNL Feb-2013. Extremely scalable technology designed to drop into shell and tube heat exchangers where the tube is a new type of fire and DTC friendly. No radioactive waste, no penetrating radiation in operation. Four test systems already work with interchangeable parts.



Location: Berkeley, CA

Founded: 2009

Principal/CEO: Robert W. George

Major Investors: 46 Angel Investors

Technology Class: Adaptable gas, liquid, supercritical CO₂ Water / steam 80 -700C

Reactor Type: CECR, low energy nuclear reactions

Power Output (MWe/MWt): 10⁻⁶ - 3000+ MWe / 10⁻⁵ - 8000 MWt

Federal Engagement: NA

Preferred Point of Contact: David Firshein | dnf@brillouinenergy.com | 415-419-6429

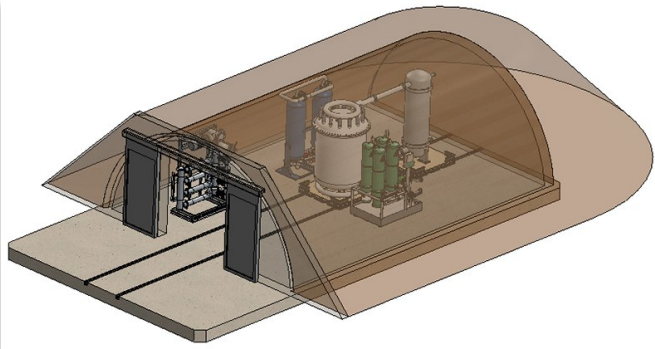
<https://brillouinenergy.com/>

BWX TECHNOLOGIES, INC.



ADVANCED NUCLEAR | DEVELOPER

BWX Technologies, Inc. (BWXT) provides safe and effective nuclear solutions for national security, clean energy, environmental remediation, nuclear medicine and space exploration. With approximately 6,700 employees, BWXT has 12 major operating sites in the U.S. and Canada. We are the sole manufacturer of naval nuclear reactors for U.S. submarines and aircraft carriers. Our company supplies precision manufactured components, services and fuel for the commercial nuclear power industry across four continents. Our joint ventures provide environmental remediation and nuclear operations management at more than a dozen U.S. Department of Energy and NASA



facilities. BWXT's technology is also driving advances in medical radioisotope production in North America and microreactors for various defense and space applications.

Through its entities, BWXT is developing BANR (BWXT Advanced Nuclear Reactor). BANR is a transportable microreactor designed to utilize advanced TRISO particle fuel to achieve higher uranium loading and improved fuel utilization.

Location: Lynchburg, VA

Founded: 1857

Principal/CEO: Rex D. Geveden

Major Investors: BWX Technologies, Inc. is publicly traded on the New York Stock Exchange

Technology Class: High Temperature Gas Reactor

Reactor Type: High Temperature Gas Microreactor

Power Output (MWe/MWT): 17 MWe / 50 MWT

Federal Engagement: DOE, NRC,

Preferred Point of Contact: Joshua L. Parker | jl Parker2@bwxt.com | 434-316-7652

[https:// www.bwxt.com/](https://www.bwxt.com/)

COLUMBIA BASIN CONSULTING GROUP

ADVANCED NUCLEAR | DEVELOPER



CBCG is a business management and technical consulting firm which provides services relating to advanced reactor engineering and development.



CBCG PbBi Nuclear Plant Development - Power When You *Need* it to BE-THERE

Location: Kennewick, WA

Founded: 1998

Principal/CEO: William J. Stokes

Major Investors: Self-funded

Technology Class: Liquid metal cooled

Reactor Type: Lead-bismuth and sodium

Power Output (MWe/MWt): 260 MWe / 600 MWt; 100 MWe / 250 MWt

Federal Engagement: DOE, GAIN, Other

Preferred Point of Contact: William J. Stokes | wjstokes@cbcglc.com | aporter@cbcglc.com

<http://www.cbcglc.com/>

EXODYS ENERGY, INC.



EXODYS ENERGY believes that nuclear energy innovation will propel humanity past energy poverty and pollution. With over 400,000 tons of nuclear fuel waste, the world has centuries of clean energy security. To unlock this potential, the company is developing two technologies:

- UP-CYCLE: Nuclear waste-to-fuel conversion process
- KLOOROS: Advanced Molten Salt Modular Reactor

The concepts are based on the product of a diverse team of U.S. Navy advanced reactor designers and leaders in both civil and military (naval & space) nuclear power programs. UPCYCLE & KLOOROS are being engineered to quickly scale up nuclear energy by improving safety & security margins, with the lowest environmental footprint.

ADVANCED NUCLEAR | DEVELOPER

Location: New York, NY

Founded: 2022

Principal/CEO: Carl Perez

Major Investors: Non-Disclosed

Technology Class: Advanced Modular Reactor

Reactor Type: Molten Salt Reactor: Fast-spectrum, Chloride Salt

Power Output (MWe/MWt): 500-3000 MWt / 200-1200 MWe

Federal Engagement: DOE, GAIN

Preferred Point of Contact: Carl Perez | cperez@exodysenergy.com | 646-706-3698

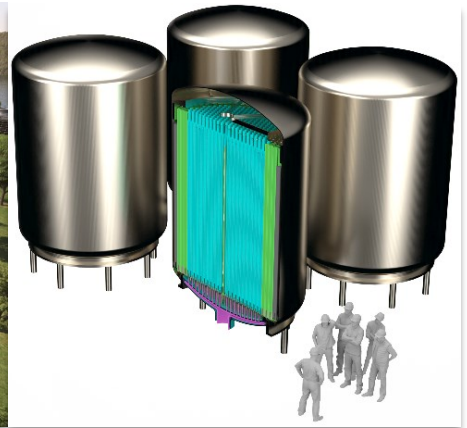
<https://www.exodysenergy.com/>

FLIBE ENERGY, INC.



ADVANCED NUCLEAR | DEVELOPER

Founded in 2011 in Huntsville, Alabama, Flibe Energy, Inc. (FEI) was the world's first molten-salt reactor company. FEI is developing the Lithium Fluoride Thorium Reactor (LFTR) and associated technologies, building on the Molten Salt Reactor Program that operated at Oak Ridge National Laboratory from 1957-1976. Through use of on-site chemical processing, LFTR consumes all of its thorium fuel, keeps long-lived isotopes out of the waste stream, and only requires management of a small quantity of short-lived waste in low-cost near-surface regional repositories. Furthermore, utilization of a supercritical CO₂ power conversion system reduces turbomachinery size and complexity, enables tritium capture, and makes dry cooling possible. LFTR has a low-risk supply chain due to a lack of mining, enrichment, solid fuel fabrication, long-lived waste, as well as through use of domestic suppliers for major materials and components. With growing populations and increasing electrification, LFTR provides a path to sustainable energy.



Location: Huntsville, AL and Richland, WA

Founded: 2011

Principal/CEO: Kirk Sorensen

Major Investors: Private

Technology Class: Molten salt reactor

Reactor Type: Liquid fuel/coolant, fluoride salts, thermal spectrum, graphite moderator, thorium/U-233 fuel cycle

Power Output (MWe/MWt): 250 MWe / 600 MWt

Federal Engagement: DOE, GAIN, NRC

Preferred Point of Contact: Kurt Harris | kurt.harris@flibe-energy.com

<https://flibe-energy.com/>

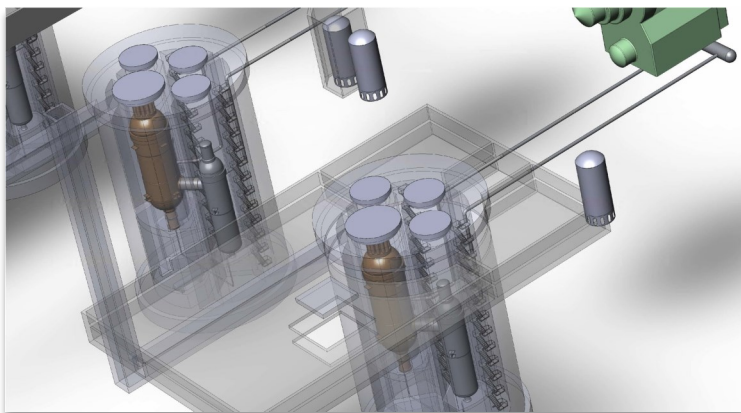
FRAMATOME, INC.



ADVANCED NUCLEAR | DEVELOPER

Framatome is a major international player in the nuclear energy market recognized for its innovative solutions and value-added technologies for designing, building, maintaining, and advancing the global nuclear fleet. The company designs, manufactures, and installs components, fuel and instrumentation and control systems for nuclear power plants and offers a full range of reactor services.

Framatome is developing the Steam Cycle HTGR Generation IV advanced reactor concept. Its scalable design provides options for a variety of customer needs for high-temperature steam and electricity. Its unparalleled safety profile allows co-location with customer facilities.



True walk-away safety and restart capability following a design-basis accident make the SC-HTGR a low investment risk for plant owners and operators.

Location: Lynchburg, VA

Founded: 1989

Principal/CEO: Gary Mignogna

Major Investors: Non-disclosed

Technology Class: High temperature gas cooled

Reactor Type: Steam cycle high temperature gas cooled reactor

Power Output (MWe/MWT): 22-272 MWe / 50-625 MWT

Federal Engagement: DOE, GAIN, ARPA-E, NRC

Preferred Point of Contact: Darryl Gordon | Darryl.gordon@framatome.com | 434-832-5199

www.framatome.com

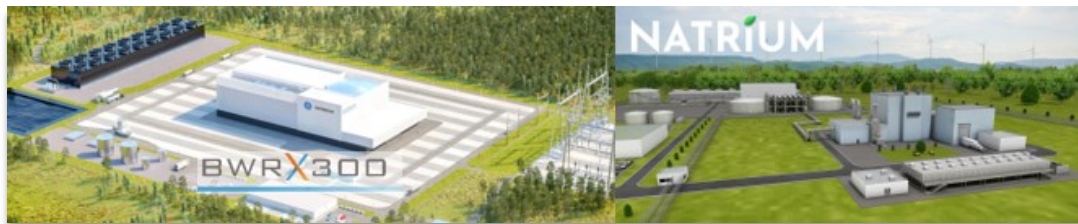
GE HITACHI NUCLEAR ENERGY

ADVANCED NUCLEAR | DEVELOPER



HITACHI

BWRX-300 Small Modular Reactor (SMR) - GE Hitachi Nuclear Energy (GEH) is a world leader in new plant technology, fuel and services. GEH's BWRX-300 is a 300 MWe water-cooled, natural circulation small modular reactor with passive safety systems that leverages the design and licensing basis of the company's U.S. NRC-certified ESBWR. Through dramatic and innovative design simplification, GEH projects the BWRX-300 will require significantly less capital cost per MW when compared to other SMR designs. By leveraging the ESBWR design certification, utilizing the licensed and proven GNF2 fuel design, and incorporating proven components and supply chain expertise the BWRX-300 can, GEH believes, become the lowest-risk, most cost-competitive and quickest to market SMR.



Natrium Integrated Energy System - GEH is working with TerraPower to develop the Natrium™ technology, a sodium fast reactor with integrated energy storage (IES). Together the team reinvented what nuclear can be: flexible and cost competitive. Natrium's architecture has been specifically designed to lower operational costs, simplify construction and reduce schedule compared to previous reactor types. On a per MWe basis, it uses 80% less nuclear-grade concrete compared to today's large reactors. Its energy storage system can provide customizable GWhe scale energy storage to capture greater revenue thereby eliminating the economic penalty for load following while supporting grids with high renewables penetration.

Versatile Test Reactor - GEH and TerraPower are on the team led by Bechtel National Inc. to support the design and build phase of the Versatile Test Reactor, a one-of-a-kind facility that would support research and development of innovative, clean nuclear energy technologies.

Location: Wilmington, NC

Founded: 1955

Principal/CEO: Jay Wileman

Major Investors: Confidential

Technology Class: BWRX-300 - GEN III+ SMR; Natrium - GEN IV Advanced Reactor

Reactor Type: BWRX-300 - Boiling water reactor; Natrium - Sodium fast reactor

Power Output (MWe/MWt): BWRX-300 - 300 MWe / 910 MWt; Natrium - 345 MWe /840 MWt (The IES system can boost output to 500MWe for more than 5 1/2 hours to serve peak demand)

Federal Engagement: DOE, NRC

Preferred Point of Contact: Bob Dunn | robert.dunn@ge.com

<https://.nuclear.gepower.com/>

GENERAL ATOMICS ELECTROMAGNETIC SYSTEMS



ADVANCED NUCLEAR | DEVELOPER

General Atomics Electromagnetic Systems (GA-EMS) Group has been at the forefront of innovation in nuclear energy since the 1950s. We continue to push the boundaries of what is possible in advanced nuclear reactors while helping to sustain our current reactor fleet and spinning off advanced material technologies that have the potential to enhance public safety and well-being. GA's TRIGA® research reactors are some of the most successful reactor designs in history.

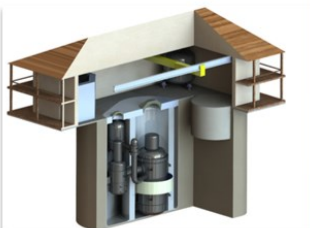
GA-EMS is building on its experience with TRIGA® in developing the next generation of advanced fission reactors, such as the 50 MWe Fast Modular Reactor (FMR) for distributed power generation in the mid-2030s to be followed by the 265 MWe 4-unit (1 GWe) Energy Multiplier Module (EM2) for grid-scale power generation. These two load-following advanced high temperature helium-cooled fast reactors have a net efficiency as high as 53%. Both reactors employ cutting-edge advances in materials science to address the four core challenges facing nuclear energy – safety, waste, cost, and non-proliferation. EM2 and

FMR can be powered by fresh or spent nuclear fuel and operated without refueling for up to 30 for EM2 and 9 years for the FMR.

GA is developing silicon carbide composites, SiGA®, for Accident Tolerant Fuel cladding and reactor components, such as those in the EM2 and FMR. Innovative technology solutions are underway for specialty nuclear fuels, radioactive waste remediation, advanced materials for extreme environment applications, space reactors for both propulsion and power.



The FMR Power Plant Layout



The FMR Reactor System



Two EM² modules on seismically isolated platform

Location: San Diego, CA

Founded: 1955

Principal/CEO: Neal Blue

Major Investors: Non-disclosed

Technology Class: Advanced nuclear reactors, fuels and materials

Reactor Type: High temperature gas cooled fast reactors

Power Output (MWe/MWt): 50MWe / 112 MWt (FMR); 4 x 265 MWE / 4 x 500 MWt (EM2)

Federal Engagement: DOE, GAIN, NRC, DARPA, DoD, NASA, Other

Preferred Point of Contact: Ron Faibish | ron.faibish@ga.com | 202-713-8333

<https://www.ga.com/ems>

GENERAL FUSION

generalfusion®

ADVANCED NUCLEAR | DEVELOPER

General Fusion is the world's most advanced private fusion technology venture, pursuing a faster and more practical path to commercially viable fusion energy.



Location: Burnaby, Canada

Founded: 2002

Principal/CEO: Christofer Mowry

Major Investors: Government of Canada Strategic Innovation Fund, Bezos Expeditions, Khazanah Nasional, Chrysalix Energy VC, Braemar Energy Ventures, SET Ventures, Cenovus Energy, BDC Canada, GrowthWorks, Entrepreneurs Fund, Sustainable Development Technology Canada

Technology Class: Fusion

Reactor Type: Magnetized target fusion

Power Output (MWe/MWT): 200 MWe

Federal Engagement: Other

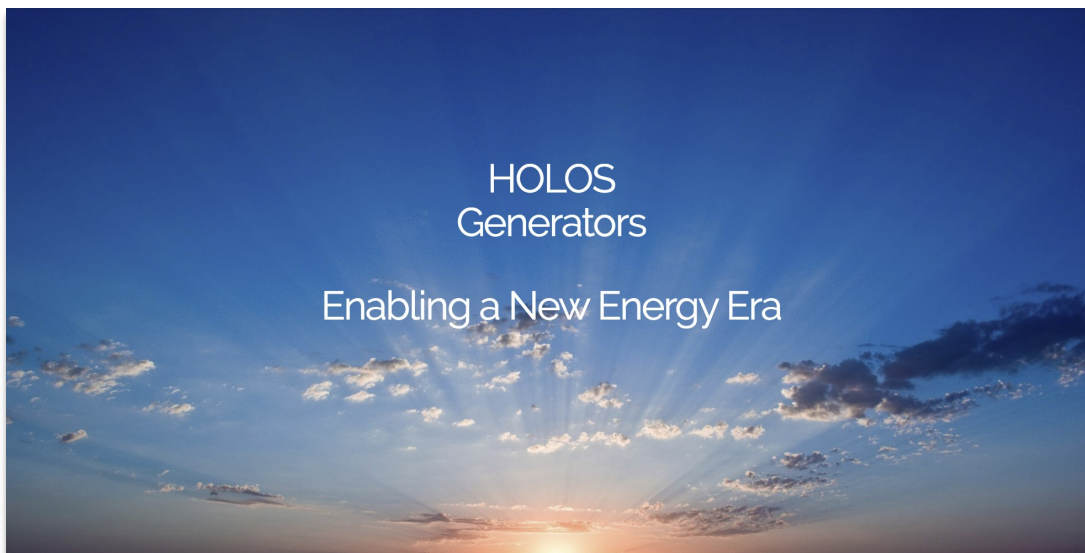
Preferred Point of Contact: Grace Sullivan | grace.sullivan@generalfusion.com

<https://generalfusion.com/>

HOLOGEN LLC

HolosGen™

HolosGen develops mobile scalable integral nuclear generators with simplified and innovative designs that are optimized to produce economical, distributable, pollutant-free, and most importantly, safe electricity.



ADVANCED NUCLEAR | DEVELOPER

Location: Manassas Park, VA

Founded: 2017

Principal/CEO: Claudio Filippone

Major Investors: Non-disclosed

Technology Class: Gas cooled

Reactor Type: High temperature gas reactor

Power Output (MWe/MWt): 3-81 MWe / 5-135 MWt

Federal Engagement: N/A

Preferred Point of Contact: Claudio Filippone | <http://www.holosgen.com/contact-us/>

<http://www.holosgen.com/>

HOLTEC INTERNATIONAL



ADVANCED NUCLEAR | DEVELOPER

Holtec's SMR-160 is a robust small modular reactor that delivers 160 MW net electric in a small footprint. SMR-160 is based on pressurized water reactor technology and uses low enriched uranium fuel to provide reliable, affordable and carbon-free energy. The SMR-160 is "walk-away safe," requiring no operator actions during natural disasters, man-made threats, or any of the conditions required to be considered by U.S. regulations. It is the ideal solution for sustaining economic growth worldwide. Since SMR-160 can integrate readily to both established electrical grids or as an independent distributed power source, it is well adapted for both undeveloped and developed countries. SMR160 is truly modular. The majority of the plant's equipment and structures are factory-fabricated and can be delivered to each site in segments. An SMR-160-based site can easily be expanded with additional units to meet current and future demand. Please visit www.smrllc.com for more information.



Location: Camden, NJ <https://holtecinternational.com/products-and-services/smr/>

Founded: 1986

Principal/CEO: Dr. Krishna P. Singh

Major Investors: Non-disclosed

Technology Class: Advanced Small Modular Reactor

Reactor Type: Light Water PWR

Power Output (MWe/MWT): 160 MWe

Federal Engagement: DOE, NRC

Preferred Point of Contact: Myron Kaczmarzsky | m.kaczmarzsky@holtec.com | 856-797-0900 x 3657

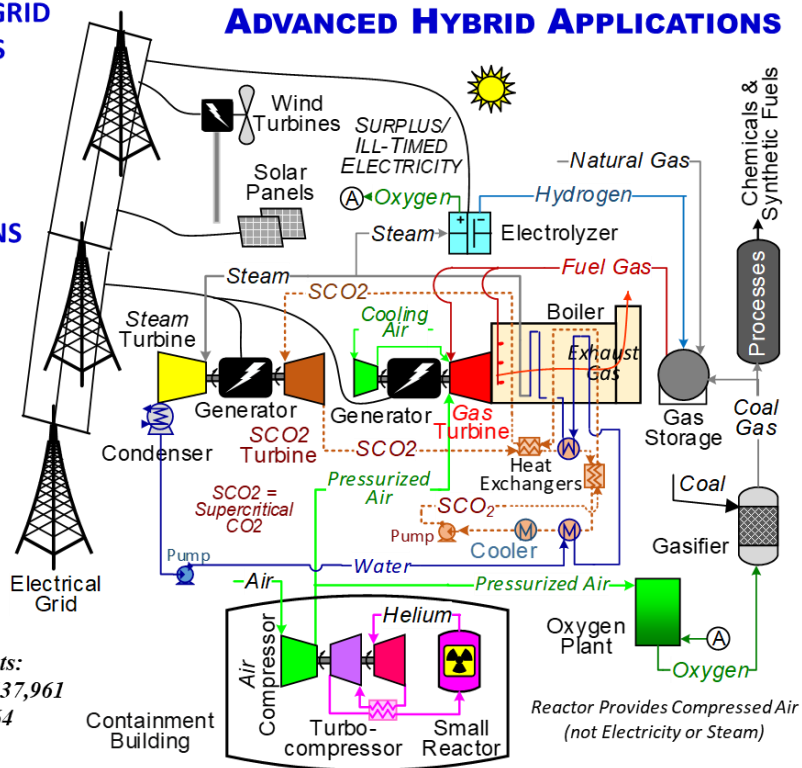
HYBRID POWER TECHNOLOGIES LLC



- READILY SUPPORTS GRID
- USES ALL RESOURCES
 - ✓ Nuclear
 - ✓ Natural Gas
 - ✓ Coal
 - ✓ Solar & Wind
- MASSIVE REDUCTIONS
 - ✓ Nuclear Fuel
 - New
 - Spent
 - ✓ Fossil Fuels
 - ✓ CO2 Emissions
- NUMEROUS USES
 - ✓ Power
 - ✓ Chemicals
 - ✓ Synthetic Fuels
 - ✓ Co-Generation



U.S. Patents:
7,961,835, 8,537,961
11,492,964



ADVANCED NUCLEAR | DEVELOPER

Location: Overland Park, KS

Founded: 2011

Principal/CEO: Michael F. Keller

Major Investors: Privately funded

Technology Class: Gas cooled

Reactor Type: Graphite moderated, helium cooled

Power Output (MWe/MWt): +1100 MWe/+630 MWt (Reactor)

Federal Engagement: N/A

Preferred Point of Contact: Michael F. Keller | m.keller@hybridpwr.com | 913-375-6983 (cell)

<https://www.hybridpwr.com/>

KAIROS POWER LLC



Kairos Power

ADVANCED NUCLEAR | DEVELOPER

Kairos Power is a mission-driven company singularly focused on its effort to commercialize the fluoride salt-cooled high-temperature reactor (FHR) in time to play a significant role in the fight against climate change. Kairos Power is disrupting the industry with rapid iterative development and vertical integration strategies to deliver a clean energy solution with robust safety at an affordable cost.



Location: Alameda, CA

Founded: 2016

Principal/CEO: Michael Laufer

Major Investors: Non-disclosed

Technology Class: Solid-fueled/Molten salt cooled

Reactor Type: Graphite-moderated, fluoride salt-cooled, high temperature reactor

Power Output (MWe/MWT): N/A

Federal Engagement: GAIN

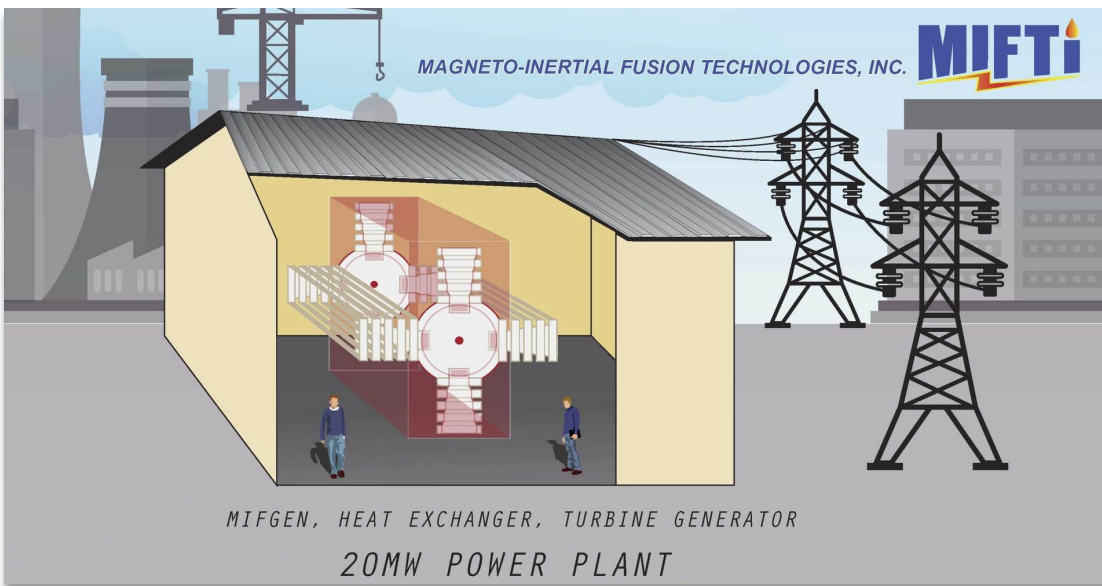
Preferred Point of Contact: info@kairospower.com | 510-508-5265

<https://kairospower.com>

MAGNETO-INERTIAL FUSION TECHNOLOGIES, INC.



MIFTI specializes in fusion energy and medical isotope technology.



ADVANCED NUCLEAR | DEVELOPER

Location: Tustin, CA

Founded: 2009

Principal/CEO: Jerry Simmons, CEO / Dr. Hafiz Rahman, President, Chief Scientist

Major Investors: DOE, ARPA-E, Strong Atomics Fund 1, U.S. Nuclear Corp. (UCLE)

Technology Class: Thermonuclear fusion/Staged Z-Pinch

Reactor Type: Nuclear fusion reactor

Power Output (MWe/MWT): 20 MWe

Federal Engagement: DOE, ARPA-E, INFUSE, LLNL, ORNL, University of Rochester, UNR/NTF, UCSD

Preferred Point of Contact: Jerry Simmons | jerry@miftec.com | 714-329-3990

<https://miftec.com/>

MICRONUCLEAR LLC



MicroNuclear LLC is focused on developing energy solutions. Current efforts include development of the Molten Salt Nuclear Battery (MsNB) as well as instrumentation and components for severe environment applications.



ADVANCED NUCLEAR | DEVELOPER

Location: Brentwood, TN

Founded: 2017

Principal/CEO: Paul Marotta

Major Investors: Proprietary private investors

Technology Class: Advanced Microreactor

Reactor Type: Molten Salt Dissolved Fuel

Power Output (MWe/MWT): 5-10MWe / 10-20MWT

Federal Engagement: DOE, GAIN, NRC

Preferred Point of Contact: Paul Marotta | paul@micronucleartech.com | 615-417-3649

<https://micronucleartech.com/>

MUONS, INC.

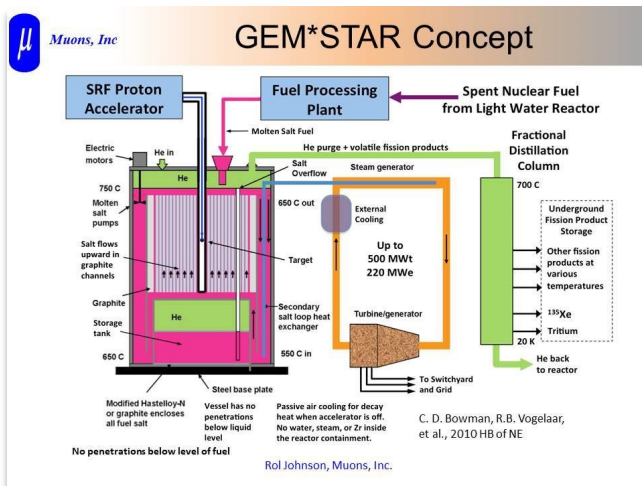


Muons, Inc.
Innovation in Research

ADVANCED NUCLEAR | DEVELOPER

Partnering with national labs and universities with their extraordinary people and facilities, Muons has leveraged its creative talents to provide solutions to many problems of global and national interest. Muons has received over \$30M in competitive DOE contracts and Small Business Innovation and Technology Transfer Research grants, which have generated intellectual property as well as appreciation for our work in the accelerator and reactor communities. Examples of our inventions are included in discovery science (Muon Collider, the next atom smasher); medicine (Energy-Recovery Linacs for commercial production of new radioisotopes for therapy and diagnostics); national security (photon and neutron sources for cargo scanning); energy

and environment (Mu*STAR subcritical system for carbon-free energy production); and industry (magnetron power sources for RF cavities). As a supporter of science and technology, Muons supports students and post-docs and provides computer programs for accelerator and reactor communities.



Location: Batavia, IL

Founded: 2002

Principal/CEO: Rolland Johnson, President

Major Investors: Rolland Johnson

Technology Class: Advanced reactor developer

Reactor Type: SRF linac driven subcritical molten salt thermal spectrum SMR

Power Output (MWe/MWt): 220 MWe/500 MWt

Federal Engagement: DOE, ARPA-E, GAIN, DOE SBIR-STTR Programs

Preferred Point of Contact: Rolland Johnson | rol@muonsinc.com | 757-870-6943

<https://muonsinc.com/>

NANO NUCLEAR ENERGY INC.

ADVANCED NUCLEAR | DEVELOPER



Nano Nuclear Energy Inc. is a nuclear reactor company focusing on developing deployable mobile reactors, capable of servicing remote industrial and manufacturing projects, previously uneconomic mining sites, oil, and gas projects, military bases, remote towns, islands, and disaster affected areas quickly requiring power. Nano has already engaged with several major institutional lenders and secured investment commitments. The Nano managerial and Executive team brings extensive capital and public markets experience to the Company, and intends to deploy that experience to Nano's benefit through IPOs and capital market raises. Nano strongly supports of the DOS and IAEA's objectives for the peaceful use of nuclear energy, and we intend our technology to form part of the U.S. foreign policy to advance the peaceful use of nuclear energy, science, and technology, and drive new resources to projects and activities in developing countries with the greatest need. Nano will seek to become a nuclear technology organization that can grow U.S. global energy market engagement and support global market opportunities.



Location: New York, NY

Founded: 2018

Principal/CEO: James Walker

Major Investors: UPS

Technology Class: Solid Core

Reactor Type: Microreactor

Power Output (MWe/MWt): 1MWe / 2.5 MWt

Federal Engagement: DOE, ARPA-E, GAIN

Preferred Point of Contact: James Walker, CEO | info@nanonuclearenergy.com

<https://nanonuclearenergy.com/>

NIOWAVE, INC.



ADVANCED NUCLEAR | DEVELOPER

Niowave is utilizing transformative science and technology for advancing nuclear power to meet the nation's energy and security needs. Niowave's Radioisotope Program established both the facilities and the NRC license to operate a subcritical assembly and perform nuclear fuel reprocessing. The team is developing a hybrid fast/thermal spectrum subcritical testbed, coupled to a superconducting electron linac, to provide peak fast-spectrum neutron fluxes greater than $1E15$ n/cm²s in heavy liquid-metal environment. The facility will be used to test novel fuels, materials, instruments and components, reactor safety designs, provide data for reactor code development, and support the regulatory process for licensing novel technology.



Location: Lansing, MI

Founded: 2005

Principal/CEO: Terry L. Grimm, President

Major Investors: Privately funded

Technology Class: Liquid metal cooled (lead-bismuth eutectic)

Reactor Type: Hybrid fast/thermal spectrum subcritical testbed

Power Output (MWe/MWT): 0.1-10 MWt

Federal Engagement: DOE, NRC, DoD, NIH

Preferred Point of Contact: Robert Wahlen | wahlen@niowaveinc.com | 517-999-3475

<https://www.niowaveinc.com/>

NUGEN, LLC



NuGen is developing a revolutionary direct-cycle microreactor for terrestrial, maritime and space uses. Due to its robust compact configuration and its versatility, it is called the NuGen Engine™. Its unique innovative design includes a patented spiral fuel core, with a streamlined energy conversion mechanism, in a fully integrated direct-cycle system contained in a single module. This means a simpler and more compact efficient system, with higher manufacturability and transportability and less maintenance. It would be deployable in a broad range of sectors and offer off-grid electricity, high-quality process heat and cogeneration. Uses include at remote locations, mining sites, desalination plants, domestic military installations and data banks, and for mini- and macro-grids, shipping, and space power and propulsion. The US Patent Office has issued NuGen six patents, with other patents pending. For a listing of the issued patents, see <https://www.nucdev.com/about-us.html>.



<https://www.nucdev.com/>

Location: Charlotte, NC

Founded: 2006

Principal/CEO: Steve Rhyne

Major Investors: Founder

Technology Class: Advanced HTGR

Reactor Type: Fast spectrum

Power Output (MWe/MWT): 1-3 MWe

Federal Engagement: DOE, GAIN, NRC

Preferred Point of Contact: Steve Rhyne | steve@nucdev.com | 704-307-7280

NUSCALE POWER



ADVANCED NUCLEAR | DEVELOPER

NuScale Power has developed a new modular light water reactor nuclear power plant to supply energy for electrical generation, district heating, desalination, and other process heat applications. This groundbreaking small modular reactor (SMR) design features a fully factory-fabricated NuScale Power Module™ capable of generating 77 MW of electricity using a safer, smaller, and scalable version of pressurized water reactor technology. NuScale's scalable design—power plants that can house up to four, six, or 12 individual power modules—offers the benefits of carbon-free energy and reduces the financial commitments associated with gigawatt-sized nuclear facilities. The majority investor in NuScale is Fluor Corporation, a global engineering, procurement, and construction company with a 60-year history in commercial nuclear power.

NuScale is headquartered in Portland, OR and has offices in Corvallis, OR; Rockville, MD; Charlotte, NC; Richland, WA; and London, UK. Follow us on Twitter: [@NuScale Power](#), Facebook: [NuScale Power, LLC](#), LinkedIn: [NuScale-Power](#), and Instagram: [nuscale_power](#). Visit NuScale Power's [website](#).



Location: Portland, OR

Founded: 2007

Principal/CEO: John Hopkins

Major Investors: Fluor Corporation

Technology Class: Water cooled

Reactor Type: Integral pressurized water reactor

Power Output (MWe/MWT): 50 MWe

Federal Engagement: DOE, NRC

Preferred Point of Contact: Ryan Dean, Sr. Public Affairs Specialist | rdean@nuscalepower.com

<https://www.nuscalepower.com/>

RADIANT



RADIANT

Radiant is making nuclear power portable. Radiant's mission is to develop an economical, reliable reactor that will transform the nuclear industry through autonomous operation. Portable microreactors can be used for disaster relief scenarios, resilient backup power, or as a microgrid power source. Our design uses only proven, qualified materials and technology and will achieve full scale demonstration in 5 years.



Location: El Segundo, CA

Founded: 2019

Principal/CEO: Douglas Bernauer

Major Investors: Boost VC

Technology Class: micro-HTGR

Reactor Type: HTGR

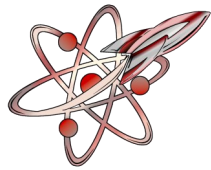
Power Output (MWe/MWt): 1.2 MWe /3.5 MWt

Federal Engagement: DOE, ARPA-E, GAIN, NRC, NASA

Preferred Point of Contact: Douglas Bernauer | doug@radiantnuclear.com | 216-965-3509

<https://www.radiantnuclear.com/>

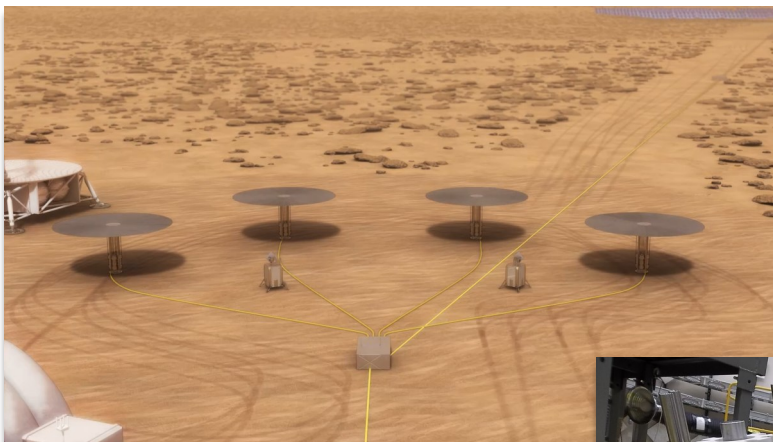
SPACE NUCLEAR POWER CORPORATION



SPACENUKES

ADVANCED NUCLEAR | DEVELOPER

Design and production of reactors for space applications including planetary surfaces and deep space NEP. Designs are based on work done by founders while at Los Alamos National Lab on KiloPower and KRUSTY experiment, a 1 kWe HEU reactor built and tested at Nevada Test Site in 2018.



KiloPower on Mars (Courtesy of NASA)



KRUSTY (Courtesy of LANL and NCERC)

Location: Los Alamos, NM

Founded: 2018

Principal/CEO: Andrew Phelps

Major Investors: Founders

Technology Class: Space Reactors

Reactor Type: Metal, fast reactor with sodium heat pipes to power conversion

Power Output (MWe/MWT): 1 KWe to 1 MWe

Federal Engagement: NASA, USAF, US Space Force

Preferred Point of Contact: Patrick McClure, COO | mcclure@spacenukes.com

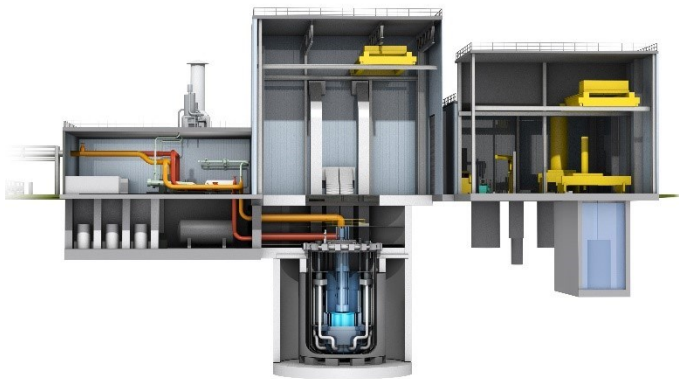
<https://www.spacenukes.com/>

TERRAPOWER, LLC

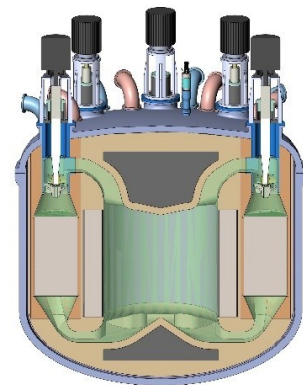


ADVANCED NUCLEAR | DEVELOPER

TerraPower is a nuclear innovation company that originated with Bill Gates and a group of like-minded visionaries who evaluated the fundamental challenges to raising living standards around the world. TerraPower's mission is to solve the world's toughest problems in energy, climate and human health through innovative nuclear technology. The Natrium™ reactor and integrated energy storage system is redefining what nuclear energy can be and is being demonstrated at a retiring coal facility. The Molten Chloride Fast Reactor technology is expanding the ability of nuclear technology to decarbonize industry beyond electricity, and TerraPower Isotopes develops processes to extract radioisotopes as raw materials for use by cancer drug developers.



Natrium™ Reactor



Molten Chloride Fast Reactor

Location: Bellevue, WA

Founded: 2008

Principal/CEO: Bill Gates (Chairman), Chris Levesque (President and CEO)

Major Investors: Non-disclosed

Technology Class: Liquid metal and salt cooled

Reactor Type: Natrium™ reactor—sodium-cooled fast reactor; Molten chloride fast reactor—molten salt/liquid fuel fast reactor

Power Output (MWe/MWT): Natrium reactor—345 MWe for demonstration project, flexible sizing up to gigawatt scale; Molten chloride fast reactor—flexible size range up to 800 MWe

Federal Engagement: DOE, NRC

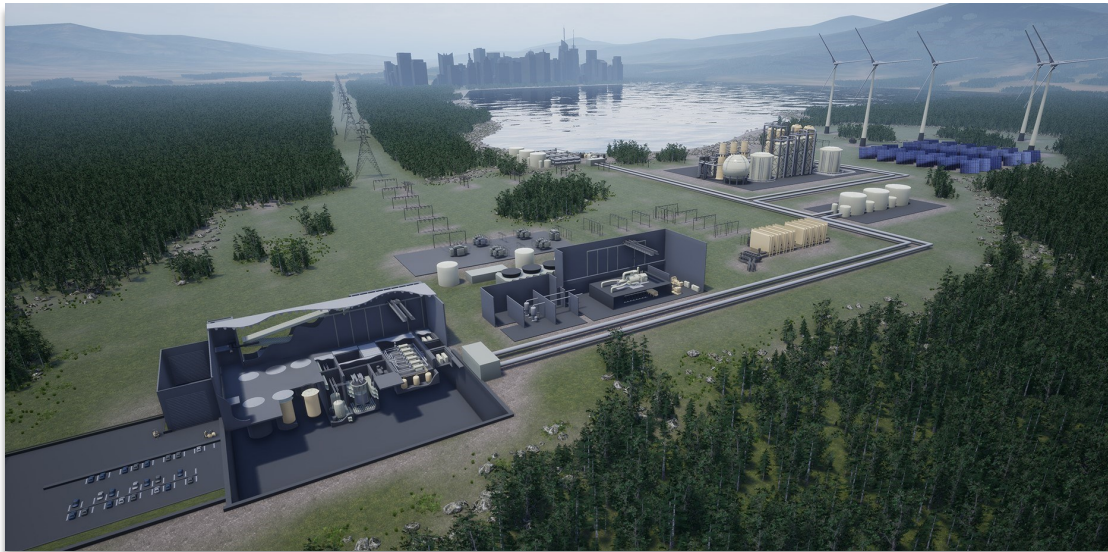
Preferred Point of Contact: press@terrapower.com

<https://www.terrapower.com/>

TERRESTRIAL ENERGY USA, INC.

TERRESTRIAL ENERGY USA

Terrestrial Energy USA is developing an advanced Small Modular Reactor (aSMR) design using Integral Molten Salt Reactor (IMSR®) technology to provide cost-competitive electricity and process heat to U.S. industry, and plans for first commercial deployment in the 2020s. The IMSR® design is a graphite moderated, LEU once-through fueled, fluoride molten salt reactor (MSR) that uses a replaceable reactor core architecture.



ADVANCED NUCLEAR | DEVELOPER

Location: Charlotte, NC

Founded: 2014

Principal/CEO: Simon Irish

Major Investors: Private investors

Technology Class: Advanced small modular reactor

Reactor Type: Molten salt reactor

Power Output (MWe/MWt): 390 MWe / 884 MWth

Federal Engagement: DOE, GAIN, NRC

Preferred Point of Contact: Robin Rickman | rickman@terrestrialusa.com | 646-687-8212 ext. 531

[HTTPS://terrestrialusa.com/](https://terrestrialusa.com/)

THORCON INTERNATIONAL

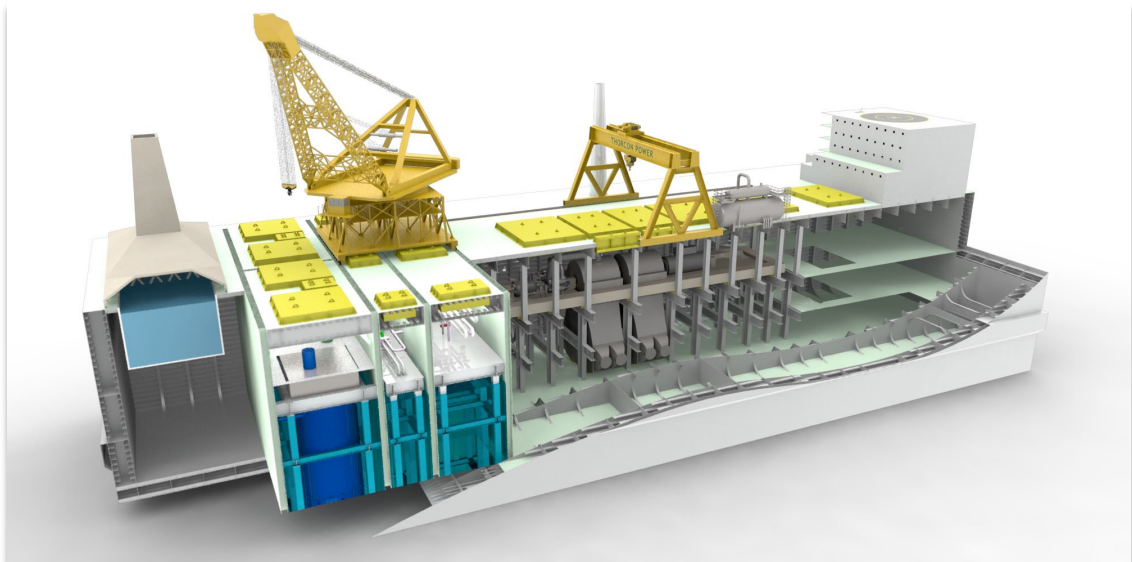
ADVANCED NUCLEAR | DEVELOPER

THORCON



POWERING UP OUR WORLD

ThorCon is developing a hybrid thorium/uranium liquid fission power plant that generates clean, full-time electric power at a cost cheaper than coal.



Location: Stevenson, WA; Singapore

Founded: 2016

Principal/CEO: Lars Jorgensen, CEO

Major Investors: Non-disclosed

Technology Class: Salt cooled

Reactor Type: Thermal molten salt reactor

Power Output (MWe/MWt): 250 MWe / 557 MWt

Federal Engagement: N/A

Preferred Point of Contact: info@thorconpower.com

<https://thorconpower.com/>

ULTRA SAFE NUCLEAR CORPORATION



ADVANCED NUCLEAR | DEVELOPER

Ultra Safe Nuclear is a 100+ employee technology company, well balanced between design, licensing, manufacture and project development, with a mix of young and senior engineers, material scientists and businesspeople, and a well-established network of suppliers and high-quality partnerships. We have a “best in business” workforce that is highly motivated, well tested and demonstrably capable of meeting tough development and commercial milestones. We are able to recruit competitively in all areas of operations in multiple countries.

USNC's mission provide hardware and services for reliable energy anywhere – on Earth and in Space. Developed since 2015, MMR is now becoming reality – the first in a family of hardware and service products for reliable energy anywhere. We are further utilizing our design, licensing, and technology capabilities, such as ceramic additive manufacturing and proprietary sintering techniques, to develop nuclear power systems for advanced applications on earth and in space. These include Transportable Power Units, Nuclear Thermal Propulsion and Lunar Surface Power systems.

Ultra Safe Nuclear operates through three divisions – POWER, CORE, and TECH.



Ready to Build.

USNC Power is developing commercial-grade, zero-carbon, zero-risk Energy Systems for power and heat utilization - on or off-grid.

Safety Matters.

USNC Core develops materials and fuels designed and manufactured at scale.

No Limits.

USNC Tech develops advanced systems and technology targeting space applications for commercial and government customers.

Location: Seattle, WA

Founded: 2011

Principal/CEO: Francesco Venneri

Major Investors: Non-disclosed

Technology Class: High temperature gas reactor

Reactor Type: Gas cooled high temperature reactor with FCM fuel pellets in graphite blocks

Power Output (MWe/MWTh): 5 MWe / 15 MWTh

Federal Engagement: DOE, ARPA-E, GAIN, NRC

Preferred Point of Contact: Cristian Rabiti | c.rabiti@usnc.com | 208-680-4518 (USNC)

Brandon Seifert | b.seifert@usnc-tech.com | 612-723-1664 (USNC-Tech)

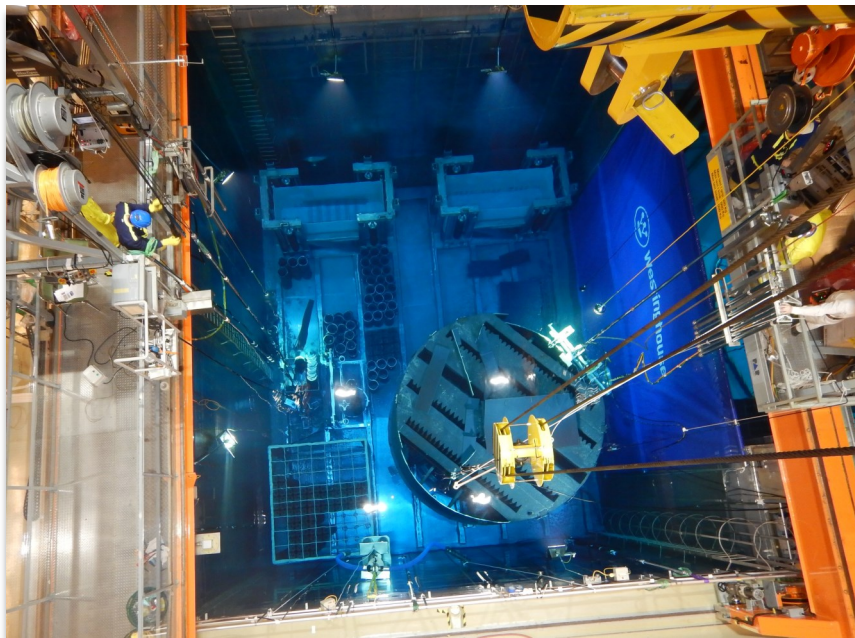
<https://usnc.com/>

WESTINGHOUSE ELECTRIC COMPANY LLC

ADVANCED NUCLEAR | DEVELOPER



Westinghouse Electric Company is the world's pioneering nuclear energy company and is a leading supplier of nuclear plant products and technologies to utilities throughout the world. Westinghouse supplied the world's first commercial pressurized water reactor in 1957 in Shippingport, PA, United States. Today, Westinghouse technology is the basis for approximately one-half of the world's operating nuclear plants. For more information, please visit www.westinghousenuclear.com.



Location: Cranberry Township, PA

Founded: 1886

Principal/CEO: Patrick Fragman, President and CEO

Major Investors: Brookfield Business Partners L.P.

Technology Class: Advanced modular reactor

Reactor Type: Lead cooled fast reactor; heat pipe cooled reactor

Power Output (MWe/MWt): Lead cooled fast reactor- 400-500 MWe / 950 MWt; Heat pipe cooled reactor- 0.5-6 MWe / 2-20 MWt

Federal Engagement: DOE, ARPA-E, GAIN, NRC

Preferred Point of Contact: Michael Valore | valorema@westinghouse.com

<https://www.westinghousenuclear.com/>

X-ENERGY, LLC



X-energy is a nuclear reactor and fuel design engineering services company developing Generation IV, high-temperature gas-cooled nuclear reactor designs that are smaller, simpler and meltdown-proof when compared to conventional nuclear designs.



ADVANCED NUCLEAR | DEVELOPER

Location: Greenbelt, MD

Founded: 2009

Principal/CEO: Sam Ghaffarian

Major Investors: Non-disclosed

Technology Class: Gas cooled

Reactor Type: High temperature gas cooled pebble bed reactor

Power Output (MWe/MWt): 76 MWe / 200 MWt

Federal Engagement: DOE, GAIN, ARPA-E, NRC

Preferred Point of Contact: Jeff Harper | jharper@x-energy.com

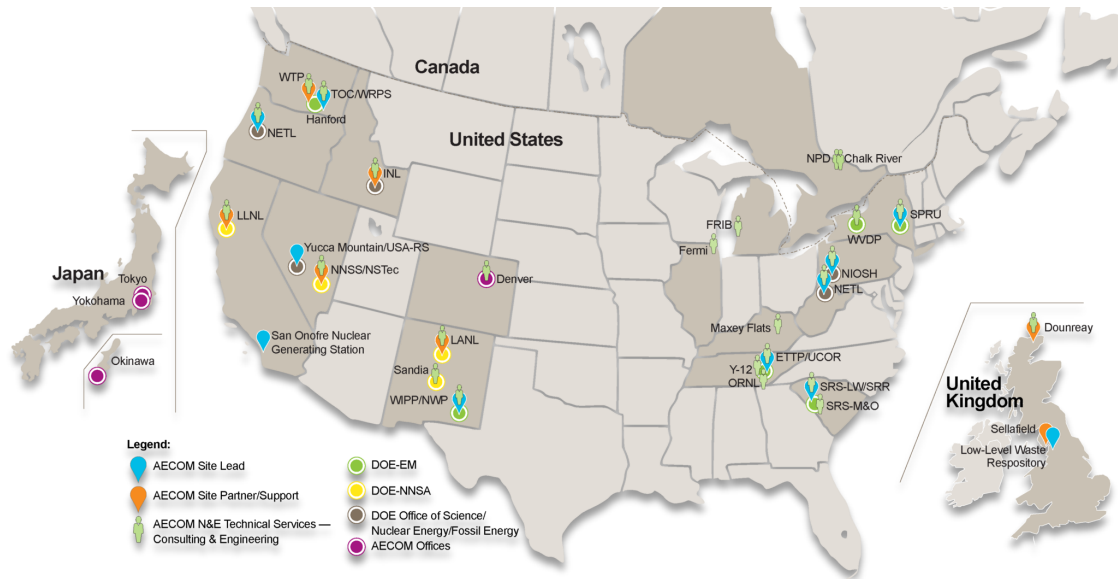
<https://www.x-energy.com/>

SUPPLIERS

AECOM

AECOM

AECOM is a global network of experts working with clients, communities and colleagues to develop and implement innovative solutions to the world's most complex challenges, from delivering clean water and energy to helping governments maintain stability and security. AECOM connects expertise across services, markets, and geographies to deliver transformative outcomes.



Location: Aiken, SC

Founded: 1990

Principal/CEO: Mike Burke

Major Customers: Non-disclosed

Federal Engagement: DOE, Other

Preferred Point of Contact: Eric Knox | eric.knox@aecom.com

<https://aecom.com/>

ANALYSIS AND MEASUREMENT SERVICES CORPORATION



INNOVATING **NUCLEAR** TECHNOLOGY

ANALYSIS AND MEASUREMENT SERVICES CORPORATION

AMS has decades of I&C testing experience within the operating fleet of light water reactors. As experts in I&C technologies, AMS offers next-generation reactor developers key insight and support in a variety of areas including I&C design specification support, pre-qualification testing of I&C sensors and cabling, development of I&C maintenance strategies and implementation procedures, implementation of online monitoring technologies, and a variety of other maintenance and diagnostic testing services.



ADVANCED NUCLEAR | SUPPLIER

Location: Knoxville, TN

Founded: 1977

Principal/CEO: H.M. Hashemian

Major Customers: Nuclear Power Plants and Facilities

Federal Engagement: DOE, NRIC, GAIN

Preferred Point of Contact: Adam Deatherage / adam@ams-corp.com / 865-691-1756 ext.223

<https://www.ams-corp.com/>

ANSYS



ADVANCED NUCLEAR | SUPPLIER

When visionary companies need to know how their world-changing ideas will perform, they close the gap between design and reality with Ansys simulation. For more than 50 years, Ansys software has enabled innovators across industries to push boundaries by using the predictive power of simulation. From sustainable transportation to advanced semiconductors, from satellite systems to life-saving medical devices, the next great leaps in human advancement will be powered by Ansys.



Founded in the Pittsburgh region and now headquartered in Canonsburg, PA, Ansys is dedicated to advancing simulation. Our nearly 6,000 employees are singularly focused, our spirit of innovation is reflected in 580+ active patents, and we are proud members of S&P and NASDAQ-100.

Nuclear reactors house extreme environments that are among the most difficult in the world for operating sensors. Yet these are exactly the environments where you need exquisite sensing capabilities - for detailed system monitoring, control, and predictive maintenance - to prevent catastrophe. Simulation is an essential part of the solution to this problem.

Physics-based simulation tools from Ansys are used in the nuclear industry to build, calibrate, validate, and deploy hybrid digital twins that provide real-time insights about a reactor through the power of virtual sensors. This is just one example of how digital twin technology is becoming increasingly important to nuclear power safety, by filling gaps in data and insight related to de-risking nuclear reactor design, licensing, and construction.

Location: Global

Founded: 1970

Principal/CEO: Ajei Gopal

Major Customers: Non-disclosed

Federal Engagement: Non-Disclosed

Preferred Point of Contact: Mike Hancock | mike.hancock@ansys.com | 512-422-3093

<https://www.ansys.com/>

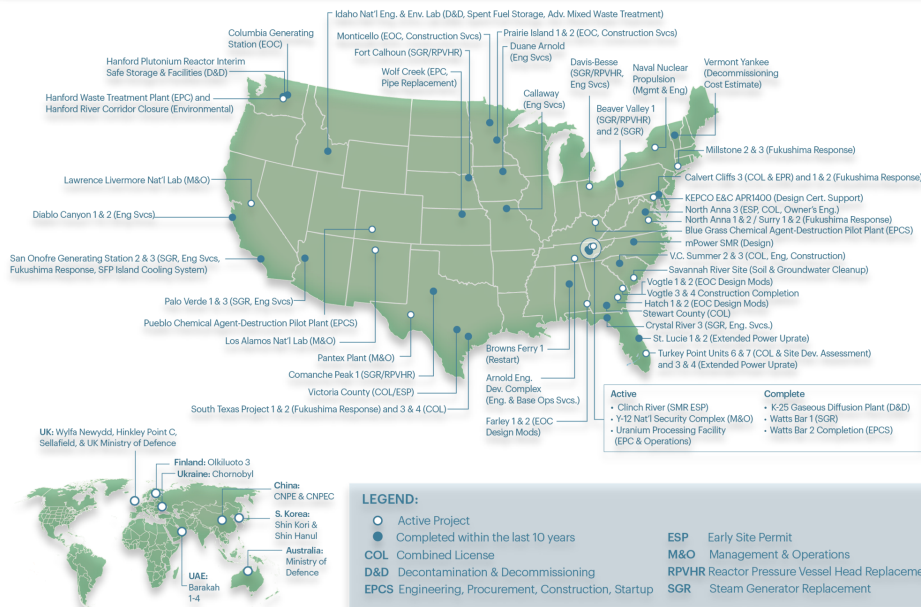
BECHTEL NUCLEAR, SECURITY & ENVIRONMENTAL



ADVANCED NUCLEAR | SUPPLIER

Bechtel's Nuclear, Security & Environmental global business unit leverages Bechtel's six decades in the nuclear industry to execute both commercial and government projects across the nuclear lifecycle. Bechtel's commercial nuclear power division is a global leader in the licensing, design, procurement, and construction of nuclear power plants, whether it is new build, plant completion or recovery, modifications to existing facilities, or advanced reactor technology development.

Bechtel Nuclear, Security & Environmental has more than 50 active and recently completed projects since 2007



Location: Reston, VA

Founded: 1898

Principal/CEO: Barbara Rusinko

Major Customers: Non-disclosed

Federal Engagement: DOE, NRC, ARPA-E, DOD

Preferred Point of Contact: Muhammad Fahmy | mgfahmy@bechtel.com | 703-429-6859

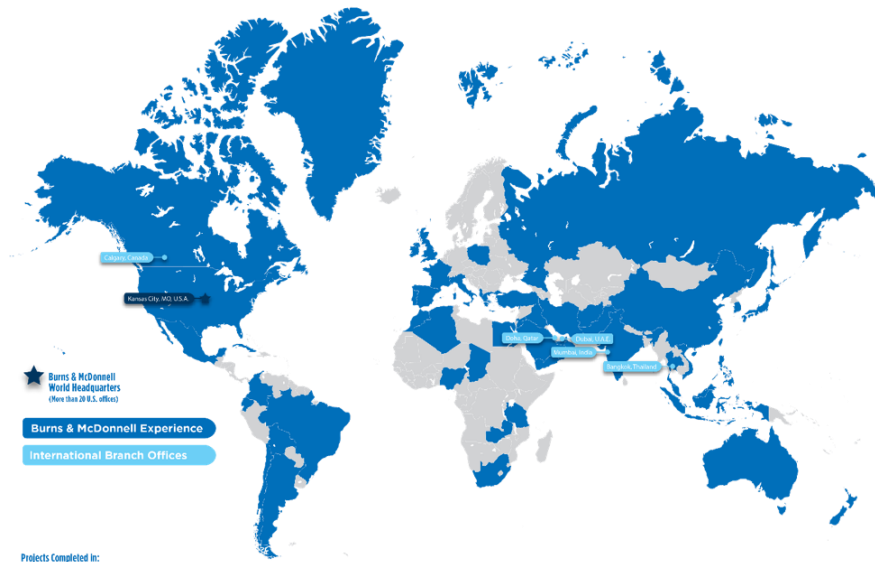
www.bechtel.com

BURNS & MCDONNELL



Burns & McDonnell is a worldwide leader in engineering and construction with over 10,000 employee-owners in over 60 offices across the U.S. and throughout the world. At Burns & McDonnell, our engineers, architects, scientists and construction professionals do more than plan, design and implement. With a mission that remains unchanged since our founding in 1898 - Make Our Clients Successful - our team partners with you on the toughest challenges, constantly working to make the world an amazing place.

World Energy Experience



Location: Kansas City, MO; Other worldwide offices

[https:// www.burnsmcd.com](https://www.burnsmcd.com)

Founded: 1898

Principal/CEO: Ray Kowalik

Major Customers: X-energy, UAMPS/CFPP, Ameren-Callaway, Evergy-Wolf Creek, APS-Palo Verde

Federal Engagement: DOE, INL, DOD, NRC, Other

Preferred Point of Contact: Glenn Neises | gneises@burnsmcd.com

BWX TECHNOLOGIES, INC.



BWXT has been involved in the nuclear industry since its beginning. As a federal contractor, BWXT provides nuclear components and fuel for the U.S. Navy's submarine and aircraft carrier fleet. Commercially, BWXT manufactures heavy components for CANDU reactors, provides services for the U.S. and Canadian nuclear markets, and provides engineering and design capabilities for advanced reactor technologies and fuel.



ADVANCED NUCLEAR | SUPPLIER

Location: Lynchburg, VA

Founded: 1857

Principal/CEO: Rex D. Geveden

Major Customers: Non-disclosed

Federal Engagement: DOE, NRC, Other

Preferred Point of Contact: Joshua L. Parker | jl Parker@bwxt.com | 434-316-7652

<https://www.bwxt.com/>

CENTRUS TECHNICAL SOLUTIONS

ADVANCED NUCLEAR | SUPPLIER



Centrus Technical Solutions provides a one-stop shop for meeting the advanced nuclear industry's manufacturing and fuel design needs. Based on our experience with nuclear fuel, multi-physics modeling, engineering, design, advanced manufacturing, and project management, we can assist with the design and manufacture of critical components as well as the business planning, design, and licensing of facilities to produce new fuels. From design and engineering to NQA-1 compliant manufacturing, Centrus Technical Solutions is your trusted, full-service partner.



Location: Oak Ridge, TN

Founded: 1998

Principal/CEO: Larry Cutlip (Vice President Field Operations)

Major Customers: Non-disclosed

Federal Engagement: DOE, GAIN, NRC, Oak Ridge National Laboratory

Preferred Point of Contact: Mark McClure | mclureml@centrusenergy.com | 865-241-7095

<https://www.centrusenergy.com/>

CERAMIC TUBULAR PRODUCTS



Ceramic Tubular Products develops and supplies very high temperature ceramic tubes and materials for existing and future nuclear and solar thermal applications.



ADVANCED NUCLEAR | SUPPLIER

Location: Lynchburg, VA

Founded: 2006

Principal/CEO: Jeffrey Halfinger

Major Customers: Non-disclosed

Federal Engagement: DOE, GAIN

Preferred Point of Contact: Jeffrey Halfinger | 424-239-1979

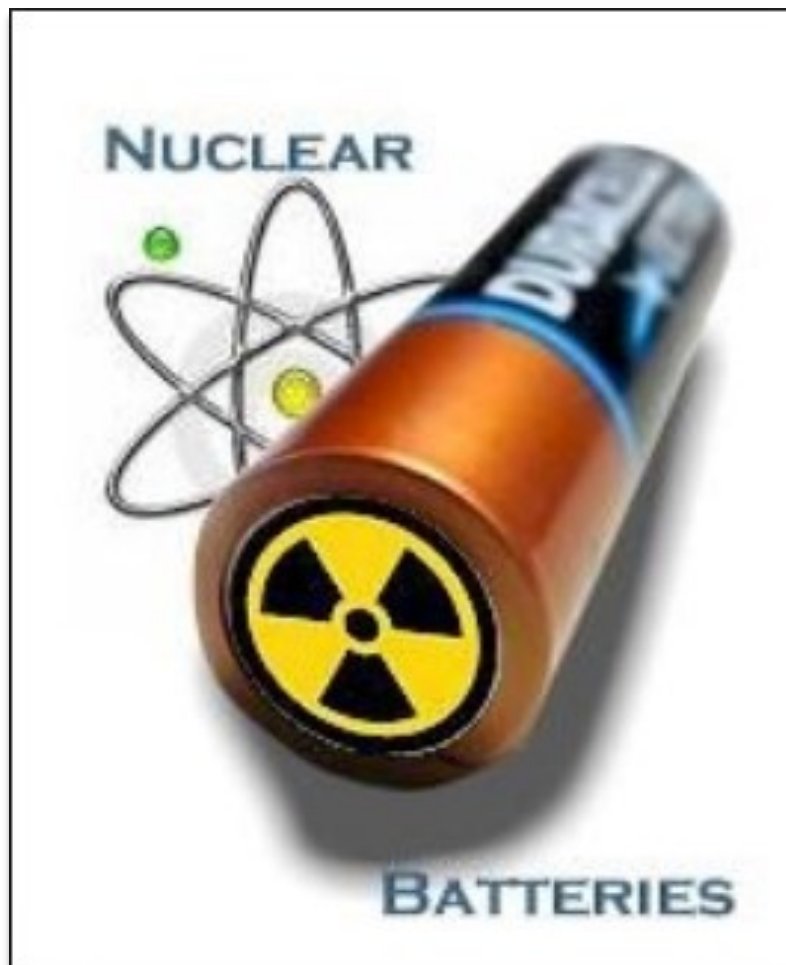
<https://www.ctp-usa.com/>

COMPETITIVE ACCESS SYSTEMS, INC.

ADVANCED NUCLEAR | SUPPLIER



Competitive Access Systems (CAS), Inc. develops self-recharging nuclear battery technologies.



Location: Wylie, TX

Founded: 1996

Principal/CEO: Eric Delangis

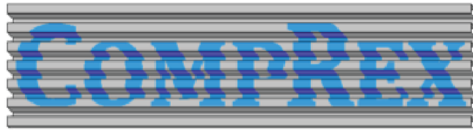
Major Customers: Non-disclosed

Federal Engagement: Non-disclosed

Preferred Point of Contact: Linda Delangis | ldelangis@neukenergy.com

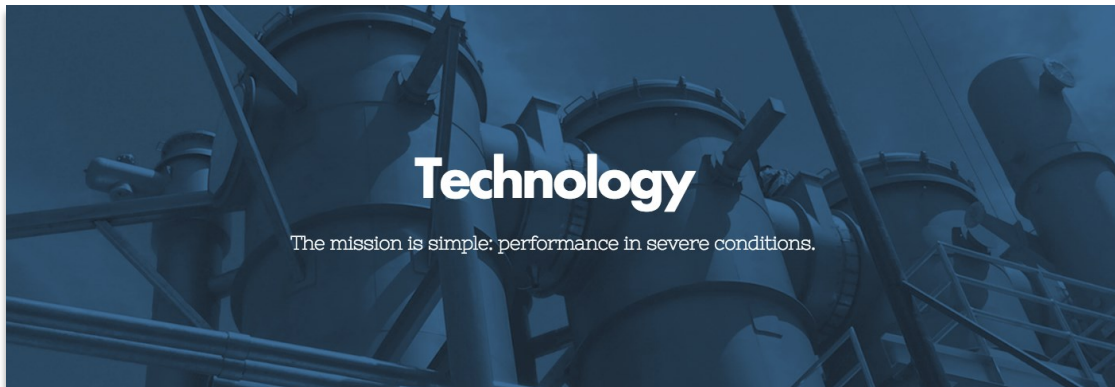
<https://www.competitiveaccesssystems.com>

COMPRES, LLC



FinRex® and ShimRex® Technologies

CompRex, LLC designs custom compact heat exchangers and compact heat exchange reactors for a wide range of chemical process applications where efficient heat transfer is critical.



ADVANCED NUCLEAR | SUPPLIER

Location: De Pere, WI

Founded: 2014

Principal/CEO: Zhijun Jia

Major Customers: Non-disclosed

Federal Engagement: DOE, GAIN

Preferred Point of Contact: Zhijun Jia | Zhijun.jia@compres-llc.com

<https://www.compres-llc.com>

CONCURRENT TECHNOLOGIES CORPORATION



*Concurrent
Technologies
Corporation*

Concurrent Technologies Corporation (CTC) is recognized as one of the world's premier nonprofit applied scientific research and development organizations for the creation and implementation of advanced manufacturing technologies. The skills and processes developed at CTC are leveraged by the Center for Advanced Nuclear Manufacturing (CANM) to benefit both the emerging SMR/AR industry and the legacy reactor fleet.

Developing and transitioning innovative manufacturing solutions to benefit both the SMR/AR industry and the legacy reactor fleet

Location: Johnstown, PA

Founded: 1987

Principal/CEO: Edward J. Sheehan, Jr.

Major Customers: Non-disclosed

Federal Engagement: DOE, GAIN

Preferred Point of Contact: Robert Akans | canm@ctc.com

<http://www.ctc.com/>

CURTISS-WRIGHT

CURTISS - WRIGHT

ADVANCED NUCLEAR | SUPPLIER

Curtiss-Wright has supported the commercial nuclear power industry since its inception. We continue to make plants safer, more efficient, and more reliable across the globe. With more than 60 years of experience in power generation, we have significantly broadened our product offerings in the commercial nuclear power market over time - through acquisition, innovation, and organic growth. Our offerings include everything from commercial off-the-shelf seals to custom engineered control rod drive mechanisms, from analog instruments to FPGA-based Digital Control Systems.

Our Quality Assurance programs are maintained at the highest standards of excellence in support of rigorous industry requirements. We meet 10CFR50, Appendix B; ASME NQA-1; and ASME Sections III and XI. We possess ASME N, NPT, NR, NS, UV, and VR Certificates, including Material Organization (QSC-614) capabilities. Our quality programs meet the requirements of countries such as Canada, France, China, and Russia, and are NUPIC and NIAC audited.

Today, Curtiss-Wright has installations at hundreds of nuclear plants in over 25 countries worldwide.



Location: Global

Founded: 1929

Principal/CEO: Lynn Bamford, CEO

Major Customers: Exelon, Entergy, TVA, KHNP, OPG, Bruce Power, Bechtel

Federal Engagement: DOE, DOD, NRC

Preferred Point of Contact: Gary Wolski / gwolski@curtisswright.com

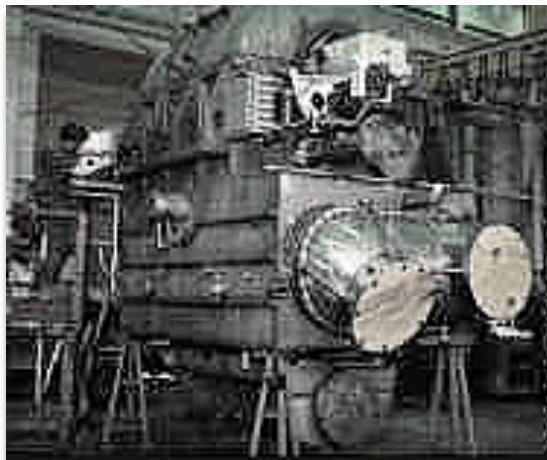
<https://www.cwnuclear.com/>

DC FABRICATORS, INC.



ADVANCED NUCLEAR | SUPPLIER

DC Fabricators manufactures heat exchange equipment for the power generation and defense industries. DCF specializes in small to medium size cylindrical and rectangular condensers and heat exchangers for industrial and cogeneration applications, geothermal power plants, large main station condensers (to over 500,000 sq.ft.), process heat exchangers with pressures over 2,000 psi, and nuclear power systems. DCF's backs up its manufacturing capabilities with complete engineering analysis and design capabilities that conform to ASME Code, TEMA Standards, HEI Standards for Steam Condensers, and International Codes and Standards.



Location: Florence, NJ

Founded: 1993

Principal/CEO: Gary Butler

Major Customers: US Navy, General Dynamics, Bechtel, Huntington Ingalls, Talen Energy, NPPD, Southern Illinois Power, Eastman Chemical

Federal Engagement: DOE, DOD

Preferred Point of Contact: Derrick Phillips / dphillips@dcfab.com / 609-499-3000 ext. 225

<https://www.dcfab.com/>

DUBOSE NATIONAL ENERGY SERVICES



ADVANCED NUCLEAR | SUPPLIER

DuBose National Energy Services, Inc (DNES), an ASME certificate holder since 1977, proudly offers quality products with exceptional (24/7/365) service. DNES carries one of the largest, most diversified inventories of nuclear qualified material in North America. DNES stocks sheet, plate, bar, pipe, fittings, flanges, structural shapes, tubing, fasteners, weld filler metal and Unistrut® metal framing products. DNES supports common carbon and alloy steel to highly corrosive-resistant stainless; nickel alloys to aluminum, copper and bronze. In addition, DNES offers many value-added services from machining, fabricating, sawing, burning, cleaning, blasting, painting, heat treating, in-house testing (including NDE), and reverse engineering. DNES products and services are offered under a comprehensive quality program based on ASME Section III, NCA/ WA-3800 and 4000 and accreditation through our approved 'N-type' certificates (NA, NPT and NS); 10CFR50 Appendix B; ASME NQA-1; ANSI N45.2; CSA N299.2/3; & MIL-I-45208A. DNES is also accredited under AISC and AWS, as well as ASME Section VIII (Pressure Vessels, Division 1 – U & R Stamps). DNES is NUPIC and NIAC Audited.



Location: Clinton, NC

Founded: 1990

Principal/CEO: Richard Rogers, President | Beau Laslo, General Manager
Jashua Grimm, Director of Quality

Major Customers: **USA:** All nuclear utilities, DOE, DOD, National Labs and ~300 OEM's/Fabricators/EPC's who support USA nuclear programs. **Canada:** All nuclear utilities, National Labs and ~75 Canadian OEM's/Fabricators/EPC's who support Canada's nuclear programs. **Worldwide:** Several Utilities and OEM's/Fabricators/EPC's nuclear programs.

Federal Engagement: DOE, DOD

Preferred Point of Contact: Beau Laslo | beau.laslo@dubosenes.com | 910-590-2151

<https://www.dubosenes.com/>

ED FAGAN INC.



Distributor and manufacturer of Controlled Expansion, Magnetic and Refractory Metals and Alloys. Ed Fagan Inc. has facilities in Franklin Lakes, NJ and Los Alamitos, Ca.

If you need specialty metals or special purpose alloys for Aerospace/Aviation, Defense, Electronics, Ceramic, Heat Treating, Magnetic, Medical, Lighting, Optical, Telecommunications, or other high-technology, industrial application, call Ed Fagan Inc.

EFI has supplied specialty metals, alloys, and hard-to-locate materials to these markets since 1965. We have a large comprehensive inventory of Controlled Expansion Alloys, Electrical/Electronic Grade Nickel; as well as Soft Magnetic Alloys, and Refractory Metals and Alloys. We stock the highest quality materials available in forms such as: Bar, Rod, Sheet, Plate, Strip, and Wire... from the highest quality mills such as VDM Metals GmbH and Carpenter Technology Corp. And, we stock these materials in many gauges, widths/lengths, and conditions for immediate delivery.



Location: Franklin Lakes, NJ

Founded: 1965

Principal/CEO: Ed Fagan, President

Major Customers: Argonne National Laboratories, Sandia National Laboratories, Lawrence Livermore National Laboratories, General Electric

Federal Engagement: DOE, ARPA-E, NRC

Preferred Point of Contact: Richard Manberg | richard@edfagan.com | 201-891-4003

Shant Simonian | shant@edfagan.com | 562-431-2568

<https://www.edfagan.com/>

ENERCON



Excellence—Every project. Every day.

ENERCON is a multi-discipline engineering and environmental firm focused on empowering our people and partnering with our clients to support the safe and efficient production, delivery and use of energy. As the world moves towards more sustainable, energy-efficient infrastructure, ENERCON actively works to advance the nuclear industry through engineering support for advanced and small modular reactors (SMR). Since ENERCON was formed in 1983, ENERCON has been one of the largest engineering firms supporting the U.S. commercial and federal nuclear marketplace. ENERCON is an industry leader in providing engineering, licensing, and environmental services to numerous advanced nuclear projects.

ENERCON has performed site and nuclear technology selection studies, developed design certification applications, license applications, and environmental reports for advanced nuclear. ENERCON also has substantial engineering experience supporting advance nuclear clients with plant integration engineering, system and component engineering, codes and standards, PRA, and safety analysis. Our long list of satisfied clients has been built on our solid reputation as a premier provider of high quality, cost effective services.



ADVANCED NUCLEAR | SUPPLIER

Location: Kennesaw, GA

Founded: 1983

Principal/CEO: Robert Bryan

Major Customers: Non-disclosed

Federal Engagement: DOE, GAIN, NRC

Preferred Point of Contact: Jay Basken, P.E. | jbasken@enercon.com | 770-880-9351

Nathan Jackson, P.E. | njackson@enercon.com | 985-778-6301

<https://www.enercon.com/>

ENGINEERING MECHANICS CORPORATION OF COLUMBUS



Engineering Mechanics Corporation of Columbus (Emc²) is an employee-owned engineering research and development consulting company focused on materials, structural integrity and reliability of complex systems. We provide high quality engineering services and products that are innovative and responsive to our clients' schedule and budgetary requirements. Emc² nurtures creativity, continually invests in staff development and new technologies, and collaborates with our clients to assemble the best combination of experts to solve critical problems for the commercial and governmental communities we serve. We have extensive experience in high temperature computational damage and fracture modeling along with extensive test facilities. We helped develop the NRC's xLPR probabilistic leak before break code.

Since our founding in the last century, Emc² has always taken pride in our leadership role on various Codes and Standards setting committees. We remain committed to our mission to provide experimental, computational, reliability and analytical solutions to client needs while also supporting societal goals of insuring safe operations of systems of all sizes and complexity.



*Engineering Mechanics Corporation of Columbus
Laboratory Facilities*



*Engineering Mechanics Corporation of Columbus
At Sunset*

Location: Columbus, OH

Founded: 1998

Principal/CEO: Gery Wilkowski , CEO, F.W. Brust, Principal

Major Customers: Energy Industry (US NRC, Department of Energy, US Navy Nuclear, National Aeronautics and Space Administration, Department of Transportation, Heavy Industry, Medical Industry, International Nuclear Regulators.

Federal Engagement: DOD, Navy, NASA

Preferred Point of Contact: Frederick (Bud) Brust | bbrust@emc-sq.com | 614-459-3200

<https://www.emc-sq.com/>

ENGINEERING PLANNING and MANAGEMENT



ADVANCED NUCLEAR | SUPPLIER

EPM is a multi-discipline, ASME NQA-1:2015 and ISO 9001:2015 compliant, engineering company specializing in fire protection and fire modeling, probabilistic risk assessment (PRA), safe shutdown / electrical separation analysis, chemical process safety, and software development. Our cross-functional teams allow EPM to provide integrated specialty engineering and software solutions to assist our U.S. and international customers with regulatory compliance, design certification, risk management, and process efficiency at their facilities. We have built a reputation as a well-respected engineering services and software provider to U.S. and international customers for over 35 years.

EPM
Engineering Planning and Management, Inc. ONET GROUP www.epm-inc.com

Providing cost-effective solutions for safe and reliable operation of nuclear power plants for over 35 years.

EXPERTS IN FIRE SAFETY, RISK ANALYSIS, AND RISK MANAGEMENT

- Fire Safe Shutdown Analysis
- PRA/PSA, Internal Event, External Event, Fire PRA, and Seismic PRA
- Fire Protection System Design
- Fire Modeling (FDI, FDS, CFAST)
- Safety Classification (Q-List/10CFR 50.69)
- 4b, Risk Informed Technical Specification Completion Time
- 5b, Risk Informed Surveillance Frequency Control Program
- PRA F&O Closeout Reviews
- Design Certification Support
- Environmental Qualification (EQ, 10CFR 50.49)
- Analysis & Design Calculations

SOFTWARE SOLUTION TOOLS

- EDISON - Cable, Wire, and Raceway Management System
- SAFE - Post Fire Safe Shutdown Analysis
- Milieu - Environmental Qualification
- CAMP - Cable Aging Management
- VIPER - Tablet Based Pre-Fire Plans.
- PILOT - Permit Implementation, Logic, Oversight and Tracking

Location: Framingham, MA

Founded: March, 1980

Principal/CEO: Robert Kalantari

Major Customers: Non-disclosed

Federal Engagement: DOE, NRC

Preferred Point of Contact: Alan Jelalian | ahj@epm-inc.com | 508-532-7131

<https://www.epm-inc.com/>

EXCEL SERVICES CORPORATION



EXCEL Services Corporation (EXCEL) has vast domestic and international technical, licensing, and regulatory experience, working with regulatory bodies including the U.S. NRC, IAEA, STUK, Canadian Nuclear Safety Commission, and many others. EXCEL has worked with numerous nuclear plant designers and operators to develop and implement technical, licensing, and regulatory strategies for all phases of the nuclear plant life cycle, from design certification, initial licensing, license renewal, to decommissioning. EXCEL combines a broad and deep knowledge of the industry with world-class technical expertise, problem-solving consultants, and cost saving mechanisms to create high impact solutions to solve difficult challenges faced by energy production and other critical infrastructure clients.



Location: Rockville, MD

Founded: 1985

Principal/CEO: Donald R. Hoffman

Major Customers: EXCEL has supported all the US nuclear utilities and over 27 countries worldwide.

Federal Engagement: DOE, NRC

Preferred Point of Contact: Jim Andersen | jim.andersen@excelservices.com | 301-984-4400

<https://www.excelservices.com/>

EXYN TECHNOLOGIES



Exyn Technologies is pioneering autonomous aerial robot systems for complex, GPS-denied environments. The company's full-stack solution enables flexible deployment of single or multi-robots that can intelligently navigate and dynamically adapt to complex environments in real-time. Exyn's autonomous robotic solution can integrate specialized sensors (temperature, radiological, IR, visual camera) to record data in dangerous or conventionally inaccessible locations. That data will be placed / visualized / georeferenced in 3D space onto of the survey grade point cloud for easy consumption and analytics.



ADVANCED NUCLEAR | SUPPLIER

Location: Philadelphia, PA

Founded: 2014

Principal/CEO: Nader Elm

Major Customers: Mining Space: Dundee Precious Metals, Vale, etc.

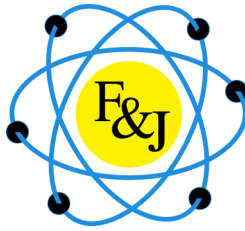
Nuclear: Demonstration of Technology with EPRI

Federal Engagement: Other

Preferred Point of Contact: Harry Erhardt | herhardt@exyntechologies.com

<https://www.exyn.com/>

F&J SPECIALTY PRODUCTS, INC.



ISO9001:2015 certified manufacturer of traditional and microprocessor controlled air sampling and airflow calibration instruments, air sampling accessories and consumables. Products include portable and fixed-station low volume and high volume air samplers, PAS, tritium and C-14 systems. Consumables include charcoal and silver zeolite radioiodine collection cartridges and particulate filter media.

ADVANCED NUCLEAR | SUPPLIER



Location: Ocala, FL

Founded: 1979

Principal/CEO: Frank M. Gavila

Major Customers: Non-disclosed

Federal Engagement: DOE, EPA, Other

Preferred Point of Contact: fandj@fjspecialty.com | 352-680-1177

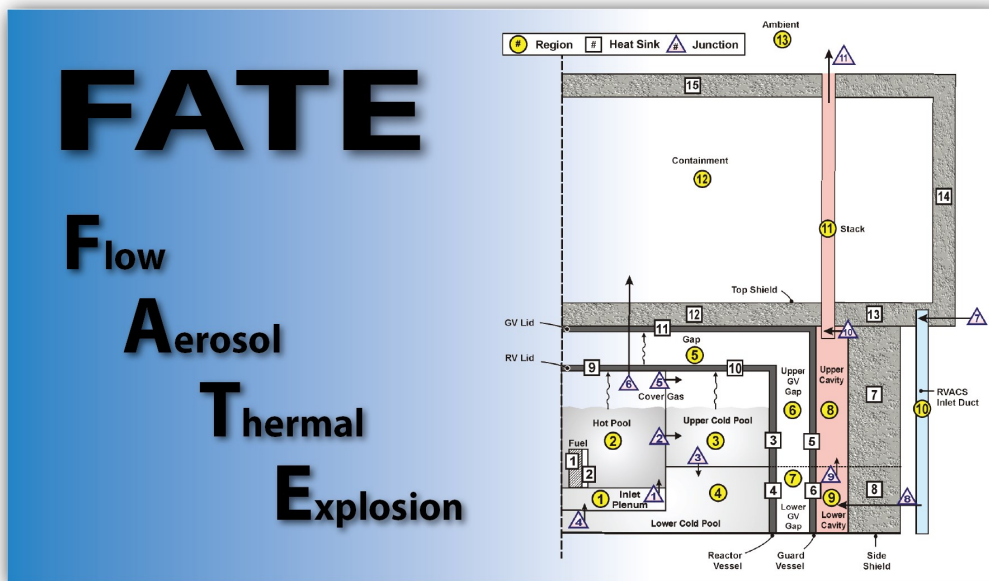
<http://www.fjspecialty.com/>

FAUSKE & ASSOCIATES, LLC



ADVANCED NUCLEAR | SUPPLIER

FAI specializes in modeling and analyzing both power and non-power nuclear facilities, including light water and liquid metal cooled reactors (LMRs), spent fuel, legacy waste processing, and storage facilities. FAI developed FATE, a facility and process modeling code originally created to support design and safety analyses of spent fuel, tank waste, vitrification, and special materials at DOE's Hanford site. Recently, under a GAIN voucher, FATE was coupled with a LMR accident analysis code to provide mechanistic source term analysis capability for licensing purposes.



Location: Burr Ridge, IL

Founded: 1980

Principal/CEO: John Fasnacht

Major Customers: Westinghouse, Kairos, Sellafield, Hanford, Korea Atomic Research Institute (KAERI)

Federal Engagement: DOE, GAIN, NRC

Preferred Point of Contact: Jim Burelbach | burelbach@fauske.com

<https://www.fauske.com/>

FISHER CONTROLS



EMERSON™

Fisher valve and instrument technologies are born from Emerson's passion to increase your process safety and efficiency, by defining the industry with more than 140 years of trusted innovations and forging the future of flow control solutions. We know the consequences of process failure are great, that's why we have an unwavering commitment to standards and processes that ensure innovative and reliable product designs. Many years from now, as the Fisher™ brand is put onto products, users will continue to know it stands for integrity.



Location: Marshalltown, IA

Founded: 1880

Principal/CEO: Kevin G. Meyer, Principal | Lal Karsanbhai, CEO

Major Customers: All sanctioned nuclear utilities across the globe

Federal Engagement: NRC

Preferred Point of Contact: Michael Hagen | Michael.hagen@emerson.com | 641-754-3355

<https://www.fisher.com>

FISONIC ENERGY SOLUTIONS - POWER SYSTEMS DIVISION



Fisonic Energy Solutions designs pumping systems for power plants that require only heat to operate (no electricity), and use waste heat as a power source where possible.



ADVANCED NUCLEAR | SUPPLIER

Location: Waltham, MA

Founded: 2016

Principal/CEO: Ed Pheil (CTO)

Major Customers: Non-disclosed

Federal Engagement: Other

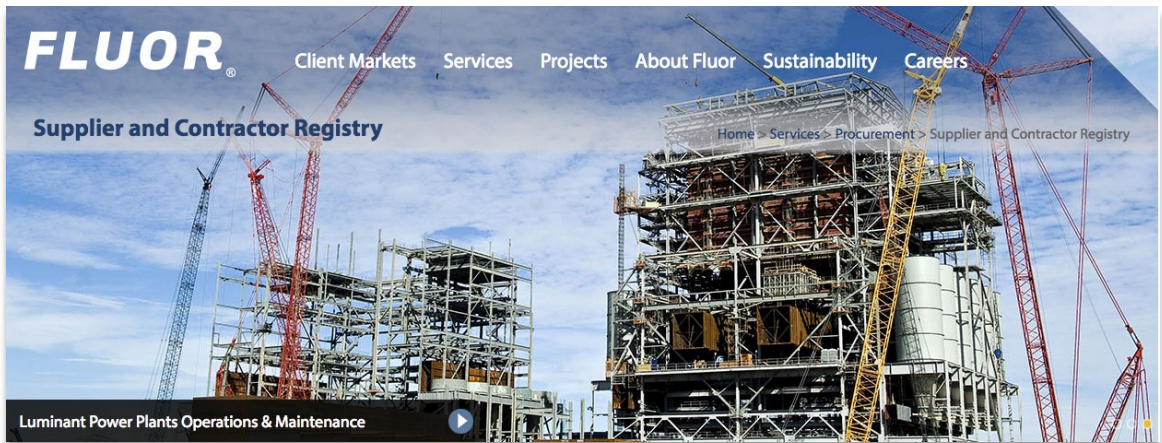
Preferred Point of Contact: Ed Pheil | ed.pheil@fisonic.us | 212-732-3777

<http://www.fisonicus.com>

FLUOR



Fluor is one of the world's largest publicly-traded engineering, procurement, fabrication, construction (EPFC) and maintenance companies, offering integrated solutions for clients' projects. For the past 70 years, Fluor has executed some of the most complex and challenging projects in the nuclear industry.



Location: Global
Founded: 2012
Principal/CEO: David Seaton
Major Customers: Non-disclosed
Federal Engagement: DOE, NRC, Other
Preferred Point of Contact: Brad Porlier | brad.porlier@fluor.com

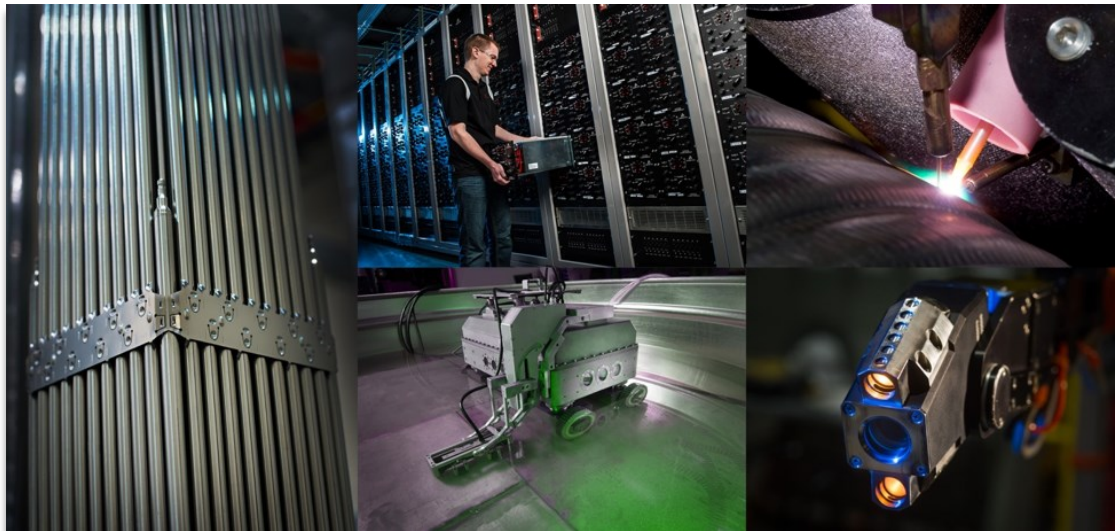
<https://www.fluor.com/>

FRAMATOME



ADVANCED NUCLEAR | SUPPLIER

Framatome is a major international player in the nuclear energy market recognized for its innovative solutions and value-added technologies for designing, building, maintaining, and advancing the global nuclear fleet. The company designs, manufactures, and installs components, fuel and instrumentation and control systems for nuclear power plants and offers a full range of reactor services. Framatome is innovating to design the reactors of tomorrow. Our activities include reactor design, systems engineering, SMR fuel development, and industry counsel to help progress licensing and commercialization of advanced reactors in the United States.



Location: Nationwide

Founded: 1989

Principal/CEO: Gary Mignogna

Major Customers: Non-disclosed

Federal Engagement: DOE, GAIN, ARPA-E, NRC, Other

Preferred Point of Contact: Darryl Gordon | darryl.gordon@framatome.com | 434-832-5199

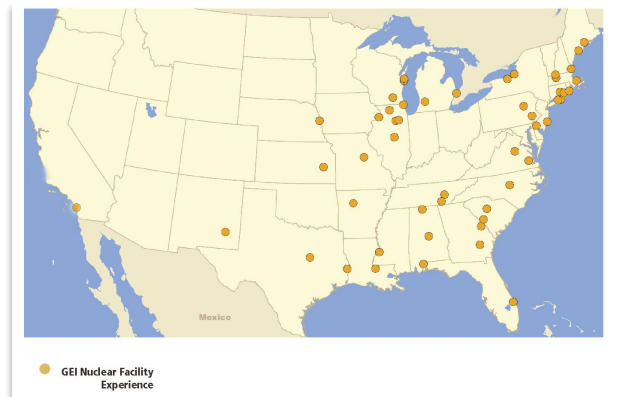
<https://www.framatome.com/>

GEI CONSULTANTS, INC.

ADVANCED NUCLEAR | SUPPLIER



Our multi-disciplined team of engineers and scientists deliver integrated geotechnical, environmental, water resources, and ecological engineering solutions to diverse clientele nationwide. GEI recognizes the need to provide safe, clean, secure, base load electric power to influence our environment and has made a commitment to provide resources to support this need. GEI provides services with a focus on client success by integrating experienced project managers into our clients' team. Our services for nuclear facilities include: Site Characterization/Selection; Seismic Stability and Liquefaction Analysis; Foundation Investigation; Design for Static and Seismic Loading; Vibration Analysis; Excavation Support; Geohydrologic and Hydrologic; Licensing Support; Embankment Design and Rehabilitation; Preparation of Plans and Specifications; Field Instrumentation Installation and Monitoring; Construction Observation and Consultation; Environmental and Ecological Services; and Decommissioning. GEI has had a Nuclear Quality Assurance Manual since 1972 and we provide all our services under a client-audited Quality Assurance Program (QAP) that meets the requirements of 10 CFR Part 50 Appendix B, ASME NQA-1-1994 and ANSI N45.2-1977. We have firmly established a reputation amongst the industry for achieving excellent results, inspired problem-solving, and outstanding client satisfaction.



Location: Woburn, MA

Founded: 1970

Principal/CEO: Ron Palmieri

Major Customers: Holtec International, TVA, Entergy, Exelon, Bechtel, and Orano

Federal Engagement: DOE, NRC, USACE, EPA, DOJ, TVA

Preferred Point of Contact: Chad R. Conti | cconti@geiconsultants.com

Leslie A. Lombardo | llombardo@geiconsultants.com

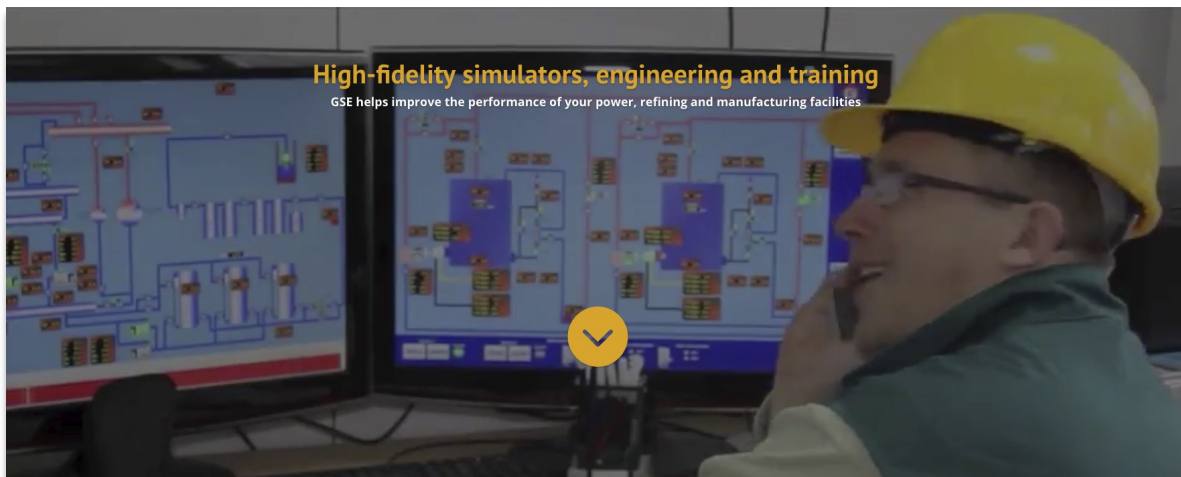
<https://www.geiconsultants.com/>

GSE PERFORMANCE SOLUTIONS, INC.



ADVANCED NUCLEAR | SUPPLIER

GSE is the world leader in simulation systems and solutions for the nuclear power industry. GSE's technology allows the end user to conduct engineering and design studies, conduct "what if" analyses and train personnel to exacting standards. GSE's technology is critical for customers to improve load factors, reduce operational risk and lower operating costs.



Location: Sykesville, MD

Founded: 1994

Principal/CEO: Kyle Loudermilk

Major Customers: Non-disclosed

Federal Engagement: DOE, GAIN, ARPA-E, NRC

Preferred Point of Contact: Jay Umholtz | jay.umholtz@gses.com

<https://www.gses.com/>

GUTOR ELECTRONIC LLC

GUTOR

by **Schneider** Electric

Gutor Electronic LLC is the low-cost, high-quality supplier of Environmentally Qualified, Safety-Related emergency and back-up electrical power; to include Battery Chargers, Inverters, and UPS systems.



ADVANCED NUCLEAR | SUPPLIER

Location: Houston, TX

Founded: 1946

Principal/CEO: Finn Joergensen

Major Customers: Los Alamos National Laboratory, Entergy, Constellation, Idaho National Laboratory Hanford, Duke Energy, Sothern Nuclear, Dominion

Federal Engagement: DOE, GAIN, NRC

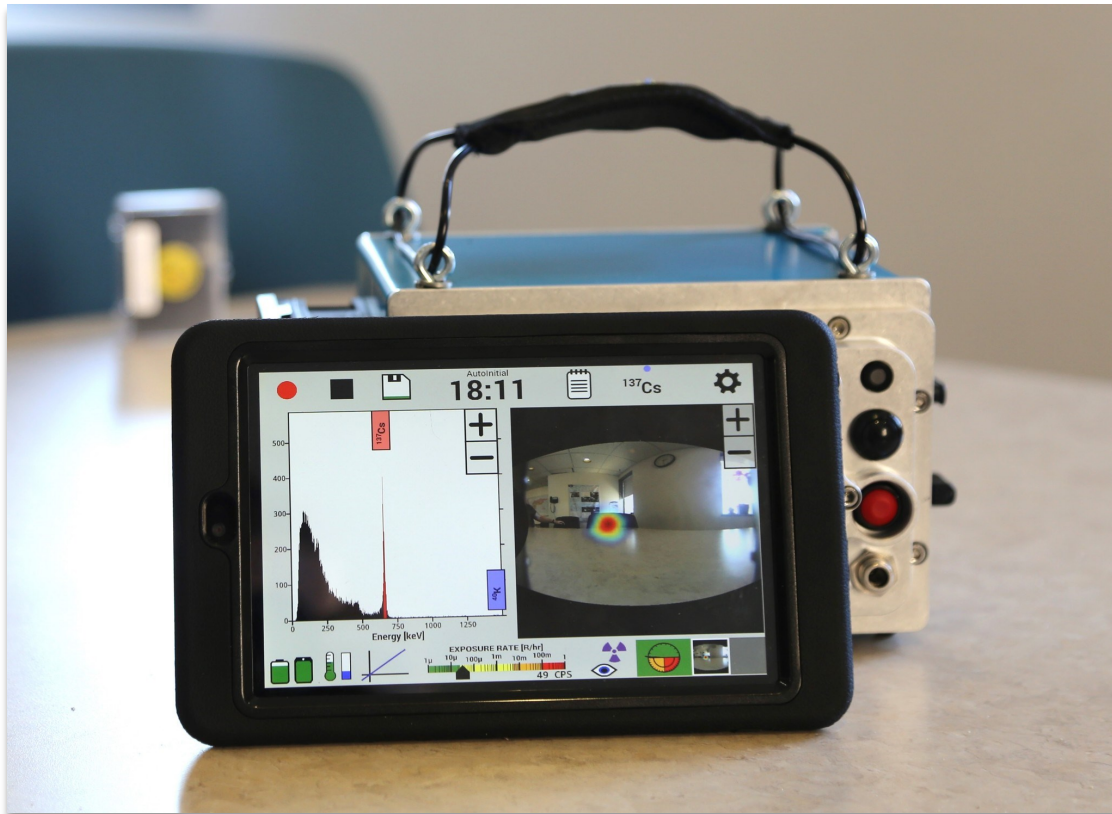
Preferred Point of Contact: Mike May | michael.may@se.com | 865-230-3582

<https://www.gutor.com>

H3D, INC.



H3D offers the world's highest-performance imaging spectrometers. Quickly identifying and localizing gamma-ray sources with a single measurement, H3D is revolutionizing how measurements are performed. H3D detectors are used in over half of U.S. nuclear power plants.



ADVANCED NUCLEAR | SUPPLIER

Location: Ann Arbor, MI

Founded: Non-disclosed

Principal/CEO: Willy Kaye

Major Customers: Non-disclosed

Federal Engagement: DOE

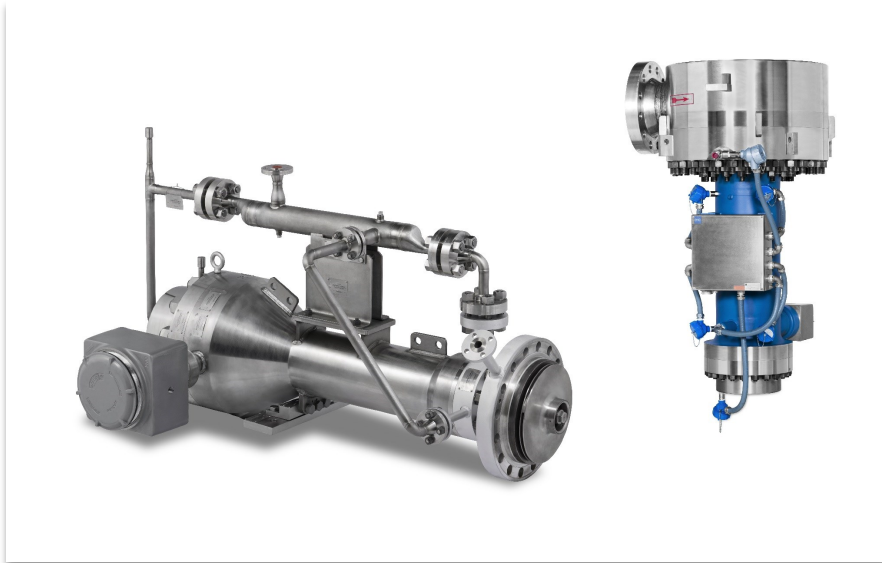
Preferred Point of Contact: Andy Boucher | andy@h3dgamma.com | 734-661-6416

<https://www.h3dgamma.com/>

HAYWARD TYLER, INC.



Design, engineer and manufacture of pumps, motors, vessels, and other process equipment in accordance with ASME Codes and Standards. This includes Section III, Div. 1 and Div. 5. Hayward Tyler combines decades of nuclear pump and vessel operating experience with trained engineers using state-of-the-art computer aided design tools. These tools — including Computational Fluid Dynamics (CFD), rotor dynamics, and Finite Element Analysis (FEA) — enable us to engineer safe and reliable pump, motor, and vessel solutions for advancing nuclear energy technology. Whether your project requires limited scope engineering efforts, or clean sheet design and build of novel pump, motor, and vessel technology, Hayward Tyler has the in-house engineering, manufacturing, and test capabilities to deliver on your unique challenges.



Location: Colchester, VT

Founded: 1970

Principal/CEO: Drew Van Norman

Major Customers: Southern Company, Dominion energy, Constellation Energy, Korea Hydro & Nuclear Power, TerraPower, Idaho National Labor, Bechtel Marine Propulsion, ITER, Duke Energy

Federal Engagement: DOE, GAIN, ARPA-E, NRC

Preferred Point of Contact: Jeffrey Belotti, Sales Director | jeffrey.belotti@haywardtyler.com

Office: 802-655-4444 (x)141 | Mobile 201-446-9757

<https://www.haywardtyler.com/>

HIGH TEMPERATURE SYSTEM DESIGNS, LLC




ADVANCED NUCLEAR | SUPPLIER


High Temperature Systems Designs (HTSD) are an Engineering and Design company with over Seventy years of combined experience. Our team is made up of Daniel Barth, Business Development Manager/Owner, William Nagle, Chief Technical Officer and Danielle Barth, Research Analyst.

HTSD developed and manufactured specialized pumping systems for high temperature and hazardous material applications. Our understanding of designing and manufacturing of such critical equipment comes from working for and with such companies as Rheinlutte Pumps, Nagle Pumps, Friatec Valves, Ensival-Moret Pumps, Sandia National Labs, Rocketdyne, Nexant Bechtel, Oakridge National Labs and many other research facilities and Universities.


HTSD designed, constructed and commissioned systems at Sandia National Labs, Shell Global Solutions research Facility in Houston, TX, Plataforma Solar de Almera in Spain, ENEA in Italy and many labs scales systems at our universities.



High Temperature System Designs, LLC



Dan Barth is Business Development Manager of High Temperature System Designs, LLC. He has over 40 years of designing, engineering and manufacturing of custom high temperature molten salt and molten sodium pumping systems for niche markets such as solar, nuclear power generation, industrial applications using high temperature fluids to heat or cool their processes and many applications to manufacture metal elements such as magnesium and titanium. He has worked and lectured at many National Labs and universities on high temperature applications and custom manufactured parts from high alloy and ceramics materials.



William Nagle is Chief Technical Officer of High Temperature System Designs LLC. He has 24 years of experience designing and qualifying custom high temperature process equipment in the conventional, solar, and nuclear energy sectors. He specializes in fluid handling, conditioning, and instrumentation in extreme environments, and has managed engineering groups at universities and national energy labs. He has a Master of Science in Mechanical Engineering from Stanford University, and a MBA from University of Chicago.

Tel: 219-365-7669 Cell 727-776-7952 Email: danbarth001@gmail.com

Location: St. John, IN

Founded: 2015

Principal/CEO: Daniel Barth

Major Customers: Sandia National Labs, Oak Ridge National Labs, National Renewable Energy Lab, Argonne National Labs, Shell Oil. TerraPower, ThorCon, Flibe Energy, Hayward Tyler Inc., Powdermet, Nagle Pumps Inc., Rheinlutte Pumps

Federal Engagement: DOE, ARPA-E

Preferred Point of Contact: Daniel Barth | danbarth001@gmail.com |

Direct 219-365-7669, Cell 727-776--7952

<http://www.hightemperaturesystemdesigns.com/>

HOLTEC INTERNATIONAL



Holtec's SMR-160 is a robust small modular reactor that delivers 160 MW net electric in a small footprint. SMR-160 is based on pressurized water reactor technology and uses low enriched uranium fuel to provide reliable, affordable and carbon-free energy. The SMR-160 is "walk-away safe," requiring no operator actions during natural disasters, man-made threats, or any of the conditions required to be considered by U.S. regulations. It is the ideal solution for sustaining economic growth worldwide. Since SMR-160 can integrate readily to both established electrical grids or as an independent distributed power source, it is well adapted for both undeveloped and developed countries. SMR160 is truly modular. The majority of the plant's equipment and structures are factory



-fabricated and can be delivered to each site in segments. An SMR-160-based site can easily be expanded with additional units to meet current and future demand. Please visit www.smrllc.com for more information.

Location: Camden, NJ

Founded: 1986

Principal/CEO: Dr. Krishna P. Singh

Major Customers: Worldwide

Federal Engagement: DOE, NRC

Preferred Point of Contact: Myron Kaczmarek / m.kaczmarek@holtec.com / 856-797-0900 x 3657

<https://holtecinternational.com/products-and-services/smr/>

INFORMATION SYSTEMS LABORATORIES

INFORMATION
SYSTEMS
LABORATORIES, INC.



ADVANCED NUCLEAR | SUPPLIER

Information Systems Laboratories, Inc. (ISL) specializes in the areas of energy independence, advanced nuclear applications, space exploration, undersea technologies, surveillance and tracking, cybersecurity, and advanced radar systems. In the Energy Sector, ISL provides comprehensive areas of support to the U.S. government ranging from safety analysis and assessment of complex engineering systems to the development of regulatory structures and evaluation procedures.

ISL specializes in nuclear analysis, code development, and regulatory assistance. Typical nuclear analysis performed by ISL focuses on the following areas: thermal-hydraulics, fuel-mechanical, point and 3D neutron kinetics, nuclear plant performance and accident analysis, operational transient analysis, training simulator benchmarking, spent nuclear fuel cooling analysis, containment analysis, hydrodynamic force calculations, control system studies, and safety analysis.

ISL staff are experts in the development and use of system codes, including neutronic and control system models, with hundreds of years of combined experience. ISL currently supports the maintenance and development of computer software and analysis systems for the U.S. Nuclear Regulatory Commission (NRC) and U.S. Department of Energy (DOE)-Naval Reactors, including RELAP5, RADTRAD, TRACE, and PARCS.

ISL develops software applications and database systems for all phases of nuclear waste processing, disposal, and storage. ISL's expertise in cradle-to-grave management of nuclear waste data processing includes retrieval, characterization, certification, shipment, and disposal operations.

ISL staff are experts in risk management and system safety, including programmatic risk management, enterprise risk management (ERM), risk-informed decision making (RIDM), continuous risk management (CRM), accident precursor analysis (APA), and probabilistic risk assessment (PRA).

Location: San Diego, CA

Founded: 1982

Principal/CEO: Dr. Joseph Guerci, Ph.D.

Major Customers: U.S. NRC, U.S. DOE

Federal Engagement: DOE, NRC, NASDA, DARPA, U.S. DOT, Other

Preferred Point of Contact: Colleen Armuroso | camuroso@islinc.com | 703-448-1116

<https://www.islinc.com>

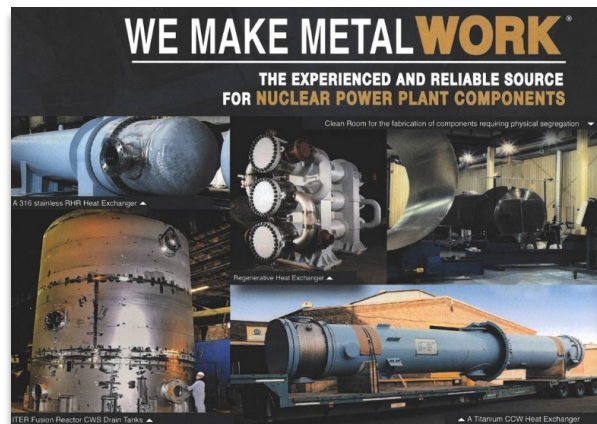
JOSEPH OAT CORPORATION

ADVANCED NUCLEAR | SUPPLIER



Joseph Oat is a world renowned OEM designer and manufacturer of fabricated ASME Section VIII and ASME Section III / NQA-1 nuclear safety-related heat exchangers, pressure vessels, tanks, canisters/casks, and other products for the Nuclear Power and Radioactive Waste Processing Industries.

Joseph Oat's range of products is quite extensive and our successful nuclear experience is unmatched in the industry. Joseph Oat excels in the supply critical heat exchangers such as regenerative & non-regenerative, residual heat removal (RHR), spent fuel pool coolers, emergency diesel generator (EDG) coolers, lube oil coolers, containment spray, letdown, SG blowdown, and large component cooling water (CCW) heat exchangers. Other product offerings include condensate tanks, air receiver tanks, accumulator vessels, liquid control tanks, surge tanks, containment air coolers, pulsation dampeners, suction stabilizers, oil tanks, fuel tanks, strainers, flow elements - orifice plate & venturi type, flow meters, structural weldments, spent fuel/rad-waste canisters/casks, and other specialty items to nuclear power utilities/plants, NSSS designers, nuclear A&E/EPC firms, the DOE national laboratories/repositories, and DOD weapons plants.



Location: Camden, NJ

Founded: January 1788

Principal/CEO: Ron Kaplan

Major Customers: DOE (National Laboratories, Repositories, Universities, etc.), GE-Hitachi, Orano, US Nuclear Power Utilities, Westinghouse

Federal Engagement: DOE, GAIN, NRC, Other, DOD

Preferred Point of Contact: John McDonald | j.mcdonald@josephoat.com | 856-371-0009

<https://www.josephoat.com/>

KINECTRICS



ADVANCED NUCLEAR | SUPPLIER

Kinectrics is the category leader in providing life cycle management services for the electricity industry. From initial design and type testing to operational deployment and maintenance services, Kinectrics collaborates closely with customers to ensure that utility assets perform safely, reliably throughout their entire life cycle.

SERVICES SUPPORTING ALL STAGES OF THE NUCLEAR POWER PLANT LIFE CYCLE



Design Engineering and Sites—Kinectrics is a Tier 1 supplier of engineering and on-site services providing consistent, cost-effective, and innovative complete solutions to clients globally.

Nuclear Safety and Licensing—Kinectrics is a market leader in North America in providing safety and licensing support to nuclear utilities.

Nuclear Equipment Solutions—Kinectrics is one of the most diverse suppliers in North America of Safety-Related parts, and can provide the following services to assist utilities with their unique parts, obsolescence and refurbishment challenges.

Materials and Major Components—Offering industry-renowned capabilities in life cycle management of major components.

Radioactive Material and Chemistry Services—A combination of CNSC licensed facilities and an ISO 17025 accredited laboratory that provides expert Analytical Chemistry, Nuclear Waste Management and Environmental services.

Inspection and Maintenance Systems—Kinectrics provides the full suite of services for the design, prototyping, development, testing, deployment and maintenance of inspection and non-destructive evaluation (NDE) systems and tooling.

Location: Etobicoke, Ontario, Canada

Founded: 2000

Principal/CEO: David Harris

Major Customers: Westinghouse, Emerson, Duke Energy, Bruce Power, Ontario Power Generation, Entergy, Wolf Creek, Callaway, TVA

Federal Engagement: DOE, GAIN, NRC

Preferred Point of Contact: Nisa Halsey | nisa.halsey@kinectrics.com |

Office phone: 416-207-6000 (x) 6315 | Mobile: 443-350-1556

David Marttila | david.marttila@kinectrics.com

Office phone: 416-207-6000 (x) 5891 | Mobile: 416-400-6894

<https://www.kinectrics.com/>

L&H INDUSTRIAL



Founded in 1964 and headquartered in Gillette, Wyoming, USA, L&H Industrial is a leader in technology innovations, custom manufacturing, and comprehensive services for heavy industrial machinery used in mining, oil and gas, railways, wind, hydro, nuclear and other industries. Today, in our third generation as a family business, we have offices and distribution partners around the world and hundreds of employees dedicated to delivering outstanding service and innovations for the biggest and hardest-working machines on the planet.

We can custom-engineer and build, from the ground up, any heavy equipment assembly or machine that you need for your operation. Our worldwide 24/7 Field Services network is on the job whenever you need heavy equipment troubleshooting, repairs, rebuilds, relocations, or replacements. And thanks to our specialized Design & Engineering and state-of-the-art

Manufacturing & Repair services, we are a go-to international supplier for improved components and custom assemblies for heavy industrial machinery.



Location: Gillette, WY

Founded: 1964

Principal/CEO: Mike Wandler

Major Customers: Canadian Natural, Kirkland Lake Gold, Navajo Transitional Energy, Imperial Oil, Grupo Mexico, Ellefson Off Highway, Holcim, Mainetec Pty Ltd., Capstone, Asarco LLC

Federal Engagement: DOE

Preferred Point of Contact: Gage Wandler | gwandler@lnh.net | 480-889-2830

Mike Wandler | mwandler@lnh.net | 307-682-7238

<https://www.lnh.net/>

LIGHTBRIDGE CORPORATION



Lightbridge develops next generation fuel technology.



ADVANCED NUCLEAR | SUPPLIER

Location: Reston, VA

Founded: 2006

Principal/CEO: Seth Grae

Major Customers: Non-disclosed

Federal Engagement: DOE, NRC

Preferred Point of Contact: Seth Grae | 571-730-1200

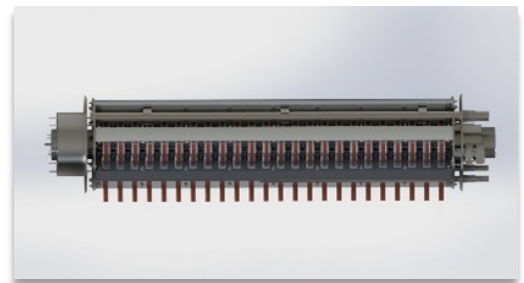
<https://www.ltbridge.com/>

MAIDANA RESEARCH



MAIDANA RESEARCH
Engineering Design and Scientific Research

MAIDANA RESEARCH is a small business dedicated to engineering design and scientific research. Its main set of activities rely on computer aided design, engineering and manufacturing (CAD/CAE/CAM), basic and applied research in the engineering and physical sciences, and consulting in topics related to industries and advanced technologies deemed critical to national security and to long term economic development including, but not limited to, aerospace, satellites, nuclear technologies, defense-related industries, and advanced energy systems.



We provide specialized services in the research, design and development of liquid metal and molten salt electromagnetic pumps for nuclear, space and industrial applications including software development, rapid prototyping, advanced and hybrid manufacturing, test loops, instrumentation and control, and digital monitoring systems for active flow control and machine protection.



- Computer Aided Design (CAD)
- Computer Aided Engineering (CAE)
- Computer Aided Manufacturing (CAM)
- Rapid Prototyping
- Reverse Engineering
- Instrumentation and Control
- Modeling and Simulations
- Multi-Physics Analysis
- Computational Physics
- Software Engineering
- Digital Prototyping

Location: USA (ID) and Thailand

Founded: 2015

Principal/CEO: Dr. Carlos O. Maidana

Major Customers: Non-disclosed

Federal Engagement: DOE, GAIN, NASA, DoD, Other

Preferred Point of Contact: management@maidana-research.com

<https://www.maidana-research.com/>

MATERION



M A T E R I O N

Materion at a Glance:

A global high-tech solutions provider of performance alloys, precision coatings and advanced materials.

- Founded in 1931
- Publicly traded on NYSE since 1972 (MTRN)
- In excess of \$1 billion in sales

Materion services customers in the aerospace, architectural glass, automotive, defense, energy, nuclear, precision optics, and semiconductor electronics markets.



ADVANCED NUCLEAR | SUPPLIER

Location: Mayfield Heights, OH

Founded: 1931

Principal/CEO: Jugal K. Vijayvargiya

Major Customers: Aerospace, Architectural Glass, Automotive Defense, Energy, Nuclear, Precision Optics, and Semiconductor Electronics Markets

Federal Engagement: DOE, ARPA-E, GAIN, NRC

Preferred Point of Contact: Chris Helwig | christopher.helwig@materion.com

Office: 414-212-0239 | Mobile: 414-708-8738

<https://www.materion.com/>

MERIDIAN SERVICES GROUP



ADVANCED NUCLEAR | SUPPLIER

For over 20 years, Meridian (formerly High Bridge Associates and Work Management) has served various industries spanning power generation (nuclear, fossil, and renewables), federal government, T&D, petro-chemical, and Environmental Management. Meridian is an industry leader in SMR, AR, and LLWR planning, analysis, and advisement with expertise encompassing all phases of the project life cycle and beyond to operations and decommissioning, in the US and abroad.

For new nuclear power (NNP) plant facilities, Meridian has been part of owner/licensee/project teams to assist with **screening technology options & life cycle economics** for LLWR, SMR, & Advanced Reactor designs. It utilizes a comprehensive database of cost/schedule/risk historical information and financial modeling tools to assist customers with evaluating the 80-year life-cycle economic performance for licensing, EPC, operations/maintenance, and decommissioning. Meridian has performed strategic advisement and third-party independent reviews of cost, schedules, and risk assessment for various SMRs, ARs, and LWRs.

Meridian is committed to helping owners and contractors to learn from the past and apply these lessons and best practices for success in the future. The Nuclear Energy Institute (NEI) selected Meridian in 2019 to prepare NEI Report 20-08 published in April 2020 documenting strategic project management lessons learned and best practices for first-of-a-kind new nuclear plant construction. Our Meridian website provides links to PDF copies of each of the 32 public domain reference documents and case studies for 10 successful large FOAK projects cited in the NEI Report. In 2022/2023, NEI engaged Meridian to develop several implementation guides based on the 2019 NEI report to support the nuclear industry's needs for formal guidance.



Location: Greensboro, GA

Founded: 2021

Principal/CEO: Jim O'Connor, President | Ken Aupperle, SVP

Major Customers: TVA, Dominion, NuScale, Entergy, Southern, OPG, NEI

Federal Engagement: DOE, DOD, National Labs

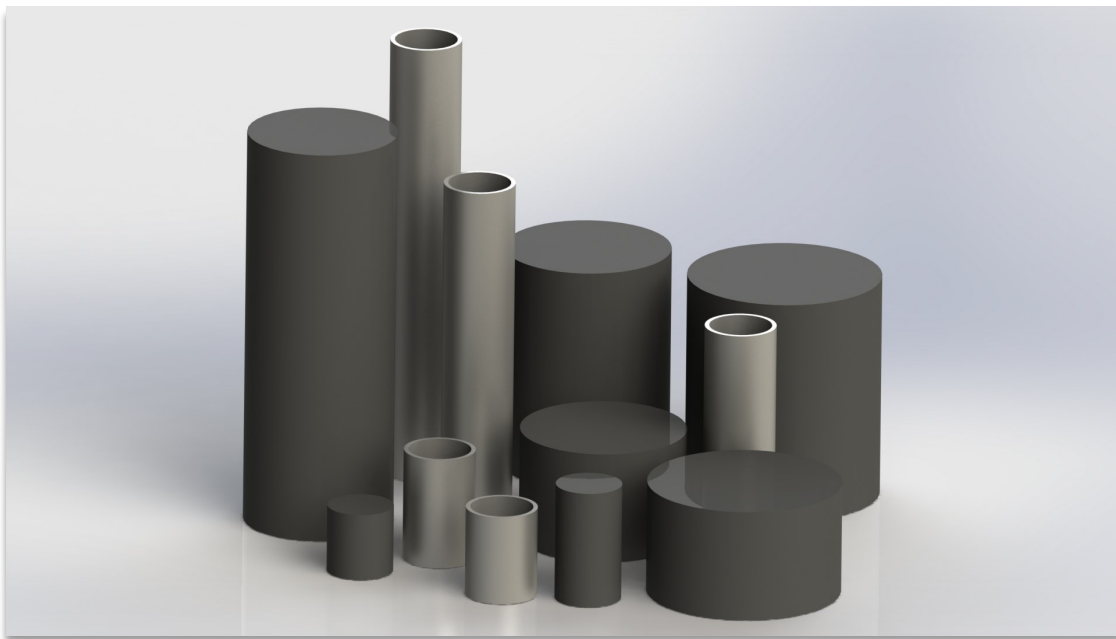
Preferred Point of Contact: Elizabeth Snow | elizabeth.snow@meridian-sg.com | 423-468-4317

<https://meridian-sg.com/>

MILLENNITEK LLC



Millennitek manufactures neutron absorbers from high-temperature materials under our NQA-1 quality program. We also develop materials and have advanced manufacturing methods to accelerate time to market.



ADVANCED NUCLEAR | SUPPLIER

Location: Knoxville, TN

Founded: 2010

Principal/CEO: Steve Getley

Major Customers: Westinghouse, PNNL

Federal Engagement: NASA

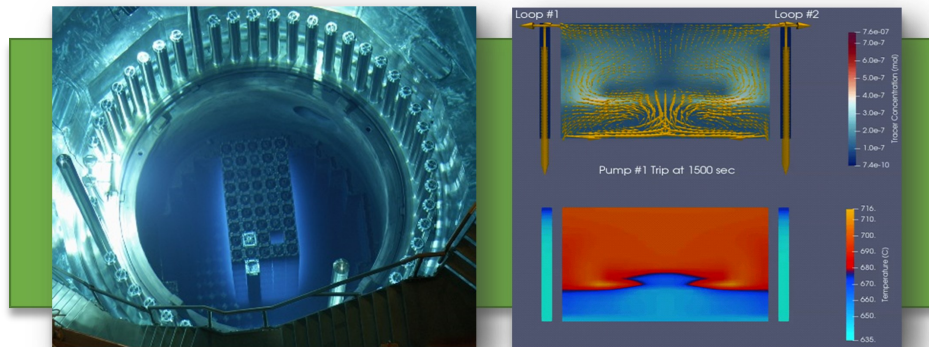
Preferred Point of Contact: Steve Getley | steve.getley@millennitek.com | 865-771-2553

<http://millennitek.com/>

NUMERICAL ADVISORY SOLUTIONS



Numerical Advisory Solutions, LLC (NAS) provides trusted, best-in-class software tools, analysis, engineering, and design services. We are internationally recognized for our expertise in thermal-hydraulic analysis, radiological analysis, safety analysis, licensing methods, quality assurance requirements and engineering software development. Our experience is rooted in design and support of operating nuclear power facilities; however, we support a wide variety of advanced reactor designs, including SMRs, non-LWRs, microreactors, research reactors and medical isotope facilities. NAS is also engaged in hydrogen production, carbon capture and chemical process projects supporting sustainability goals. With a focus on developing innovative, practical and cost-effective solutions to our customer's toughest problems, NAS collaborates with our clients to ensure the safe design and efficient operation of nuclear facilities worldwide. We also leverage advanced modeling and simulation software with cutting-edge technologies, such as AI/ML, to develop and apply tools like Digital Twins and other dynamic decision-making tools to improve efficiency in design, construction, and operations & maintenance. NAS, and predecessors, Zachry Nuclear Engineering, Inc., Proto-Power Corporation, Numerical Applications, Inc., and Computer Simulation & Analysis, Inc., have an established record of providing engineering services and software products to the nuclear industry worldwide for nearly 40 years.



Location: Cary, NC

Founded: 1984

Principal/CEO: James R. Harrell, President

Major Customers: Electric Utilities, advanced reactor designers, research organizations, regulators, architect/engineers, fuel vendors, and government energy agencies

Federal Engagement: DOE, ARPA-E, NRC

Preferred Point of Contact: James R. Harrell | harrelljr@numerical.com | 919-653-7651

<https://www.numerical.com/>

NUTHERM INTERNATIONAL, INC.



ADVANCED NUCLEAR | SUPPLIER

Nutherm is a small business concern serving the DOE and commercial nuclear power industry since 1979. We specialize in the design, manufacture, qualification, and commercial-grade dedication of systems and components for electrical power, control, and instrumentation. Nutherm's in-house lab features electrical performance, accelerated thermal aging, HELB, LOCA, and seismic testing along with numerous specialized testing devices. Nutherm maintains a Quality Assurance Program to support its products and services for safety-class and safety-significant applications. The Nutherm audited Quality Assurance Program meets the requirement of ASME NQA-1, 10 CFR 50 Appendix

B, 10 CFR Part 21, ANSI/ASME Standard N45.2, and DOE Order 414.1D.



Location: Mt. Vernon, IL

Founded: 1976

Principal/CEO: Wade Bowlin

Major Customers: Los Alamos National Laboratory, Oak Ridge National Laboratory, Savannah River Site, Hanford Site

Federal Engagement: DOE, NRC

Preferred Point of Contact: sales@nutherm.com

<https://www.nutherm.com/>

NUVISION ENGINEERING



ADVANCED NUCLEAR | SUPPLIER

NuVision Engineering is an engineering and technology services company specializing in nuclear applications. We provide technically advanced engineering solutions and services for governments and businesses worldwide. We also design and deploy rad-hardened robotic manipulators for use in radioactive environments, and advanced process systems to manage radioactive waste. Our customers include the U.S. and international governments, utility companies, and medical research facilities. Our experienced staff and portfolio enable us to provide solutions to complex problems safely, quickly, and cost effectively. NuVision was founded in 1971 and is headquartered in Pittsburgh, Pennsylvania, with major operational facilities near Charlotte, North Carolina.



Location: Pittsburgh, PA

Founded: 1971

Principal/CEO: Erich Keszler | ekeszler@nuvisioneng.com

Major Customers: U.S. and international governments, utility companies, and medical research facilities

Federal Engagement: DOE, GAIN, ARPA-E, NRC, U.S. and International Governments

Preferred Point of Contact: Martin Williams | williams@nuvisioneng.com

Michael Frankle | mfrankle@nuvisioneng.com

<http://nuvisioneng.com/>

PARAGON ENERGY SOLUTION



The nuclear industry's most trusted supplier

ADVANCED NUCLEAR | SUPPLIER

For over 30 years, Paragon has been supporting the nuclear industry with quality, innovation and an intense focus on customer service. With our ever expanding product and service offerings, Paragon is positioned to serve the rapidly expanding SMR and Advanced Reactor designs with our certified HIPS FPGA based platform digital control systems, neutron flux monitoring systems and all critical equipment needs. This is in addition to our unwavering continued support for the existing commercial nuclear fleet and DOE facilities with our traditional product lines of nuclear industry qualified custom and COTS electrical, mechanical, HVAC and I&C equipment.

Paragon controls the complete project lifecycle, from design and qualification to manufacturing, testing and supply. Our in-house testing and equipment qualification capabilities include Seismic Testing on any of our four (4) seismic tables, Thermal Aging, Cyclic Aging & Testing, EMI / RFI Testing, Loss of Coolant Accident (LOCA) & High Energy Line Break (HELB) Testing, Software Verification & Validation, Cybersecurity, and much more.

Paragon's commitment to our Nuclear Safety Culture allows us to be in lock step with the values of the customers we serve while maintaining the highest levels of



quality. Our Quality Assurance Program includes 10CFR50 Appendix B, 10CFR21, ASME NQA-1, CSA Z299.1-16, ASME Section III, N, NS, NPT and NR Certificates of Authorization, and our programs are audited by NUPIC and NIAC.

Location: Fort Worth, TX

Founded: 1990

Principal/CEO: Doug VanTassell

Major Customers: TVA, Constellation, Southern Co, Entergy, KHNP, OPG, Bruce Power, Bechtel

Federal Engagement: DOE, NRC, DOD

Preferred Point of Contact: John Portillo | jportillo@paragones.com

<https://www.paragones.com>

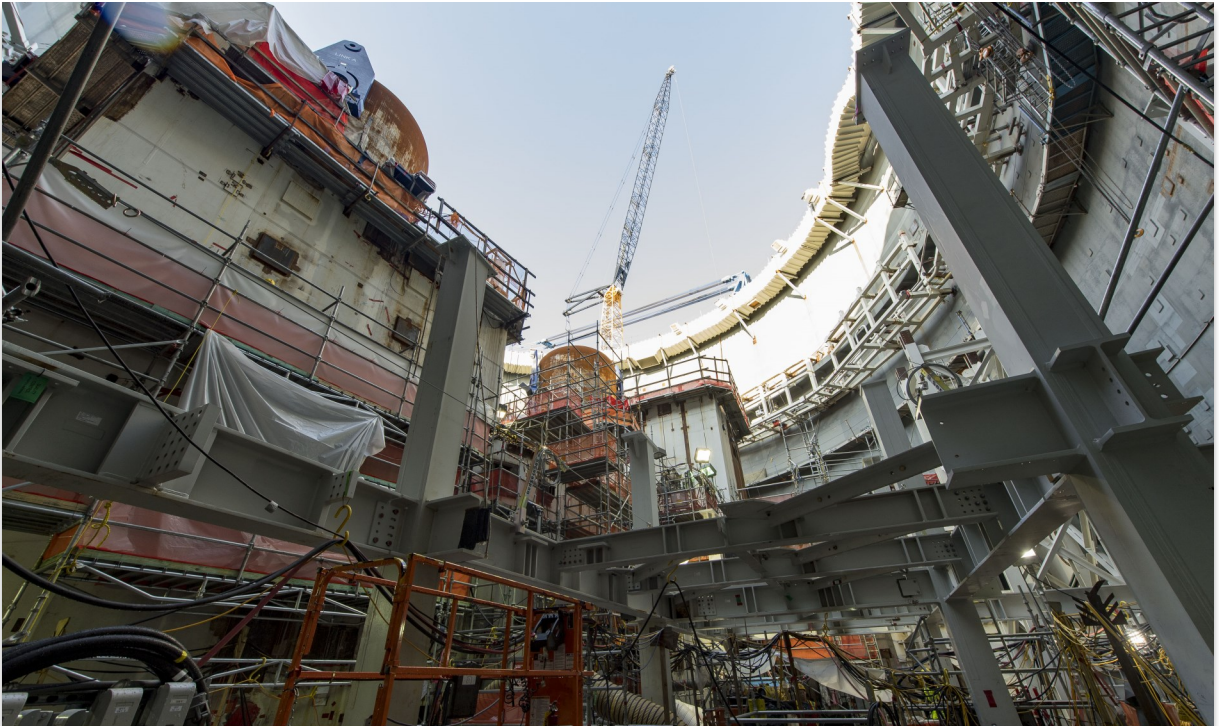
PAXTON & VIERLING STEEL (NQA-1)



A DIVISION OF



We are an NQA-1 structural steel fabrication firm that has successfully completed fabrication of structural steel on commercial nuclear projects as well as DOE nuclear projects.



Maintenance deck inside Vogtle Unit 3 containment vessel. March 2018 ©2018 Georgia Power Company All rights reserved.

Location: Carter Lake, IA

Founded: 1885

Principal/CEO: Tyler Owen

Nuclear Customers:

DOE Nuclear: Hanford WTP/Oak Ridge Y-12 UPF/INL IWTF

Commercial Nuclear: Project Vogtle/Summer/Bechtel/Westinghouse/Fluor/Parsons/CB&I

Commercial Medical: SHINE/Baker

Federal Engagement: DOE, NRC

Preferred Point of Contact: Joe Wishard | jwishard@pvsteel.com | 402-770-8709

<https://owenmetalsgroup.com/industrial-fabrication/>

POWER SYSTEM SENTINEL TECHNOLOGIES, LLC

PSStech

Guarding the Grid

Born out of a need to protect the nuclear industry, PSStech was founded to provide nuclear generating stations with open phase protection. PSStech provides design, manufacturing, and engineering services to the electric power industry and large industrial and commercial customers.



ADVANCED NUCLEAR | SUPPLIER

Location: Warrior, AL

Founded: 2014

Principal/CEO: Greg Franklin

Major Customers: U.S. Nuclear Power Plants, Electric Power Utilities, Large Industrial & Commercial Facilities

Federal Engagement: DOE, GAIN, NRC

Preferred Point of Contact: Chris Melhorn | cmelhorn@psstech.com | 865-456-0602

<https://www.psstech.com/>

PRECISION CUSTOM COMPONENTS, LLC

ADVANCED NUCLEAR | SUPPLIER



PCC has been manufacturing large hydro, fossil, and nuclear power generation equipment in our York, PA location for over 140 years. We have fabricated NSSS vessels and other equipment for the nuclear and process industries including Westinghouse, GE, Framatome, ExxonMobil, Dow DuPont, U.S. Navy, DOE, National Labs, electric utilities, and others. Our nuclear manufacturing history dates back to the industry's origins with Shippingport-1 and continues to this day with SMR, Gen III+ and Gen IV reactor hardware and design support.



Location: York, PA

Founded: 1876

Principal/CEO: Gary Butler

Major Customers: Westinghouse, Framatome, NuScale, BWXT, US Navy, Bechtel, General Dynamics, Northrop Grumman, Dow DuPont, ExxonMobil, US DOE, and National Laboratories

Federal Engagement: DOE, NRC, DOD, NASA

Preferred Point of Contact: Jim Stouch | jstouch@pcc-york.com | 717-434-1802

<https://www.pcc-york.com/>

PREMIER TECHNOLOGY



ADVANCED NUCLEAR | SUPPLIER

Located in Blackfoot, Idaho, just 30 minutes from the Idaho National Laboratory, Premier Technology, Inc. (Premier) is a recognized leader in nuclear fabrication. Premier has supported the nuclear industry for more than two decades, completing over 1,000 projects under nuclear quality assurance programs such as ASME NQA-1 and ASME Section III.

Premier has successfully performed over \$250 million in work under nuclear quality assurance programs in the last decade with single projects as large as \$80M. This includes prototype fabrication, first-of-a-kind builds, and full production runs.



Premier is committed to supporting the development and deployment of advanced reactors. Contact us to discuss your needs for manufacturability reviews and prototyping efforts or to discuss long-term partnerships for manufacturing of reactors.

Location: Blackfoot, ID

Founded: 1996

Principal/CEO: Shelly Sayer

Major Customers: Westinghouse, Areva, Bechtel, NuScale, INL, PNNL, ORNL, SRNL, Others

Federal Engagement: DOE, GAIN, NRC, Other

Preferred Point of Contact: Derek Moss | dmosso@ptius.net | 208-851-0744

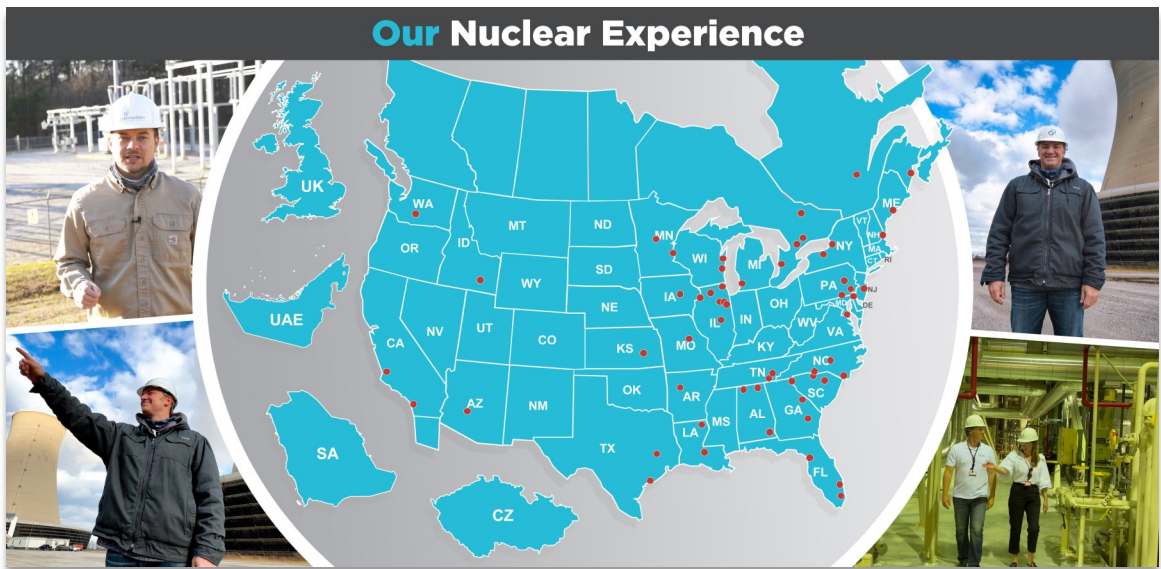
<https://www.ptius.net/>

SCOTTMADDEN



ScottMadden is a Management Consulting firm helping clients in every aspect of energy, including nuclear generation. We help our clients build tailored solutions to improve cost and operational performance. Our deep, practical nuclear experience helps maintain safe, reliable operations and support transformation for a net zero future.

Learn more: <https://bit.ly/3GjKoU3>



Location: Atlanta, GA

Founded: 1983

Principal/CEO: Brad Kitchens

Major Customers: Utilities & Nuclear Power Plants, Research Institutes, Vendors supporting the nuclear community

Federal Engagement: DOE, Idaho National Laboratory, National Labs

Preferred Point of Contact: Ed Baker | EBaker@scottmadden.com | 678-702-8302

<https://www.scottmadden.com/>

SOCOTEC Engineering



ADVANCED NUCLEAR | SUPPLIER

SOCOTEC optimizes the integrity and the sustainability of critical assets within the TIC (Testing, Inspection, Certification) industry in the construction and infrastructure sectors through consulting services, by assembling and coordinating holistic teams of technical experts and advisors to solve our clients' most complex problems, from conception to project execution, throughout the lifecycle of assets, around the globe.

SERVICES FOR THE ASSET LIFECYCLE

- DESIGN**
 - Requirements Definition
 - Design Specifications
 - Conceptual Design
 - Design Review
 - Detail Design
 - Materials Selection
 - Risk Informed Design
 - Code Qualification
 - Drawings/Document Development
- CONSTRUCTION**
 - Procurement Assistance
 - Vendor / Contractor Selection
 - Construction Support
 - Permitting Assistance
 - Commissioning
 - Special Inspections
 - Quality Design
 - Acceptance Testing
 - Documentation
 - Training
- OPERATION**
 - Maintenance Support
 - Structural / Mechanical Monitoring
 - Process / Product Improvement
 - Financial Modeling
 - Inspections / Walkdowns
 - Aging Management
 - Risk Assessment
 - Failure Analysis
 - NDE / NDT
 - Training for Service
- AGING / END OF LIFE**
 - Life Cycle Management
 - Strategic Asset Planning
 - Life Extension / Rejuvenation
 - End-of-Life Planning
 - Decommissioning / Retirement
 - Replacement Specification

Materials Laboratory and Large-Scale Testing Facility

SOCOTEC's fully accredited Materials Laboratory and Large-Scale Testing Facility, located in Brooklyn provides value-added services to our efforts. The original laboratory was founded in the late 1800's as a materials consultant to the growing industrial base in the New York City area. Over a century later, the materials science and engineering expertise remains the foundation upon which all of our services are built.

We offer round-the-clock support during emergencies, with a staff of technicians, engineers and scientists backed by SOCOTEC's worldwide industry experience. We work closely with our clients to provide timely answers to complex problems.

Digital Inspection Toolkit

SOCOTEC has developed the Wise-Back digital inspection toolkit to increase speed, safety and accuracy of work performed in the field in a variety of industries.

Wise-Back offers a unique approach to data inspection organization that's cloud-based, automated and mobile-friendly. The toolkit promotes fast, safe, more focused fieldwork inspections and walkdowns. It enables users to cover more ground with each excursion by offering a total hands-free experience, from data gathering to final report generation.

Hardware Platform Built for the Field

SOCOTEC's Wise-Back toolkit offers a suite of tools for engineering testing, inspection and certification (ETIC). Wise-Back offers a streamlined, customized approach to field data collection that runs across multiple devices. Among the wide variety of integrated tools are a headset computer, tablet, cameras and video, sensors and measuring devices.

130 Years of Service to Industry

In 1885, Dr. Lucius Pitkin established an independent testing laboratory in New York City to meet the needs of America's rapidly growing industrial base. The eponymous firm that he founded performed chemical assays for a variety of industries. By the 1950s, the group added a metallurgical laboratory and failure analysis to its offerings. This has grown further to include stress analysis, fracture mechanics, and engineering programs, creating a full-service engineering firm with an outstanding global reputation for engineering excellence and cost-effective problem solving.

Well into its second century of service, the Specialty Engineering Group—now a part of SOCOTEC USA—has expanded from its New York base to offices in Boston, Richland, and Sydney, Australia. The original materials testing laboratory in Manhattan was relocated to Brooklyn, augmented by a large-scale testing facility. In addition, a laboratory annex is maintained at our Amesbury, Massachusetts office with the capabilities to evaluate low level radioactive materials. The group serves industries whose very existence could scarcely be imagined by its founder. We—Dr. Pitkin's successors—remain in the forefront of development of new analytical techniques, tools and instrumentation but our motto, "Building trust for a safer, sustainable world" remains true to his original vision.

 **SOCOTEC US Headquarters**
151 West 42nd Street, New York, NY 10036
Tel: +1(212) 689-5389

Location: New York, NY

Founded: 1885

Principal/CEO: Robert Vecchio, CEO

Major Customers: INL, ANL, Entergy, EPRI, Duke, Holtec, Con Edison, PASNY, Vicinity, PANYNJ

Federal Engagement: DOE

Preferred Point of Contact: Mr. Sontra Yim | sontra.yim@socotec.us | 603-686-9676

<https://www.socotec.us/>

SOUTHERN NUCLEAR DEVELOPMENT, LLC

ADVANCED NUCLEAR | SUPPLIER



Southern Nuclear Development, a subsidiary of Southern Nuclear Operating Company, pursues partnerships across the industry to drive the success of advanced nuclear technologies to be deployed as we move toward low- to no- carbon operations by 2050 — benefiting Southern Company customers for years to come. Southern Nuclear Development leverages decades of experience and research in nuclear operations, engineering, licensing and development to help advanced nuclear developers execute each phase of their strategy, from concept to commercial operation.



Location: Birmingham, AL

Founded: Non-disclosed

Principal/CEO: Stephen E. Kuczynski

Major Customers: Non-disclosed

Federal Engagement: DOE, NRC, EPA, FEMA

Preferred Point of Contact: Ben Carmichael / bmcarmic@southernco.com / 205-992-5944

<https://www.southernnuclear.com/>

SOUTHWEST RESEARCH INSTITUTE



SOUTHWEST RESEARCH INSTITUTE

ADVANCED NUCLEAR | SUPPLIER

SwRI is an independent, nonprofit, and multidisciplinary applied research and development organization. We are R&D problem solvers providing independent, premier services to government and industry clients. We work in the public's best interest and toward the betterment of humanity.

SwRI supports the commercial nuclear industry, and federal, state, and regional research and regulatory efforts across a broad spectrum of engineering and science areas.

- Performs multi-level material assessments for the nuclear industry, ranging from quick turn-around metallurgical and electronic failure analyses and mechanical testing programs to comprehensive studies which couple mechanical and material testing with computational modeling and risk assessments.
- High pressure and high temperature testing facilities are available to simulate the environmental conditions found in nuclear power plant. This includes a recirculating flow loop that replicates BWR and PWR primary water systems.
- Fire testing and modeling facilities support in-plant fire hazards, as well as performance of radioactive material storage and transportation packages.
- Provides technical evaluations in support of the licensing, inspection, and maintenance of facilities used across the nuclear fuel cycle. These evaluations are conducted by staff in the Center for Nuclear Waste Regulatory Analyses, a federally funded research and development center established in 1987 by the U.S. Nuclear Regulatory Commission (NRC), with augmentation across SwRI.
- Conducts multi-hazard risk assessments using deterministic and probabilistic methodologies to evaluate earthquake, flooding, tornado, tsunami, volcano, and other natural hazards. SwRI staff also have extensive experience in the Senior Seismic Hazard Analysis Committee (SSHAC) process (NRC NUREG-2213).
- Offers a team of mechanical engineering experts who focus on nondestructive evaluation of nuclear reactors in compliance with federal and international regulations, as well as engineers and scientists who specialize in failure analysis of electrical, hydraulic, and mechanical components.
- Extensive laboratories for environmental chemistry and radiochemistry investigations, including a wide range of chemical and radioactive contaminants.
- On-campus hot laboratory is available to evaluate radiologically contaminated parts and irradiate parts and components to assess their performance, all under an Institute Quality Plan that is 10 CFR Part 50 Appendix B compliant. This facility supports our extensive work for the U.S. Department of Energy (DOE) under the Off-site Source Recovery Program.
- Prepares and reviews environmental reports, environmental impact statements and other documents in support of National Environmental Policy Act (NEPA) evaluations for nuclear site. This work includes extensive public outreach and engagement.

Location: San Antonio, TX

Founded: 1947

Principal/CEO: Adam L. Hamilton, P.E., President and CEO

Major Customers: Non-disclosed

Federal Engagement: DOE, ARPA-E, NRC, DOD, DHS, DOI, DOT, NASA, EPA, Other

Preferred Point of Contact: Business Inquires Office | ask@swri.org | 210-522-2122

<https://www.swri.org>

STRUCTURAL INTEGRITY ASSOCIATES, INC.

ADVANCED NUCLEAR | SUPPLIER



Structural Integrity Associates is a specialty engineering company serving the nuclear industry since 1989. Our talent and technology encompass monitoring & inspection capabilities, advanced analytical methods, and material assessment strategies to provide clients with expert asset integrity solutions and effective regulatory programs. Unique to our structural integrity capabilities are nuclear fuel engineer and structural analysis experts, and the most advanced fuel performance code in the nuclear industry.

Some of the services we provide include:

Engineering Analysis

- Perform stress, fracture mechanics, residual stress, dynamic/non-linear, computational fluid dynamics, and other advanced analyses using proprietary FEA tools and methods (ex. applied probabilistic fracture mechanics).
- Development of industry codes and standards including ASME, ASTM, ASNT, API, and others.
- Perform work under the auspices of documented and routinely audited Quality Assurance programs including NQA-1.

Materials Evaluations & Testing

- The latest field and laboratory testing technologies to identify causes of material degradation and damage.

Inspection & Monitoring

- Conduct Non-Destructive Examination (NDE) using state-of-the-art linear and annular phased array UT, TOFD,



Guided Wave, and Many Other Advanced NDE Technologies

- Develop and implement tooling customized to applications when needed.
- Apply technicians certified in accordance with ASNT and other standards' requirements.

SI maintains offices throughout the U.S.

Location: Charlotte, NC

Founded: 1989

Principal/CEO: Mark Marano, CEO | Tony Robinson, CNO

Major Customers: All major power generating utilities throughout North America. SI supports asset management programs for Nuclear, Fossil, and Renewable energy-producing power plants.

Federal Engagement: DOE

Preferred Point of Contact: Sean M. Fuller | sfuller@structint.com | 704-280-2564

<https://www.structint.com/>

STUDSVIK SCANDPOWER

Studsvik

Studsvik Scandpower provides nuclear simulation software and services which manage fuel from arrival on site to departure in casks. Key software products include CASMO/SIMULATE, GARDEL, S3K, S3R, MARLA, SNF, and CASKLOAD.



ADVANCED NUCLEAR | SUPPLIER

Location: Global

Founded: Non-disclosed

Principal/CEO: Steve Freel

Major Customers: Non-disclosed

Federal Engagement: DOE, GAIN, ARPA-E, NRC, Other

Preferred Point of Contact: Art Wharton | art.wharton@studsvik.com

<https://www.studsvik.com/>

TAURUS teleSYS INC.



Taurus teleSYS, an Original Equipment Manufacturing (OEM) has implemented a Test Apparatus (TA) for hardware in the loop integrated testing and in emulation of a microgrid electrical transmission distribution and industrial data acquisition and control application.



Location: Newport News, VA

Founded: 1980

Principal/CEO: Arvind Patel

Major Customers: Newport News Shipbuilding, a HII subsidiary, Naval Nuclear Laboratory

Federal Engagement: DOE, Other

Preferred Point of Contact: Arvind Patel | apatel@tgate.com | 757-873-2700

TETRA TECH



TETRA TECH

ADVANCED NUCLEAR | SUPPLIER

Tetra Tech is a science, engineering, and construction firm that offers integrated services from front-end environmental science and planning through design, engineering, construction management, operations, and maintenance, of nuclear power plant systems. We currently employ SMEs from a variety of disciplines with full breadth knowledge of: reactor, safety, and balance of plant systems; nuclear quality assurance; operations (SRO); environmental assessment and permitting; and radioactive waste management.



Location: Pasadena, CA

Founded: 1966

Principal/CEO: Dan Batrack

Major Customers: Federal Aviation Admin., Nat'l Oceanic & Atmospheric Admin., US Agency for Int'l Development, US DOD (Air Force, Army, Navy, Army Corps of Engineers, coast Guard), Dept. of Energy, Dept. of State, EPA, US Forest Service TerraPower, Exelon, Dominion, Southern Nuclear Co., Progress Energy, DTE Energy

Federal Engagement: DOE, ARPA-E, NRC, Other

Preferred Point of Contact: John Gonsky, Vice President, DOE and Nuclear Programs

John.gonsky@tetrattech.com | 509-372-5814

<https://www.tetrattech.com>

THERMAL ENGINEERING INTERNATIONAL (USA) INC. (TEi)



TEi
a Babcock Power Inc. company

Thermal Engineering International — (TEi - a Babcock Power Inc. company) — has installations across the globe and more than 65 years of experience in the design and manufacture of high quality heat transfer equipment for the nuclear industry. TEi is the industry-leader in moisture-separator reheaters, feedwater heaters and condensers, providing domestic fabrication and services from our Joplin, MO fabrication facility and a team of highly-experienced heat exchanger subject matter experts at our Cerritos, CA headquarters. TEi holds ISO-9001, ASME I, VIII, and B31.1

qualifications and maintains a 10CFR50 App. B Quality Program. TEi is unique in its experience with molten salt heat exchangers that can be brought to bear for advanced reactor and/or energy storage projects.



Location: Cerritos, CA

Founded: 1956

Principal/CEO: Ken Murakoshi

Major Customers: US Nuclear Utilities, EPC Firms, US Navy Fleet, and Developers of Advanced Reactors

Federal Engagement: DOE, GAIN

Preferred Point of Contact: Joseph Green, PhD, PE, Chief Nuclear Officer

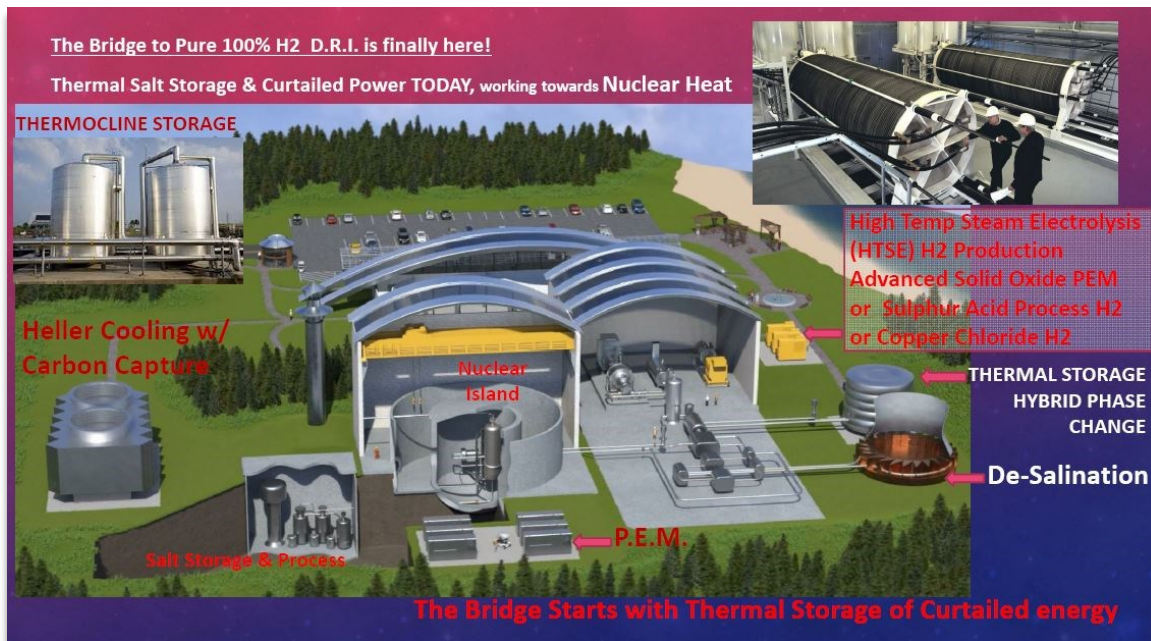
josephgreen@babcockpower.com | 508-562-0894 | +44 07780447880

<https://www.babcockpower.com/tei/>

THORIUM ENERGY ALLIANCE



Thorium Energy Alliance has been an international leader in promoting and advising on the use of Thorium in Fuels and Advanced Materials. TEA has helped set USA policy and has assisted public, private and university research efforts for over 15 years. TEA is a 501(c)3 Educational Advocacy organization.



ADVANCED NUCLEAR | SUPPLIER

Location: Harvard, IL

Founded: 2006

Principal/CEO: John Kutsch

Major Customers: Clients and membership are confidential. If a company or organization wishes to engage us, we can sign an NDA and discuss your needs.

Federal Engagement: DOE

Preferred Point of Contact: John Kutsch | director@thoriumenergyalliance.com | 312-303-5019

<https://thoriumenergyalliance.com/>

TIOGA



Tioga Nuclear® knows what it takes to supply critical components to the nuclear power industry. Founded on hard work and customer focus, Tioga has been delivering on expectations for more than 75 years

Tioga has continuously maintained our ASME Nuclear Certificate and QSC Material Organization status since 1982. Together, our personnel have more than 150 years of cumulative nuclear experience ranging from quality assurance to production.

Whether you need to procure unusual or difficult to find materials, meet special packaging and shipping standards or implement unique quality assurance requirements, Tioga Nuclear® has the experience and know-how to supply your needs. Whether you require pipe or plate, forgings or structural shapes, Tioga is the source for nuclear supply.

Combined with our unparalleled inventory of special metals, dedicated project management and global sourcing network, you can count on us to deliver the materials you need on-spec and on-schedule, with proper documentation.

We have been audited by NUPIC and NIAC and meet the requirements of ASME Section III, 10CFR50 Appendix B, N45.2, NQA-1, CAN3-N299 SERIES, & MIL-I-45208A.

Founded in 1964 and headquartered in Gillette, Wyoming, USA, L&H Industrial is a leader in technology innovations, custom manufacturing, and comprehensive services for heavy industrial machinery used in mining, oil and gas, railways, and other industries. Today, in our third generation as a family business, we have offices and distribution partners around the world and hundreds of employees dedicated to delivering outstanding service and innovations for the biggest and hardest-working machines on the planet.

We can custom-engineer and build, from the ground up, any heavy equipment assembly or machine that you need for your operation. Our worldwide 24/7 Field Services network is on the job whenever you need heavy equipment troubleshooting, repairs, rebuilds, relocations, or replacements. And thanks to our specialized Design & Engineering and state-of-the-art Manufacturing & Repair services, we are a go-to international supplier for improved components and custom assemblies for heavy industrial machinery.



Location: Philadelphia, PA

Founded: 1946

Principal/CEO: Bill Kotcher, President

Major Customers: Nuclear Utilities, DOE, National Labs, US Navy, Fabricators & OEMs

Federal Engagement: DOE

Preferred Point of Contact: Tim Bollinger, Bus. Development | tbollinger@tiogapipe.com | 803-792-5765

<https://www.tiogapipe.com/>

ULTRA ENERGY

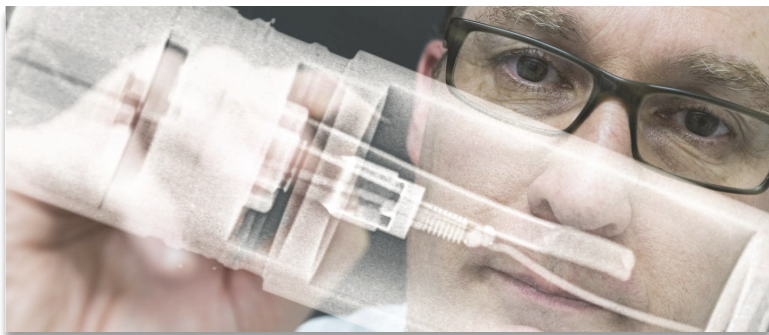


ADVANCED NUCLEAR | SUPPLIER

Ultra Energy provides customers with solutions that give complete, long-term protection and control of reactor protection systems, while assisting them to increase the value derived from their investments over the lifetime of their asset. Ultra Energy offers a defense-in-depth approach to the nuclear industry focusing on systems requiring formal safety justification or qualification.

Our customers are developing small modular reactors, advanced reactors, constructing new reactors, extending the life of existing reactors and managing the lifecycle of radioactive material.

Ultra Energy has worked with nuclear and industrial customers for over 60 years. We are embedded in the national infrastructure, supporting long-term continuous operation of facilities with protection and control solutions that monitor and control temperature, pressure, radiation, and neutrons. In North America Ultra Energy has a role in maintaining the safety of ~80% of all US nuclear power plants as well as commercial and military nuclear facilities in operation across the globe.



Ultra Energy collaborates with partners in aviation, space, and industrial manufacturing.

Location: Worldwide

Founded: 1993

Principal/CEO: Ognjen Starovic, President

Major Customers: Non-disclosed

Federal Engagement: DOE, DOD, DHS, NRC

Preferred Point of Contact: Mark McCray | mark.mccray@ultra-nspi.com

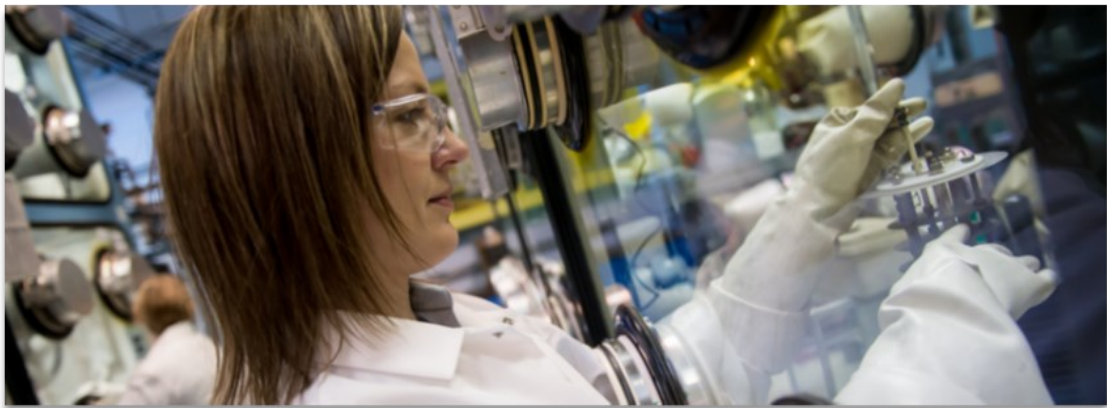
<https://www.ultra.group/>

NATIONAL LABORATORIES

ARGONNE NATIONAL LABORATORY



Argonne National Laboratory is a multidisciplinary science and engineering research center, where scientists and engineers work together to answer the biggest questions facing humanity, from how to obtain affordable clean energy to protecting ourselves and our environment. Argonne was born out of the University of Chicago's work on the Manhattan Project in the 1940s. Ever since that time, the Laboratory's goal has been to make an impact- from the atomic to the human to the global scale. Argonne pioneered the application of nuclear fission for energy generation and maintains leading-edge experimental and computational capabilities for developing innovative reactor and fuel cycle systems.



Location: Lemont, IL

Founded: 1946

Principal/CEO: Paul K. Kearns (Director)

Federal Engagement: DOE-SC, DOE-NE, NNSA, DOE-EERE, NRC, ARPA-E, DOD, DHS

Preferred Point of Contact: Hussein S. Khalil | hkhalil@anl.gov | 630-252-7266

www.anl.gov

BROOKHAVEN NATIONAL LABORATORY



Brookhaven National Laboratory conducts research and development related to nuclear technologies (reactors and accelerator-driven systems), advanced materials for nuclear applications, proliferation resistance and physical protection, reliability and risk assessment, and advanced modeling techniques for reactor simulation and energy systems.



ADVANCED NUCLEAR | NATIONAL LABORATORY

Location: Upton, NY

Founded: 1947

Principal/CEO: Doon Gibbs

Federal Engagement: DOE, GAIN, ARPA-E, NRC, Other

Preferred Point of Contact: Alejandro Sonzogni | sonzogni@bnl.gov

www.bnl.gov

IDAHO NATIONAL LABORATORY



ADVANCED NUCLEAR | NATIONAL LABORATORY

Idaho National Laboratory (INL) is the nation's lead laboratory for nuclear energy research, development, demonstration, and deployment. INL's nuclear energy researchers work in a broad range of technical areas including:

- Unparalleled irradiation and post-irradiation examination
- Fuel fabrication and materials testing facilities
- High-performance computing
- Integrated energy systems
- The nuclear fuel cycle

INL also leads many of the DOE's Office of Nuclear Energy initiatives and programs that connect its unique nuclear energy R&D capabilities with stakeholders. This includes the Gateway for Accelerated Innovation in Nuclear (GAIN), the National Reactor Innovation Center (NRIC), the Light Water Reactor Sustainability (LWRS) program and the Nuclear Science User Facilities (NSUF).



Location: Idaho Falls, ID

Founded: 1949

Principal/CEO: John Wagner

Federal Engagement: DOE, GAIN, ARPA-E, NSUF, NEUP, NRC

Preferred Point of Contact: Jess Gehin | jess.gehin@inl.gov | 208-526-3486;

www.inl.gov

LAWRENCE BERKELEY NATIONAL LABORATORY



Lawrence Berkeley National Laboratory specialized in science and technology development for energy applications.



ADVANCED NUCLEAR | NATIONAL LABORATORY

Location: Berkeley, CA

Founded: 1931

Principal/CEO: Michael Witherell

Federal Engagement: DOE, GAIN, ARPA-E, NRC, Other

Preferred Point of Contact: Peter Hosemann | peterh@berkeley.edu | 510-717-5752

www.lbl.gov

LAWRENCE LIVERMORE NATIONAL LABORATORY



For more than 60 years, the Lawrence Livermore National Laboratory (LLNL) has applied science and technology to make the world a safer place.

Livermore’s defining responsibility is ensuring the safety, security and reliability of the nation’s nuclear deterrent. Yet LLNL’s mission is broader than stockpile stewardship, as dangers ranging from nuclear proliferation and terrorism to energy shortages and climate change threaten national security and global stability. The Laboratory’s science and engineering are being applied to achieve breakthroughs for counterterrorism and nonproliferation, defense and intelligence, energy and environmental security.



Location: Livermore, CA

Founded: 1952

Principal/CEO: Bill Goldstein

Federal Engagement: DOE, NRC, ARPA-E, GAIN, NNSA, DHS, Other

Preferred Point of Contact: Kiel Holliday | holliday7@llnl.gov | 925-422-4074

www.llnl.gov

LOS ALAMOS NATIONAL LABORATORY



ADVANCED NUCLEAR | NATIONAL LABORATORY

Los Alamos National Laboratory's mission is to solve national security challenges through scientific excellence. The Laboratory conducts fundamental nuclear materials research for future nuclear reactor designs and fuel cycle options, develops detection technologies needed for global nuclear materials management and supports nuclear energy initiatives through advanced modeling and simulation.

This work includes:

- Fundamental advances in nuclear fuels and cladding materials
- Nonproliferation safeguards
- Reactor concepts
- Reactor waste disposition



Location: Los Alamos, NM

Founded: 1943

Principal/CEO: Terry Wallace

Federal Engagement: DOE, GAIN, NRC, ARPA-E

Preferred Point of Contact: DV Rao | dvrao@lanl.gov | 505-667-5098

www.lanl.gov

OAK RIDGE NATIONAL LABORATORY



Oak Ridge National Laboratory (ORNL) is the U.S. Department of Energy's largest science and energy laboratory with signature strengths in computing, materials, neutron science, and nuclear science and technology. ORNL provides science and technology capabilities and services to extend the life of our existing light water reactor fleet, create and develop concepts for advanced reactor technologies, develop advanced nuclear fuels and fuel cycles, and support modernization of the U.S. nuclear regulatory infrastructure.



Location: Oak Ridge, TN

Founded: 1943

Principal/CEO: Thomas Zacharia

Federal Engagement: DOE, GAIN, ARPA-E, NRC, Other

Preferred Point of Contact: Kenneth Tobin | tobinkwjr@ornl.gov | 865-574-5267

Andrew Worrall | worralla@ornl.gov | 865-576-9369

www.ornl.gov

PACIFIC NORTHWEST NATIONAL LABORATORY



Pacific Northwest National Laboratory (PNNL) conducts research and development across the nuclear fuel cycle to support DOE and industry in development of advanced materials, advanced fuels and Gen IV reactors for the next generation of nuclear energy. Drawing on decades of expertise in nuclear science, engineering and regulation, along with its Category 2 Nuclear Facility assets, PNNL supports technology development across the TRL spectrum.



ADVANCED NUCLEAR | NATIONAL LABORATORY

Location: Richland, WA

Founded: 1965

Principal/CEO: Steven Ashby

Federal Engagement: DOE, GAIN, NRC, ARPA-E, NNSA, DHS

Preferred Point of Contact: Mark Nutt | mark.nutt@pnnl.gov | 509-375-2984

nuclearenergy.pnnl.gov

SANDIA NATIONAL LABORATORIES



Sandia National Laboratories

A Federally Funded Research and Development Center for the National Nuclear Security Administration with a strong science, technology and engineering foundation enables Sandia's mission to develop advanced technologies to ensure global peace through a capable research staff working at the forefront of innovation, collaborative research with universities and companies and discretionary research projects with significant potential impact. Sandia National Laboratories' unique mission responsibilities in the nuclear weapons program create a foundation from which they leverage capabilities, enabling them to solve complex national security problems.



Location: Albuquerque, NM

Founded: 1949

Principal/CEO: Steven Younger

Federal Engagement: DOE, GAIN, ARPA-E, NRC, Other

Preferred Point of Contact: Richard Griffith | rogrif@sandia.gov | 505-844-8232;

Patrick Mattie | pdmatti@sandia.gov | 505-284-4796

www.sandia.gov

SAVANNAH RIVER NATIONAL LABORATORY



Savannah River National Laboratory (SRNL) has core competencies in nuclear materials management and advanced materials design, manufacture, characterization and testing. SRNL has many unique laboratory facilities enabling the safe study and handling of nuclear materials and nuclear fuel as well as ultra-sensitive measurement and analysis of radioactive materials.



ADVANCED NUCLEAR | NATIONAL LABORATORY

Location: Aiken, SC

Founded: 1951

Principal/CEO: Vahid Majidi

Federal Engagement: DOE, GAIN, ARPA-E, NRC

Preferred Point of Contact: Thad Adams / thad.adams@srnl.doe.gov / 803-725-5510

srnl.doe.gov

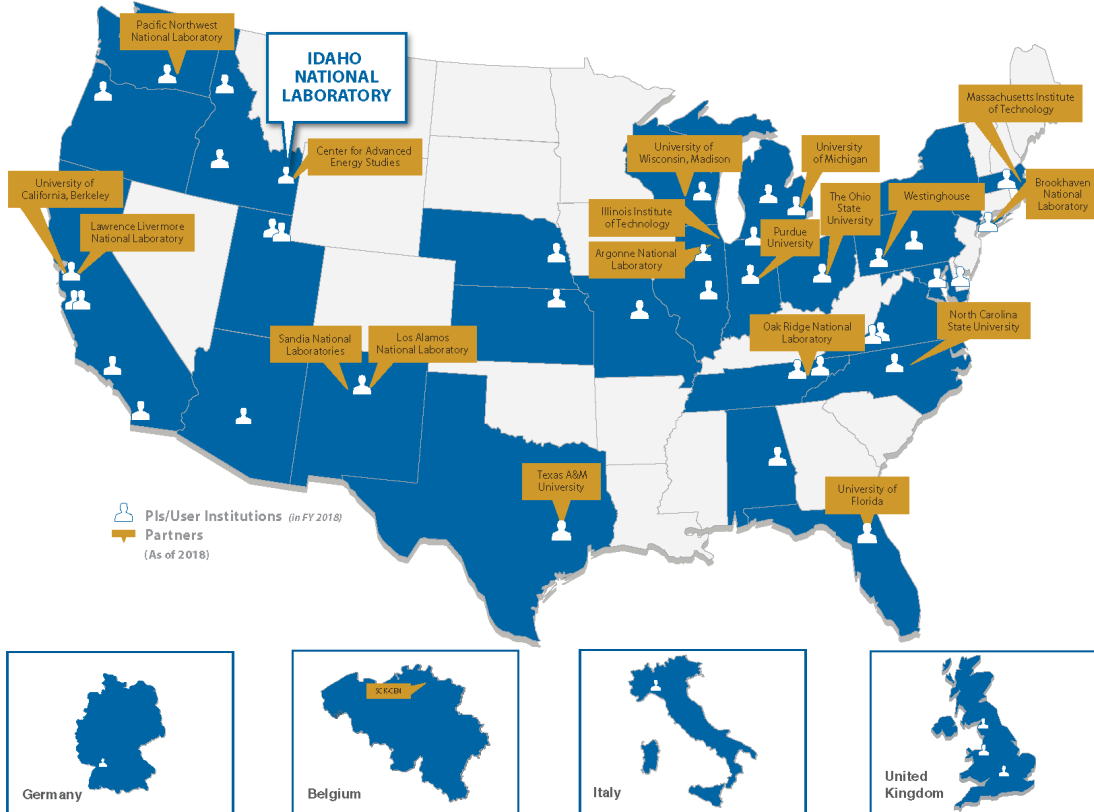
RESOURCES

NUCLEAR SCIENCE USER FACILITIES



The Nuclear Science User Facilities (NSUF) offers unparalleled research opportunities for nuclear energy researchers. Users are provided access (at no cost to the researcher) to world-class nuclear research facilities, technical expertise from experienced scientists and engineers, and assistance with experiment design, assembly, safety analysis and examination.

Access to NSUF's 49 facilities at 21 partner institutions is awarded through two competitive peer-reviewed processes, Consolidated Innovative Nuclear Research (CINR) and the Rapid Turnaround Experiment (RTE). NSUF staff is available to help any researcher who desires to submit a proposal. Submitted proposals should be consistent with the DOE-NE mission and its programmatic interests. These include light water reactor sustainability, fuel cycle research and development, advanced modeling and simulation, and advanced reactor technology programs. All NSUF research must be non-proprietary and results are expected to be published.



Location: Idaho Falls, ID **NSUF Director:** Rory Kennedy
Preferred Point of Contact: Tiera Cate / tiera.cate@inl.gov / 208-403-8844

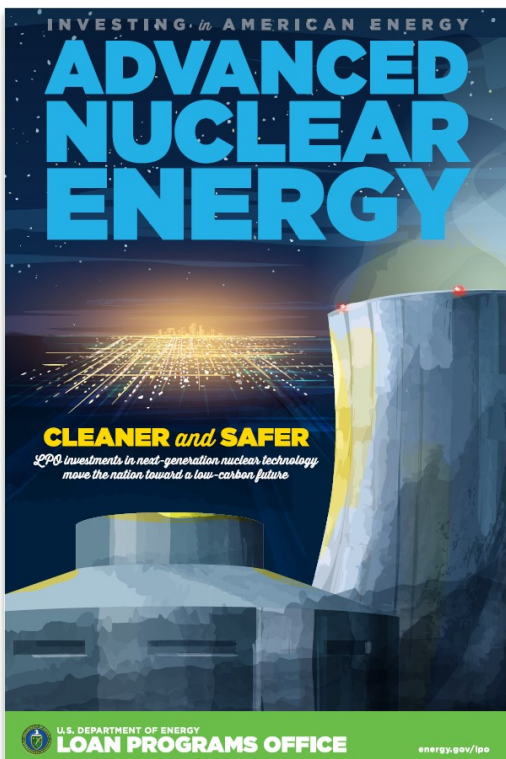
www.nsf.inl.gov

U.S. DEPARTMENT OF ENERGY LOAN PROGRAMS OFFICE



The Department of Energy's Loan Programs Office (LPO) finances large-scale, all-of-the-above energy infrastructure projects in the United States. LPO's in-house team has decades of financial technical, legal, and environmental experience and works closely with industry to bridge gaps in the commercial debt market when innovative technologies or unfamiliar borrowers may not be well understood by the private sector.

With more than \$40 billion of loans and loan guarantees available, LPO can provide access to debt not typically available in the commercial sector. To



date, LPO has approved more than \$30 billion of loans and loan guarantees for more than 30 projects and has \$12.5 billion of available loan guarantees under its Advanced Nuclear Energy Projects Solicitation. LPO has a proven track record that includes transforming existing energy infrastructure, reviving nuclear construction, accelerating growth of utility-scale solar and wind, expanding domestic manufacturing of electric vehicles, and improving the lives of all Americans by catalyzing new energy technology and creating jobs.

Location: Washington, DC

Preferred Point of Contact: lgprogram@hq.doe.gov / 202-586-8336

www.energy.gov/lpo

ACRONYM LIST

| | |
|----------|---|
| A&E | Architecture & Engineering |
| AISC | American Institute of Steel Construction |
| ANL | Argonne National Laboratory |
| ANSI | American National Standards Institute |
| APA | Accident Precursor Analysis |
| API | American Petroleum Institute |
| AR | Advanced Reactor |
| ARIS | Advanced Reactor Information System |
| ARPA-E | Advanced Research Projects Agency – Energy |
| ART | Advanced Reactor Technology |
| ASME | American Society of Mechanical Engineers |
| ASMR | Advanced Small Modular Reactor |
| ASNT | American Society of Nondestructive Testing |
| ASTM | American Society for Testing and Materials |
| AWS | American Welding Society |
| BNL | Brookhaven National Laboratory |
| BWR | Boiling Water Reactor |
| CAD | Computer-Aided Design |
| CAE | Computer-Aided Engineering |
| CAM | Computer-Aided Manufacturing |
| CANDU | Canada Deuterium Uranium |
| CANM | Center for Advanced Nuclear Manufacturing |
| CCW | Component Cooling Water |
| CECR | Controlled Electron Capture Reaction |
| CFR | Code of Federal Regulations |
| CINR | Consolidated Innovative Nuclear Research |
| COLA | Construction and Operating License Application |
| CRM | Continuous Risk Management |
| CTD | Composite Test Device |
| DARPA | Defense Advanced Research Projects Agency |
| DHS | Department of Homeland Security |
| DOD | Department of Defense |
| DOE | Department of Energy |
| DOE-EERE | Department of Energy-Office of Energy Efficiency and Renewable Energy |

ACRONYM LIST (Cont.)

| | |
|-----------------|---|
| DOE-NE | Department of Energy-Nuclear Energy |
| DOE-SC | Department of Energy-Office of Science |
| DOJ | Department of Justice |
| DOT | Department of Transportation |
| EBR-II | Experimental Breeder Reactor II |
| EDG | Emergency Diesel Generator |
| EM ² | Energy Multiplier Module |
| EPA | Environmental Protection Agency |
| EPC | Engineering, Procurement, and Construction |
| EPFC | Engineering, Procurement, Fabrication, Construction |
| EPRI | Electric Power Research Institute |
| ERM | Enterprise Risk Management |
| ESBWR | Economic Simplified Boiling Water Reactor |
| FATE | Flow, Aerosol, Thermal, and Explosion |
| FEA | Finite Element Analysis |
| FEMA | Federal Energy Management Agency |
| FHR | Fluoride Salt-Cooled High-Temperature Reactor |
| FMR | Fast Modular Reactor |
| FPGA | Field-Programmable Gate Array |
| FRs | Fast Reactors |
| GAIN | Gateway for Accelerated Innovation in Nuclear |
| GCR | Gas Cooled Reactor |
| GEN III | Generation III |
| GEN IV | Generation IV |
| GFR | Gas-Cooled Fast Reactor |
| GWe | Gigawatt Electric |
| GWhe | Gigawatt Hour Electric |
| HEI | Heat Exchange Institute |
| HELB | High Energy Line Break |
| HTGR | High-Temperature Gas Reactor |
| HTRs | High Temperature Reactors |
| I&C | Instrumentation and Control |
| IAEA | International Atomic Energy Agency |
| IES | Integrated Energy Storage |

ACRONYM LIST (Cont.)

RESOURCES

| | |
|---------------|---|
| IMSR | Integral Molten Salt Reactor |
| INL | Idaho National Laboratory |
| IR | Infrared |
| ISO | International Organization for Standardization |
| kW | Kilowatt |
| LANL | Los Alamos National Laboratory |
| LBNL | Lawrence Berkeley National Laboratory |
| LENR | Low Energy Nuclear Reaction |
| LFR | Lead-Cooled Fast Reactor |
| LFTR | Liquid-Fluoride Thorium Reactor |
| LLNL | Lawrence Livermore National Laboratory |
| LMR | Liquid Metal-Cooled Reactor |
| LOCA | Loss of Coolant Accident |
| LPO | Loan Programs Office |
| LWRS | Light Water Reactor Sustainability |
| MSFR | Molten-Salt Fast Reactor |
| MSNB | Molten Salt Nuclear Battery |
| MSRE | Molten Salt Reactor Experiment |
| MSRs | Molten Salt Reactors |
| MWe | Megawatts Electric |
| MWt | Megawatts Thermal |
| MWth | Megawatts Thermal |
| NA / NPT / NA | ASME Nuclear Component Certificates |
| NASA | National Aeronautics and Space Administration |
| NASDA | NASA and National Space Development Agency |
| NDA | Non-Disclosure Agreement |
| NDE | Non-Destructive Examination |
| NEAMS | Nuclear Energy Advanced Modeling and Simulation |
| NEUP | Nuclear Energy University Program |
| NIAC | Nuclear Industry Assessment Corporation |
| NIH | National Institute of Health |
| NNL | Navel Nuclear Laboratory |
| NNSA | National Nuclear Security Administration |
| NQA | Nuclear Quality Assurance |

ACRONYM LIST (Cont.)

| | |
|-----------|--|
| NRC | Nuclear Regulatory Commission |
| NSSS | Nuclear Steam Supply System |
| NSUF | Nuclear Science User Facility |
| NUPIC | Nuclear Procurement Issues Committee |
| OEM | Original Equipment Manufacturer |
| ORNL | Oak Ridge National Laboratory |
| PARCS | Purdue Advanced Reactor Core Simulator |
| PAS | Portable Air Sampler |
| PNNL | Pacific Northwest National Laboratory |
| PRA | Probabilistic Risk Assessment |
| PRISM | Power Reactor Innovative Small Module |
| PWR | Pressurized Water Reactor |
| QAP | Quality Assurance Program |
| RADTRAD | RADionuclide Transport, Removal, and Dose |
| RELAP-5 | Reactor Excursion and Leak Analysis Program |
| RHR | Residual Heat Removal |
| RIDM | Risk-Informed Decision Making |
| RTE | Rapid Turnaround Experiment |
| SBIR-STTR | Small Business Innovation Research-Small Business Technology Transfer |
| SC-HTGR | Steam Cycle High-Temperature Gas Reactor |
| SFR | Sodium-Cooled Fast Reactor |
| SiC | Silicon Carbide |
| SMR | Small Modular Reactor |
| SNL | Sandia National Laboratories |
| SRNL | Savannah River National Laboratory |
| STUK | Säteilyturvakeskus (Finland Radiation and Nuclear Safety Authority) |
| TA | Test Apparatus |
| TEMA | Tubular Exchanger Manufactures Association |
| TOFD | Time of Flight Diffraction |
| TRACE | TRAC/RELAP Advanced Computational Engine |
| TRIGA | Training, Research, Isotopes, General Atomics |
| TRISO | TRi-structural ISOtropic |
| TVA | Tennessee Valley Authority |

ACRONYM LIST (Cont.)


RESOURCES

| | |
|---------|--|
| UCLE | U.S. Nuclear Corp. |
| UNR/NTF | University of Nevada –Nevada Terawatt Facility |
| US | United States |
| USA | United States of America |
| USACE | United States Army Corps of Engineers |
| USNIC | United States Nuclear Infrastructure Council |
| UT | Ultrasonic Testing |
| xLPR | Extremely Low Probability of Rupture |

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