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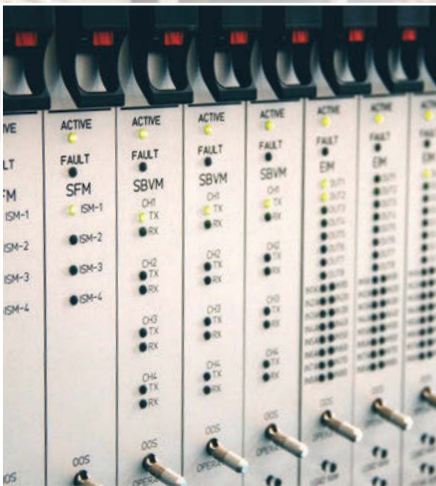
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# The Highly Integrated Protection System (HIPS) Platform is a Game Changer



**HIPS**  
HIGHLY INTEGRATED  
PROTECTION SYSTEM

Today's nuclear power plant operators want safety-related systems that work for multiple decades without major upgrades.

Previous generation digital I&C systems required frequent firmware updates and proved difficult to manage under current cybersecurity and regulatory constraints.

The SER-approved HIPS FPGA was designed with you in mind. It doesn't attempt to push the boundaries of modern technology. **It simply performs with robust, analog-like reliability while providing essential diagnostics for plants to reduce O&M costs.**

  
**Paragon**

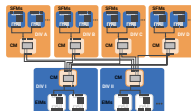
817-284-0077 | [www.ParagonES.com](http://www.ParagonES.com)

# The HIPS Platform:

## Forged on the Leading Edge of Advanced Reactor Ingenuity

### RPS Architecture

The scalable HIPS platform has complete architecture flexibility. It can be configured as a single channel or up to a full Reactor Protection System of four separation groups which votes into two divisions complete with physical and electrical isolation.



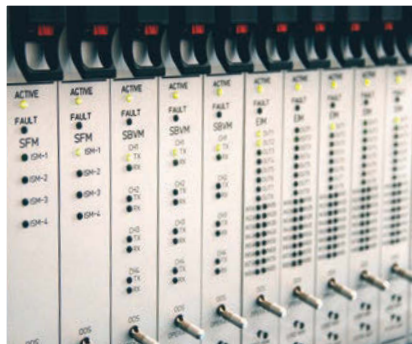
### Model-Based Design

Model-Based Design provides a significant increase in the quality of the final product and a reduction of project execution costs.

It's an all-in-one environment to meet the rigorous development requirements for safety critical systems in a significantly reduced development time by integrating both the system's functional behavior and the detailed description in one project model.

HIPS Model-Based Design automates error prone and time-consuming tasks, reducing the development time associated with code and document generation, test execution, and model checks.

Additionally, simulation of the system behavior provides the ability to examine its interaction with individual components to detect errors in requirements and design early in the development lifecycle before testing on expensive hardware.



Paragon's HIPS platform

### Class-1E SER Approval

The HIPS platform topical report TR-1015-18653-P, Revision 0, "Design of the Highly Integrated Protection System [HIPS] Platform" was submitted in 2015 in partnership with NuScale. Rev. 1 was submitted in 2016 with NRC SER approval granted in 2017.

### Software Common Cause Failures Mitigated by Internal Diversity

The diversity in our FPGA equipment, circuit designs, and software tools are the fundamental methods for mitigating the potential for digital Common Cause Failures (CCFs) in the HIPS platform.

The platform design uses two diverse FPGA technologies to achieve equipment diversity: one is a one-time programmable (OTP) or flash-based FPGA, with the other a static random-access memory (SRAM) based FPGA.

The overall HIPS diversity approach aligns with NRC BTP 7-19 and provides additional benefits by simplifying the holistic I&C facility design, since a separate diverse actuation system is not required to mitigate digital CCFs.

The diversity approach also provides analytical and regulatory review benefits, since additional 'best estimate' consequence analysis is not required. This ensures a more efficient regulatory turnaround and quicker system build for a higher level of confidence in meeting your project deadlines.

## Why is field programmable gate array (FPGA) technology the right choice for your nuclear power plant?

### SIMILAR TO DIGITAL

High reliability from comprehensive diagnostics & self-testing

Flexible components (reconfigurable, reusable, portable logic)

Fault tolerant

Software enhanced application development

Configurable communications

### ... BUT BETTER

◆ Deterministic—costs less to qualify

◆ Reduced complexity means greater regulatory certainty

◆ No executable software

◆ Inherently more cyber-secure

◆ Resilient to component obsolescence

◆ Isolation of independent functions (safety/non-safety) within the same system

◆ Quicker processing time due to parallel execution of independent functions

◆ Intuitive bypass and testability

To learn more about the HIPS Platform, visit [www.ParagonES.com/HIPS](http://www.ParagonES.com/HIPS)

# SIM-Teq is the Most Advanced Radiological Simulation System in the World.



- Adapts OEM instrument components to reach optimal training fidelity.
- Sources are 100% safe and provide realistic, detectable radiological hazard conditions.
- Significantly improves training by allowing the instructor to teach, observe, and assess the trainee, with the ability to remotely manage or control any SIM-Teq device at any time.
- Next-generation drone and robotic-based detection, Man-portable Radiological Detection Systems (MRDS), and advanced identification systems are all available.
- Designed, developed, and manufactured in the US.

SIM-Teq is a wirelessly interconnected system composed of a variety of simulated radiation detection instruments, simulated gamma/beta sources, and support hardware all controlled and configured using a simple, intuitive software application running on any Windows 10 based PC or tablet. The system is designed to meet the variety of training organization needs allowing frequent, realistic training that provides trainees with the skills necessary to successfully accomplish their roles.

## IDEAL FOR TRAINING:

- Radworkers
- First Responders
- Radiation Technicians
- DOD
- CBRNE
- Academia



# SIM-Teq®





## Advanced Fuel Management: Raising the standard for nuclear fuel

Today's light water reactor fleet is critical in helping meet climate initiatives and provide a constant source of low-carbon energy. In a competitive energy market, Framatome has committed to identifying and developing solutions to improve both the safety and economics for nuclear plant operators.

Framatome launched its Advanced Fuel Management (AFM) program, a subset of its PROtect enhanced accident tolerant fuel (EATF) program, focused on bringing a substantial improvement to fuel performance. The AFM program is focused on combining enrichment and burnup improvements to augment sustainability of the commercial nuclear reactor fleet. These two improvements to our most advanced nuclear fuel designs, taken together, improve fuel utilization, while increasing cycle lengths and reducing down time, creating significant value for plant operators.

### What is Advanced Fuel Management?

AFM is a globally integrated program designed to deliver fuel with higher enrichment and burnup limits. Enriching uranium oxide (UO<sub>2</sub>) above the traditional 5 wt% thresholds combined with Framatome's latest technology allow nuclear plant operators to maximize energy production. The increases in enrichment and burnup open the door to improved economic performance by extracting more cycle energy from a reactor core and reducing Operations & Maintenance (O&M) costs.

This program is built on more than 60 years of nuclear fuel experience and encompasses all aspects of the nuclear fuel cycle including enrichment services, regulatory licensing and fuel fabrication infrastructure.

### What are the benefits of this advanced fuel design?

As light water reactors begin operating past their original 40-year design life they continue to face increasing pressure to improve their plant's economic outlook. Framatome is modifying the traditional fuel pellet with enrichments so plants will have more flexibility for efficient core designs and longer operating cycles.

By extending traditional 18-month fuel cycles in pressurized water reactor (PWR) designs to 24-month cycles, operators can reduce outages and downtime. Over a six-year period, a plant operator can eliminate one outage, saving nearly \$30 million. Fewer outages also mean increased safety as the fuel handling and dry cask storage demands are reduced.

### Industry-wide effort

To disrupt the traditional nuclear fuel market, Framatome is collaborating with the entire nuclear energy industry to bring this new technology to market. This effort requires synergy between utilities, enrichment services, regulatory and licensing governance and Framatome.

### Project support

The project has also garnered support from the U.S. Department of Energy

(DOE) as the EATF and AFM programs can sustain the existing reactor fleet to help meet carbon reduction goals. Framatome and the DOE signed a \$150 million cooperative agreement in 2021 to support the industrialization of higher enriched fuel.

### Where are we today?

The multi-year effort achieved some major milestones in the past 18 months — most recently receiving U.S. Nuclear Regulatory Commission (NRC) approval to apply our Advanced Codes and Methods to operating conditions with uranium enrichments above 5 wt%. This approval is a critical step toward introducing advanced products with increased enrichments and burnups.

Last year, Framatome achieved another regulatory milestone when the NRC approved Framatome to transport fuel up to 8 wt%, ensuring once the fuel is manufactured it can be delivered to the customer.

### Path to commercialization

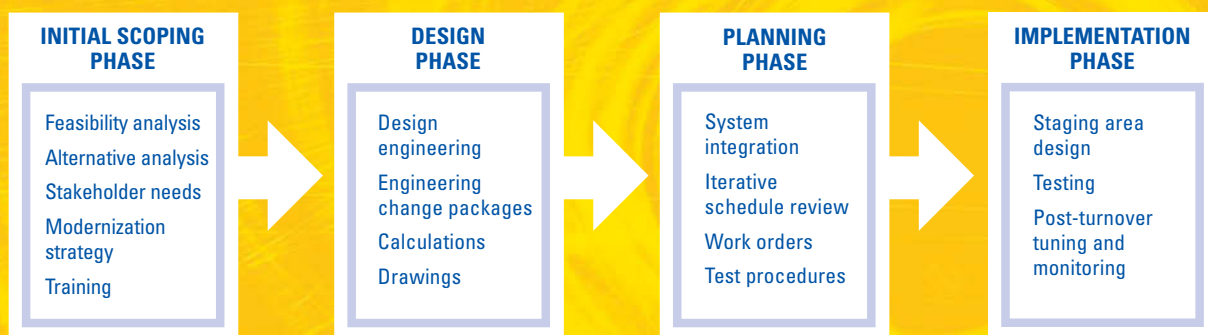
The incremental steps and project milestones that are required to bring this technology to market will take place over the next four years with a commitment to be reload ready in 2026. We recognize the challenges that await us, however when it comes to providing safer, more efficient nuclear fuel and fuel-related products to our customers, our commitment is unwavering.



# A Proven Leader in Nuclear Digital Upgrades

**For over 65 years, Sargent & Lundy has been actively involved in design and retrofit activities for nuclear units.**

We're the preeminent supplier of digital I&C services through the full digital upgrade project lifecycle and have successfully completed over 300 digital upgrade projects over the past 10 years. We understand the unique complexities of these projects and the variety of challenges our clients face in retrofit design, planning, equipment compatibility, and implementation. By leveraging our breadth of digital experience and lessons learned, we're consistently able to help clients successfully navigate these project challenges and drive projects to completion.



Sargent & Lundy is working on a rapidly growing set of consulting, technical design, and hands-on programming/system integration projects using our newly constructed I&C labs. These projects include main control room modernizations and control system upgrades that support the long-term sustainability of the U.S. nuclear fleet. When installed, our designs will enable our clients to reduce O&M costs and safely operate their nuclear assets to generate thousands of megawatts of carbon-free electricity.



#### DIGITAL I&C CONSULTING SERVICES

- Strategic digital licensing
- Requirements specifications
- Cost benefit analyses
- Digital platform selection
- Independent third-party reviews
- Human factors engineering
- Cyber security
- Training



#### DIGITAL I&C IMPLEMENTATION SERVICES

- Risk elimination
- Contingency Planning
- Configuration management
- Value engineering
- Quality planning
- Installation scripting
- Development of utility subject matter experts

**Get to know excellence.  
Get to know Sargent & Lundy.**

**[sargentlundy.com](https://sargentlundy.com)**

## NAC INTERNATIONAL'S SERVICES AND CAPABILITIES DELIVER INTEGRATED NUCLEAR WASTE MANAGEMENT

**A**s the nuclear energy industry grows to support clean energy goals and increased energy demand, NAC has expanded its portfolio of services and products. Building on our proven storage and transportation solutions for spent fuel, high assay materials and other nuclear materials, and fuel cycle consulting and information, NAC now includes capabilities that address additional waste management requirements.

### **NAC LPT – Packaging Solutions for Radioactive Waste and More**

NAC LPT develops best-value technical strategies and plans for logistics, packaging, transport, and disposal, and delivers equipment from a fleet of IP-1 intermodal containers, IP-1 gondola railcars, and ABC railcars for LLRW and hazardous material shipments.

NAC LPT experts provide impartial, comprehensive, and creative waste management solutions for government and commercial projects.

### **NAC PHILOTECHNICS – Waste Processing, Transport, Brokering, Radiological Services**

NAC Philotechnics is a health physics, radiological services, and waste management company. An integrated waste broker and processor, NAC Philotechnics handles and manages LLRW and mixed wastes. The company is a proven decontamination and decommissioning service provider for laboratory, university, and small industrial facilities.

### **NIAGARA ENERGY PRODUCTS (NEP) – Nuclear Fabrication**

NAC's recent acquisition of NEP

provides high-quality, large-scale fabrication, welding, and machining with over 220,000 ft<sup>2</sup> of manufacturing capacity and a talented staff in areas critical for production and delivery of nuclear components. NEP also has engineering services to optimize product performance and economics. As a long-time provider of components and equipment to the Canadian nuclear industry, NEP provides a solid addition to NAC's capabilities for work in Canada.



For additional information, please contact  
George Vaughan, Vice President of Business  
Development at [gvaughan@nacintl.com](mailto:gvaughan@nacintl.com) /  
770.447.1144, or visit us at [www.nacintl.com](http://www.nacintl.com).

## NAC INTERNATIONAL'S GROWING FAMILY OF COMPANIES SUPPORTS NUCLEAR ENERGY'S ROLE IN MEETING WORLDWIDE CLEAN ENERGY NEEDS



- U.S. NRC-licensed storage for used fuel, nuclear waste
- Licensed transport options for used fuel, high assay, other nuclear materials
- Nuclear fuel cycle consulting and information



LOGISTICS  
PACKAGING  
TECHNICAL SERVICES

- Packaging and transportation assets
- Rail and OTC logistics expertise
- Radioactive and hazardous wastes



- Low-level radioactive/hazardous wastes
- Waste processing, brokering, transportation
- Radiological/HP services



- Nuclear-grade components and containers
- Large-scale fabrication, welding, machining
- Shielded containers, vessels, flasks

### **CONTACT US:**

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At Westinghouse, the Westinghouse Parts Business plays a vital role in maintaining the critical assets of our customers and in helping to ensure safety and reliability through the high-quality spare and replacement parts, component repair services and equipment upgrades.

Obsolescence and the ability to obtain qualified replacement and spare parts are primary concerns in the nuclear industry — Westinghouse can support continued operation of nuclear systems by providing solutions to individual obsolete parts or by creating and managing a platform obsolescence program.

When dealing with instrumentation and control (I&C) parts, Westinghouse has experience scaling solutions (redesign, inventory strategies, sourcing, etc.) for customer needs.

Westinghouse is supporting multiple customers with obsolescence management support for Westinghouse-designed I&C parts as well as providing solutions for obsolete parts used in alternative I&C systems. The Westinghouse I&C parts team can apply this experience to evaluate installed systems and provide options for repair, replacement or upgrade.

Westinghouse has provided a wide range of industry obsolescence solutions by leveraging vast supply chain and engineering knowledge:

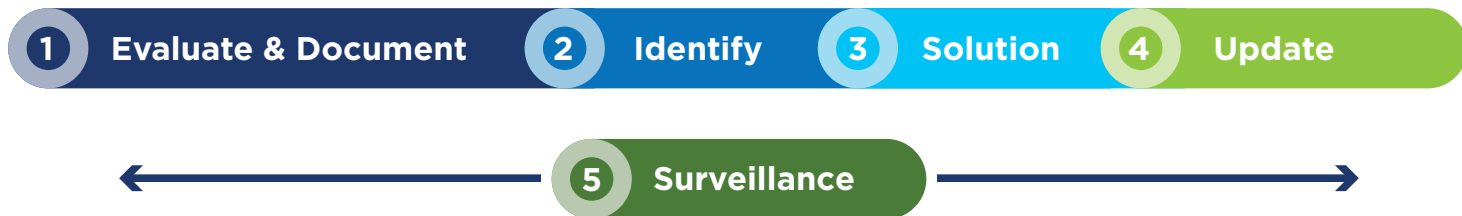
**Lifetime Management Strategies:** Provided detailed assessments for large number of I&C systems that include a recommended strategy with indicative costs; implementation timescales; and engineering and sourcing risks

**Power Supply:** Provided cost efficient redesigned solutions for both OEM and non-OEM products

**Analog Circuit Board:** Robust in-house capabilities and supplier network supports maintaining old analog circuit board design capacity

**Flat Panel Display:** Repair solution was identified to extend the life of the installed system

**Resistance Temperature Detector:** Variety of models have been redesigned and qualified

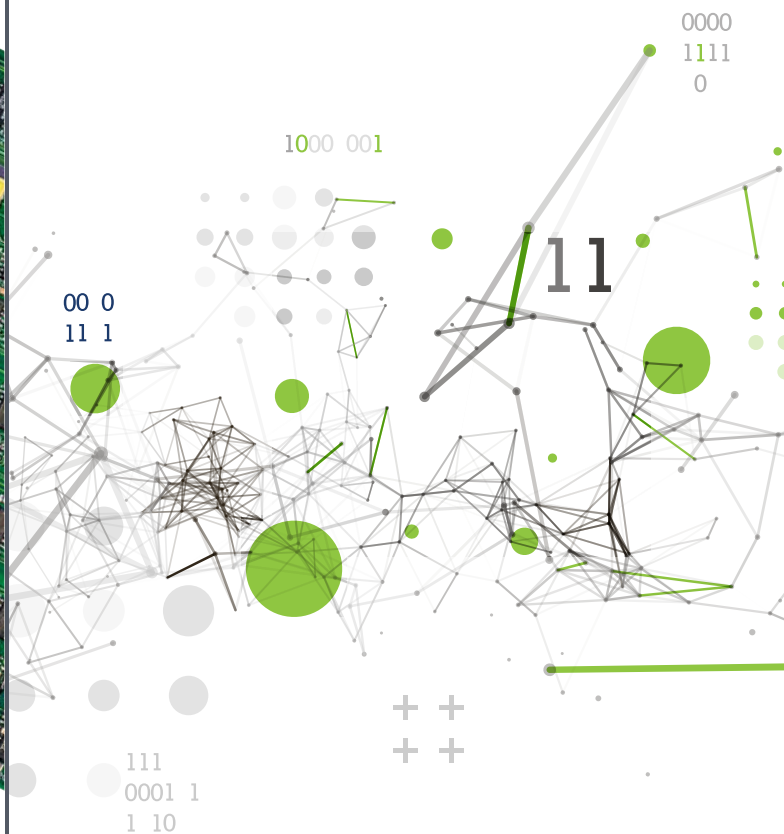
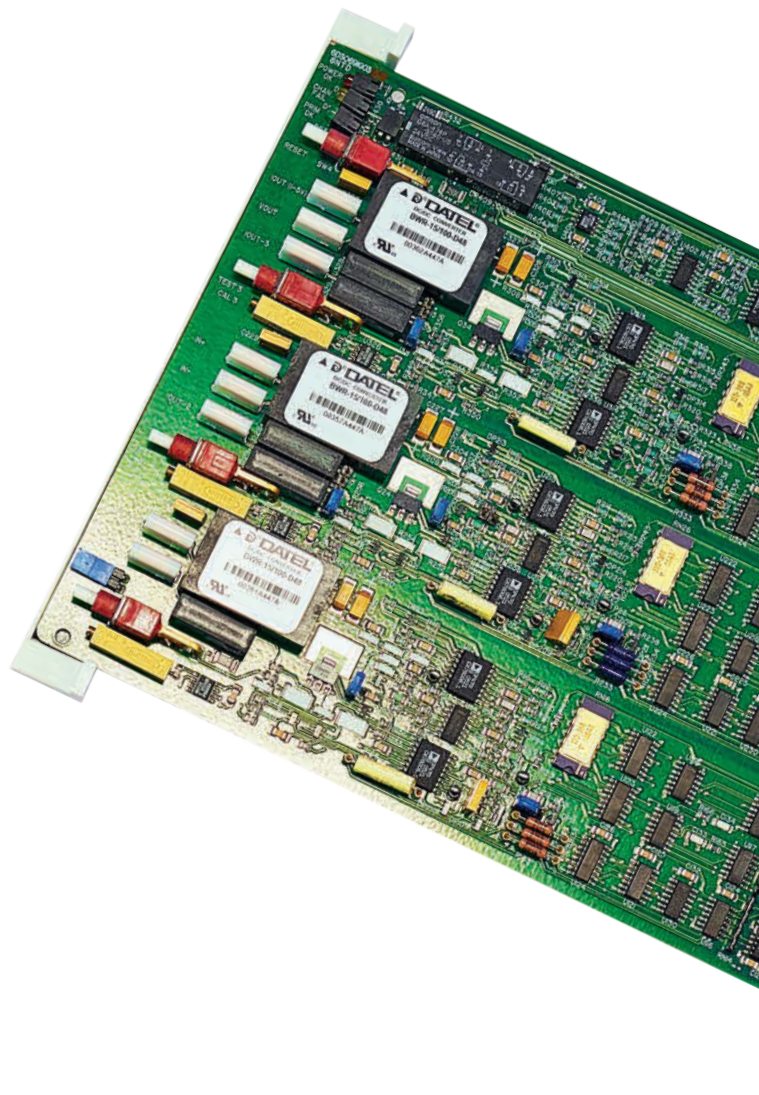


Westinghouse can work with sites to create a custom program to implement I&C hardware obsolescence programs which include a programmatic approach comprised of five elements,

- 1 Evaluate and document systems
- 2 Identify obsolescence
- 3 Develop solutions (repair, replace or upgrade)
- 4 Update documentation
- 5 Continue surveillance

To learn more about Westinghouse Parts Business and how we are looking to solve I&C obsolescence issues please contact Dan Sadlon ([sadlond@westinghouse.com](mailto:sadlond@westinghouse.com)) or Ashlyn Fornear ([forneaam@westinghouse.com](mailto:forneaam@westinghouse.com)).





# Electronics You Can Count On

When it comes to circuit boards and electronics, whether it is direct replacement, alternative supply or refurbishment, the trusted experts from Westinghouse Parts can support obsolescence issues at **100% of the world's nuclear plants.**

To learn how Westinghouse Parts utilize-readily available components based on original designs, contact a specialist at [www.westinghousenuclear.com/contact-us](http://www.westinghousenuclear.com/contact-us)



# Over 40 Years of Nuclear HVAC Experience

SSM Industries has over 40 years experience designing, qualifying, fabricating and installing HVAC ductwork and equipment in DOE facilities and Nuclear Power Plants around the world.

Our Quality Program has remained in step with the latest industry requirements and can support your NQA-1, ASME AG-1, 10CFR50 Appendix B requirements. Our fabrication personnel have been trained, qualified and maintain certifications in accordance with ASME and AWS

Let us work with you on all of your HVAC needs. From custom retrofits to new plant build, we are the HVAC solution that you have been looking for.



## HVAC SYSTEM COMPONENTS

Access Doors  
Actuators: Electric & Pneumatic  
Air Handling Units  
Charcoal Adsorber Units  
Dampers:  
Backdraft  
Balancing  
Bubble-Tight  
Control: Manual,  
Electric & Pneumatic  
Diverter  
Fire & Smoke  
Guillotine  
HELB  
Isolation

Tornado  
Variable Frequency Drives  
Ductwork & Supports  
Fans: Axial & Centrifugal  
Filters & Filtration Units  
(incl. HEPA)  
Flexible Connections  
Grilles, Registers &  
Diffusers  
Housings  
Heat Exchangers  
Cooling Coils  
Louvers  
Plenums  
Sleeves

## SPECIALTY FABRICATIONS

Angle Rings  
Cable Trays & Covers  
Control Cabinets  
Doors: Access,  
Heavy-Duty & Blast  
Equipment Bases  
Filter Boxes  
Fire Barriers  
U. L.-Rated, 3 Hour  
Glove Boxes  
Sealed Enclosures  
Seismic Supports  
Cooling Coils  
Heating Coils  
Heat Exchangers  
Tanks



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**3401 Grand Avenue, Pittsburgh, PA 15225**

**412-901-1467 cell/text**

**412-777-5101 office**



# Nuclear HVAC fabricator

**SSM Industries, Inc.** entered the nuclear industry over forty years ago as the metal fabrication division of Schneider Power, based in Pittsburgh, Pennsylvania

**THE POWER DIVISION OF SSM** Industries Inc. provides design, qualification, fabrication, and installation support to the global nuclear market. Over \$250 million of safety and non-safety related HVAC ductwork and components have been designed, tested and fabricated in our facility for use in nuclear power plants. We have supplied safety related equipment to most commercial nuclear power plants in the United States, as well as Europe and Asia.

SSM has performed complete HVAC fabrication and installation at seven nuclear power plants in the United States, and we have fabricated and supplied complete HVAC equipment scopes for nuclear power plants worldwide. These scopes include all dampers (bubbletight, tornado, manual, fire/smoke), fans (vaneaxial, centrifugal) and various components such as louvers, supports, grilles and registers.

Our nuclear qualified product line extends from the fan to the diffuser, and all HVAC products in between. In addition, we work with many plants to customize and perform commercial grade dedication activities.

One recent project for a European plant included designing, qualifying and fabricating a vaneaxial fan to replace an obsolete Reactor Containment Cooling Fan. With

our experience and our partners we can find solutions for your obsolete equipment.

SSM is committed to being your source for solutions, world-class products and exceptional service. We are committed to supporting any needs you have whether big or small. We believe in integrity and customer commitment in all that we do.

SSM maintains a complete ASME NQA-1 and 10CFR50 Appendix B Quality Assurance Program. SSM is listed in the NUPIC database as a pre-qualified vendor to supply Safety Related HVAC equipment and services, including the commercial dedication of components fabricated by others, to all commercial nuclear plants. ■



SSM INDUSTRIES, INC.  
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E: mgorman@ssmi.biz  
W: www.ssmi.biz

Top row: **Truckload of duct for Vogtle 3 & 4**

Bottom row (from left to right): **48 inch round Safety Related Bubble Tight Damper**

**Safety Related Bubble Tight Damper with undermount actuator**

**Safety Related**

**Vaneaxial Fan**

**undergoing**

**performance testing**



# The best imager for many applications.....

# The only imager for some!

Thermo Scientific – CIDTEC is a supplier of radiation hardened, machine vision, and scientific cameras based on the proprietary Charge Injection Device (CID) technology for use in the most demanding imaging applications.

## MegaRAD3 series

- The MegaRAD3 series of cameras are capable of operating in high dose radiation environments such as nuclear reactors, fuel inspection, hot cell monitoring, remediation, surveillance, and X-ray imaging applications. Most importantly, this capability can now be provided in either Monochrome or Color version cameras, with remote head cable lengths up to 150-meters.
- The radiation hard PPP (Preamplifier Per Pixel) CID imager technology allow exceptional signal to noise with sensitivity never before available with radiation hardened cameras.
- These cameras have been tested and proven in high levels of gamma radiation, and since readout is within the pixel, loss due to SETI's (single event transfer inefficiencies) is minimized.

- CID based cameras allow at least an order of magnitude improvement in operation when compared to CCD and CMOS based cameras and imagers.

## Charge Injection Device

- The Charge Injection Device (CID) is a solid state imaging sensor with capabilities well beyond the limitations of today's consumer Charge Coupled Devices (CCDs). Like a CCD, the CID uses pixels to capture images, converting light into an electronic charge which is directly displayed on a monitor or captured digitally on computer.
- The superior resistance to radiation is a significant advantage for radiation tolerant imaging within facets of the nuclear power industry, medical, dental, and space based applications, and the inherent anti-blooming performance of the CID ensures accurate image detail even under extreme lighting conditions.
- The CID is uniquely positioned to serve the growing imaging market and the challenges for higher levels of accuracy in the radiation tolerant inspection market, as well as machine vision, scientific imaging.
- Thermo Scientific - CIDTEC is the leading manufacturer of CMOS imagers using the CID pixel architecture, and supply imaging solutions to OEM's as well as end-users throughout the world.

### In the United States:

For customer service, call 1-800-888-8761  
To fax an order, use 1-315-451-9421  
Email: sales.cidtec@thermofisher.com

### International:

For customer service, call [01] 315-451-9410  
To fax an order, use [01] 315-451-9421  
Email: sales.cidtec@thermofisher.com

Find out more at [thermofisher.com/cidtec](https://thermofisher.com/cidtec)

**ThermoFisher**  
SCIENTIFIC



# Got radiation? See what you've been missing



## Imaging in radiation environments just got easier

With superior capabilities for operating in radiation environments, the MegaRAD cameras provide excellent image quality well beyond dose limitations of conventional cameras, and are well suited for radiation hardened imaging applications



**MegaRAD3 produce color or monochrome video up to  $3 \times 10^6$  rads total dose**



**MegaRAD10 produce color or monochrome video up to  $1 \times 10^7$  rads total dose**



**KiloRAD PTZ radiation resistant camera with Pan/Tilt/Zoom**

### In the United States:

For customer service, call 1-800-888-8761  
To fax an order, use 1-315-451-9421  
Email: [sales.cidtec@thermofisher.com](mailto:sales.cidtec@thermofisher.com)

### International:

For customer service, call [01] 315-451-9410  
To fax an order, use [01] 315-451-9421  
Email: [sales.cidtec@thermofisher.com](mailto:sales.cidtec@thermofisher.com)

Find out more at [thermofisher.com/cidtec](http://thermofisher.com/cidtec)

**ThermoFisher**  
SCIENTIFIC



**Q: So how can you perform challenging, heavy duty, D&D work in Hazardous environments at nuclear sites in complete safety?**

**A: Well if you are familiar with BROKK remotely operated machines, you will know that over the past 40 years more than 10,000 BROKK machines have**

**been deployed worldwide in the most hazardous of environments. Furthermore, you may also be aware that there have been no injuries incurred by operators using BROKK equipment deployed on some of the most challenging projects at nuclear sites worldwide.**

We can all appreciate the significant negative impact to a project if there is an injury, a near miss, exposure to radiation or exposure to hazardous materials for any individuals engaged on the project. This negative impact may go beyond the project, to the overall site, even to the industry itself. The use of BROKK remotely operated

equipment keeps the operators at a safe distance from the hazardous workplace avoiding the possibility of injury or exposure.

#### **BROKK Features and Benefits**

An important advantage of BROKK equipment is high productivity, so safer does not mean slower. Very powerful tools are rapidly deployed by the BROKK machines to complete work effectively and to help bring projects in ahead of time and under budget.

BROKK offers hundreds of standard and custom designed tools and attachments for our machines to ensure that the best tools for the job are always available.

With these multiple attachment choices, compact size, ease of maneuverability and an intuitive control system, BROKK is now established as the nuclear industry standard for safe, powerful, reliable, rugged, high performance, remotely operated equipment. Our unmatched 40 years of deployment experience and the lessons learned from this have been incorporated into our latest generation of equipment. Many upgrades and improvements have been made to continually improve the performance of our equipment based on direct feedback and our extensive operational experience.

Innovative BROKK features such as our "NQH" auto-tool change interface avoids any operator radiation exposure on projects requiring multiple tools and a variety of functions to be performed by a single machine. Vision systems, additional radiation hardening and auto recovery systems are also available as integrated machine options where required.

#### **BROKK Technical and Customer Support**

BROKK has a dedicated internal Special Engineering Group to assist our customers in defining the best overall solution to meet the project goals. We continue to provide ongoing technical support for all of our customers after equipment delivery, through the duration of the project. We stock a full range of spare parts which are typically shipped out the same day as they are requested. We also provide on-site technical support and certified operator training at the customer's site(s) as needed.

#### **BROKK Custom Design and Special Applications**

The BROKK Special Engineering Group can also develop custom designed machines and custom designed attachments where needed for special projects. We have a proven track record of successfully working with our customers to develop and deploy application specific solutions.

For more information Contact Tony Marlow  
Tel: (505) 699 8923, email: [tony.marlow@brokkinc.com](mailto:tony.marlow@brokkinc.com)  
[www.brokk.com/us](http://www.brokk.com/us)

## Over 10,000 machines deployed

TUNNELING  
CONSTRUCTION  
MINING  
**NUCLEAR**  
PROCESS  
CEMENT



## Extraordinary power and reliability for extraordinary jobs.

**Some projects require a special solution.** Brokk offers a unique and well proven combination of equipment, design, engineering and technical support for the most challenging projects at nuclear facilities.

Brokk is the industry leader for safe, rugged, reliable, heavy-duty, remotely operated equipment and with 8 available base machine options, there is a Brokk machine size available to suit each application without compromise.

Brokk machines are available with many standard options including vision systems, radiation hardening, auto tool change, auto recovery capabilities and more. They can also be customized and fitted with additional special options as needed for specific customer projects

Brokk also offers hundreds of standard and custom designed tools and attachments for our machines. With our standard quick change attachment interface or our optional fully remote tool change interface, a single Brokk machine can perform multiple tasks in hazardous environments with the operator always working in complete safety.

Now add to that over 40 years of Brokk deployment experience, our in-house engineering and technical support staff, on-site training and after sales support and you can see that Brokk provides comprehensive support to our customers who are working on very challenging projects.

For more information Contact Tony Marlow Tel: (505) 699 8923, email: [tony.marlow@brokkinc.com](mailto:tony.marlow@brokkinc.com)

**Original Demolition Power™**







## We deliver on our promises

- ✓ Energy security for North America through increased capacity
- ✓ Advanced fuels for future nuclear reactors
- ✓ Creating a net zero future

## UUSA is the only large-scale, commercial, domestic uranium enrichment facility in North America

Located in the heart of the EnergyPlex, Eunice, New Mexico, UUSA delivers trusted, safe, and innovative uranium enrichment services for the nuclear industry. Our leading centrifuge technology, multi-billion dollar facility and dedicated U.S. workforce is ready to fuel a sustainable, net-zero world.

UUSA currently provides 1/3 of the US demand for enrichment services. Our current annual capacity is 4.6 million SWU with room to respond to increases in market demand.

UUSA is making strategic investments to provide higher levels of enriched uranium to support the next generation of nuclear reactors.

We deliver on our promises and we are proud to do our part in providing clean energy to the world.

e: [communicationsuusa@ureenco.com](mailto:communicationsuusa@ureenco.com)  
[urencousa.com](http://urencousa.com)





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## Recognized **Leader** in Radwaste Management

Helping you succeed for over 40 years

### PROFILE SUMMARY

Founded in 1979, and headquartered in Peekskill, New York, WMG provides the nuclear industry with professional nuclear engineering, waste management and software services. Anchored by our industry standard RADMAN™ Suite software for radioactive shipments, WMG has continued to provide innovative solutions to the industry's most complex challenges.

#### ENGINEERING

We pride ourselves as being the industry leader in providing defensible characterization and classification results.

We have the experience to know which analysis tool is appropriate for any shielding calculation.

We apply 200+ years of collective staff nuclear industry experience in our approach to solving unique waste management challenges.

We are an experienced designer and supplier of packaging that is compliant with the applicable NRC and DOT regulations.

#### SHIPPING SUPPORT

As the average age of utility personnel continues to rise, the resource pool of qualified radioactive waste managers and shippers is shrinking. WMG's Subject Matter Expert (SME), ProShipper™ and Shipping Command Center support services bring a practical solution to filling gaps in a utility's radwaste workforce.

Customers can opt for on-site or off-site shipper support as appropriate to fit operational needs.

WMG's broad spectrum of experience provides our clients with a reliable and efficient resource to help manage their most challenging radioactive waste issues. We have the expertise to ensure projects are completed.

#### SOFTWARE

WMG is committed to providing the best possible solutions for our customers' software needs. Our trusted solutions have been the industry standard for over 40 years. Our RADMAN™ Platform is utilized at nearly every U.S. nuclear power station, many radwaste processors, disposal facilities, government labs, state agencies and other industry supporting businesses.

The RADMAN™ Platform is now more powerful with the integration of the RADMAN™ Enhanced Accuracy Characterization, or REACH™ Detector System. Waste characterization just got easier - discover the difference with REACH™

To this day, through decades of industry and regulatory changes, the RADMAN™ Platform is still the standard and remains the only NRC approved application for the characterization of radioactive material.

#### TRAINING

WMG has been training industry technicians and professionals for over 30 years. Each course is delivered to the student by seasoned and highly experienced shippers.

Our courses, both standard and customized, are comprehensive, structured and meet the training requirements established by NRC IE Bulletin 79-19 and 49 CFR Part 172, Subpart H. Our courses can be taught at the client's facility, or at regional locations.

### TRUST

Trust is fragile. It is difficult to earn and easy to lose. As our industry has evolved, companies have come and gone, yet WMG continues to thrive, in large part because of the trust our clients have in our capabilities. Our success is entirely dependent upon your success.

Recent years have put increased pressure on our industry, and we are all asked to do more with less in the name of survival. Experienced professionals are retiring from the industry and in many cases, this process knowledge and expertise isn't being replaced.

As a proud, independent, family-owned small business, specializing in software, engineering, characterization and management of radioactive material, our employees have always been our greatest asset. Our employees are recognized experts in the industry and highly respected by clients, competitors, regulators and industry groups for their capabilities and experience.

Even with all of the new challenges we face, our mission of providing excellence in radioactive waste management through service, innovation, value and integrity remains unchanged, and more important than ever.

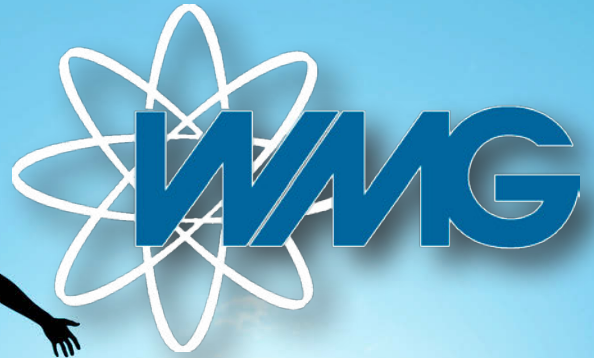
Allow us the opportunity to earn your trust and we will show you what it means to have a partner in the industry that is just as committed to your success as you are.

Sincerely,  
Kevin Tuite  
President and CEO  
WMG, Inc.

Service... Innovation... Value... Integrity...



Service... Innovation... Value... Integrity...



# Recognized Leader in Radwaste Management

Helping you succeed for over 40 years

## → ABOUT OUR COMPANY

WMG provides the nuclear industry with professional nuclear engineering, waste management and software services. Anchored by our industry-standard RADMAN™ Suite software for radioactive shipments, WMG has continued to provide innovative solutions to the industry's most complex challenges.

## → WHY CHOOSE US

As our industry has evolved, companies have come and gone, yet WMG continues to thrive, in large part because of the trust our clients have in our capabilities.

## → GET IN TOUCH

16 Bank Street, Peekskill, NY 10566  
914.736.7100  
[www.wmginc.com](http://www.wmginc.com)  
[info@wmginc.com](mailto:info@wmginc.com)



### ENGINEERING

We apply 200+ years of collective staff nuclear industry experience in our approach to solving unique waste management challenges.



### SOFTWARE

WMG is committed to providing the best possible solutions for our customers' software needs. Our trusted solutions have been the industry standard for over 40 years.



### SHIPPING SUPPORT

WMG's broad spectrum of experience provides our clients with a reliable and efficient resource to help manage their most challenging radioactive waste issues. We have the expertise to ensure projects are completed.

## Ultra Energy engineers innovative measurement and control solutions that help nuclear businesses succeed

Ultra Energy's vision is to see nuclear power fulfil its potential to create a cleaner and more secure world. Our contribution is to supply nuclear-focused organisations with nuclear-qualified measurement and

control solutions that ensure they maintain the safety of critical processes, at the same time as improving their ability to achieve commercial objectives. By ensuring nuclear power continues to be among the very safest

sources of zero carbon electricity, we help the industry to grow.

- Supplying proven measurement and control solutions for large new-build nuclear plants
- Refurbishing, remanufacturing or reverse-engineering aging or obsolete systems to extend the life of nuclear fleets
- Supporting developers of SMRs and advanced reactors to reach their project and commercial goals
- Monitoring and managing the lifecycle of radioactive material to minimise safety risks

# ULTRA. | Energy

## Nuclear safety solutions engineered for your success

- Reactor protection
- Neutron monitoring
- Temperature & pressure
- Radiation monitoring

Ultra Energy has been part of the nuclear industry since its first major expansion in the 1960s and the IP we've created in nuclear safety is unique. Today, the industry faces significant challenges in its pursuit of growth but is focused on overcoming constraints on its progress. Ultra Energy shares that focus and is the supply chain partner that will deliver the critical benefits of proven solution design and manufacture capability, an unwavering commitment to quality, and the deep expertise needed to deliver innovation that is effective, efficient and compliant with regulatory frameworks.

We are certain that nuclear power is entering a new golden era. It is the best placed energy source from which to reliably generate low-cost zero carbon electricity and so support both human welfare and our responsibilities to planet Earth. It is an exciting time to be in this industry and we look forward to making breakthrough progress with our customers to change the world for the better.



Visit us at [ultra.energy](https://ultra.energy)



**MIRION**  
TECHNOLOGIES

## Mirion Technologies provides products and services for a wide range of radiation safety, measurement and scientific purposes.

Mirion solutions are employed in advanced space, technology and research applications as well as to secure critical facilities, protect people from radiation exposure and limit the spread of contamination.

Our organization is comprised of over 1700 talented professionals, passionate about delivering world class products, services, and solutions to our customers.

From our operating facilities across North America, Europe, and Asia, Mirion Technologies offers products and services in **6 key areas**:

- Health Physics
- Radiation Monitoring Systems
- Spectroscopy
- Characterization
- Dosimetry Services
- Sensing Systems

### Sensing Systems Division

The Sensing Systems Division, maker of IST and IST-Conax range of products, offers a range of operational safety and non-safety radiation monitoring equipment, including in-core and out-of-core detectors and electrical penetrations. This equipment is used by power generation establishments to ensure the safe and efficient operation of their facilities. In addition, Mirion manufactures the associated electronics, temperature sensors, thermocouples, special purpose valves, connectors, cable/ connector assemblies and electrical conductor seal assemblies.

The entire Mirion team is dedicated to providing a new standard of solutions for our customers in nuclear facilities, military and civil defense agencies, hospitals, universities, commercial, state

and national laboratories, and other specialized industries.

*For more information about our wide range of products and services visit:*  
**[www.mirion.com](http://www.mirion.com)**



**MIRION**  
TECHNOLOGIES

SENSING SYSTEMS DIVISION

### Operational Safety & Non-Safety Radiation Monitoring Equipment

## Out-of-Core Detectors, In-Core Detectors & Electrical Penetrations



*Proven quality **SOLUTIONS** to meet your requirements*

Sensing Systems Division  
315 Daniel Zenker Drive  
300 IST Center  
Horseheads, NY 14845 USA

Phone: 607-562-4530  
FAX: 607-562-4482  
Email: [ist@mirion.com](mailto:ist@mirion.com)



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# PETERSEN

A PRECINMAC Company

Your source for nuclear grade containers, casks, gloveboxes, melters, reactor services, and process equipment.

## SERVICES

- NQA-1 Fabrication
- Precision Machining
- Advanced Manufacturing
- Piping Fabrication
- Assembly
- Integration
- Field Services
- Design Engineering
- Warehousing/Distribution



[peterseninc.com](http://peterseninc.com)

(801) 732-2000



# PETERSEN

A PRECINMAC Company

Petersen is a leader in advanced manufacturing, fabricating, and machining specialized and high-grade containers/casks, gloveboxes, melters, reactor services, and process equipment for the nuclear industry.

Many Department of Energy projects have relied on Petersen's high-quality NQA-1 expertise including the Hanford Waste Treatment Plant, Savannah River Site, WIPP, LANL and more. Additionally, many clean-up, demolition, and disposal projects have contracted with Petersen to produce process equipment to support the safety and proper storage of radioactive material.

## NUCLEAR GLOVEBOXES

Petersen glovebox enclosures provide a safe and controlled processing and handling system for nuclear projects. Providing only the highest grade nuclear glovebox equipment, our gloveboxes have been used in high-profile projects such as the Department of Energy's MOX project at the Savannah River Site, the Waste Treatment Plant – River Protection Project vitrification facility at the Hanford, Washington State site and LANL CMRR Project.

### Our gloveboxes are used in systems like:

- UPF at Y12
- Research and development
- TRU waste processing, characterization and packaging
- Radioactive material handling
- Tritium capture and processing

## CASKS

Petersen is an industry leader in the manufacturing of spent fuel containers and casks, including lead-lined. Spent fuel refers to nuclear fuel elements that have been used at commercial nuclear reactors but are no longer capable of economically sustaining a nuclear reaction.

This spent nuclear fuel then needs to be properly and disposed stored. Companies have relied on us to produce high quality containment products for safe, reliable storage of spent fuel. Our in-house proven quality systems and experience ensure that products are being manufactured to the highest standards in the industry.

## REACTOR SERVICES

With more than 20 years of experience in commercial nuclear reactor services, Petersen is equipped to safely supply products that handle radioactive treatment needs. We continue to provide ongoing safe solutions to high-profile projects with the Department of Energy, utility, and nuclear related customers. Our planning and expertise ensure timely service, successful project implementation and execution for our clients.

## PROCESS EQUIPMENT

Petersen offers state-of-the-art facilities specializing in the manufacturing of process equipment, transportation equipment, special handling and monitoring equipment, as well as spent fuel containment containers and casks of all sizes. We also provide custom manufactured equipment for decommissioning projects.

We continue to manufacture process equipment that is used to develop and test new processes to meet the demands of nuclear facilities and technology advancements.

Our safe, customer friendly environment and experience allows the Petersen team the ability to interface and work alongside our customers' team on a daily basis and we welcome on-site support.

## Certifications

- ASME U, U2, S, R
- NQA-1
- ISO9001:2015
- NRC Subpart H of 10CFR71
- AS9100 Rev D
- AISC





# F&J SPECIALTY PRODUCTS, INC.

*The Nucleus of Quality Air Monitoring Programs*



## Company Profile

High Volume  
Air Samplers



World Calibrator



Indoor/Outdoor  
Emergency Response Air Sampler  
Ruggedized Enclosure



F&J endeavors to ensure its air flow measurement instruments are accurate, reliable and maximize automation for the convenience of the air sampling specialist.

F&J has a standard business strategy to implement current technology in the development of air sampling and air flow calibration instruments.

F&J implements technology driven solutions to simplify the data collection and data analysis process for the benefit of its customers.

F&J is a certified ISO 9001 and ISO 17025 air sampling instruments provider whose contributions to air sampling design ensures the air sampling specialist has the best tools to meet the ever increasing regulatory challenges in a limited manpower environment.

### INTRODUCTION OF OUR PRIMARY BUSINESS

#### Air Flow Calibration Instruments

- High Level - World Calibrator Series - PC Interfaceable Series/User Customizable - The ultimate in end-user customization
- Mid Level - Compact Digital V.2 Series
- Level One - Mini-Calibrator Series

#### Common Features Include:

- Correction of Flow Rates and Volumes to a Reference T and P
- Optional correction to Ambient T and P
- Digital display of Flow, Temperature and Barometric Pressure
- Selection of Engineering units for measured and calculated parameters

### TRADITIONAL AND ADVANCED TECHNOLOGY AIR SAMPLING SYSTEMS

- High Level - Global Air Sampling Systems
  - The ultimate in end-user customization, data management and report writing features
- Mid Level - Digital Flow Meter Systems
  - Automation of the air sampling process
- Level One - Analog Systems

#### Common Features Include:

- Rugged, Reliable and Electrically Safe
- Technology Options to match regulatory requirements
- Pricing Options to match budgets







# F&J SPECIALTY PRODUCTS, INC.

The Nucleus of Quality Air Monitoring Programs

## F&J Advanced-Technology Instruments



**DF-ABM50-100L-AC**  
Low Volume Air Sampler  
Brushless Motor and  
Very Low Maintenance  
Vacuum Pump



**DF-ABM50-75L-20Li**  
Indoor/Outdoor  
Emergency Response Air Sampler



**HV-1V.2**  
Portable High Volume  
Air Sampler



**TEDA**  
Impregnated Charcoal  
Cartridges



**DF-ERHV-DT**  
High Volume Emergency Response  
Air Sampling System  
(8" x 10" Filter)



**Filter Holders**  
Plastic, Stainless Steel, Aluminum



**Personal Air Samplers**



# Nuclear industry leader for over 50 years

The Energy and Nuclear industry has sought Teledyne Brown Engineering's support for over 56 years as a leader in providing innovative systems engineering, cutting edge technology, radiological analysis, and advanced manufacturing solutions. The company's strengths in both engineering and manufacturing, first-of-a-kind and one-of-a-kind systems and components, along with stringent quality standards, enable them to provide customers with crucial solutions.

Teledyne's Radiological laboratory performs over 60% of the environmental radiological sample analysis for the US commercial nuclear power plant fleet. It also supports international power plant

customers, decommissioning facilities and locations being remediated.

**Teledyne's Radiological laboratory performs over 60% of the environmental radiological sample analysis for the US commercial nuclear power plant fleet.**

Teledyne also possesses a laboratory that develops and manufactures extremely sensitive noble gas monitoring equipment. These systems sense the atmosphere for evidence of underground nuclear detonations in support of the comprehensive nuclear test ban treaty. This team was recently recognized by the Federal Laboratory Consortium for

Technology Transfer and won an R&D 100 award for commercializing the government laboratory prototype system for international use.

Teledyne Brown Engineering also supports projects of varied sizes for the National Nuclear Security Administration and the Department of Energy. They are involved in the development of designs and components for Advanced Nuclear Reactors including small modular reactors, micro reactors, and fusion reactors. The company has maintained a variety of ASME stamps and certifications allowing them to perform work and build systems according to nuclear industry specifications and standards.



Our strengths in engineering, manufacturing, and compliance to stringent nuclear quality standards provides our customers exacting design and build solutions.

◀ Scan the QR code to visit [tbe.com/what-we-do/markets/energy-environment](https://tbe.com/what-we-do/markets/energy-environment)

Our strengths in characterization of NORM, medical isotopes, D&D, and broader nuclear applications provides our customers rapid turnaround, competitive pricing, and customized environmental reporting solutions.

Scan the QR code to visit [tbe.com/lab](https://tbe.com/lab) ▶



Helping you achieve  
**ENERGY &  
ENVIRONMENTAL  
SUSTAINABILITY**



**TELEDYNE  
BROWN ENGINEERING**  
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[tbe.com](https://tbe.com)



## Reef Industries in the Nuclear Industry

There are various components in nuclear power plants that are subjected to harsh environments. These components must be able to withstand a variety of factors including high temperatures and pressures, in addition to contaminants, dust, and debris. Griffolyn® specialty plastics can meet these requirements and bring added benefits such as tear resistance, fire resistance and UV stabilization.

Reef Industries has been providing the nuclear industry with construction, maintenance and outage protection for over a quarter of a century. Utilizing Reef's collection of custom fabrics, Reef Industries continues to provide products for plant maintenance, contamination control and reliable storage solutions.

Foreign Material Exclusion (FME) is the process of preventing outside debris into an area or areas where that debris poses an economic risk or safety hazard. FME is practiced across the nuclear power generation community to increase nuclear safety and reduce power plant down time.

Nuclear Power Plants in the USA conduct maintenance on their Nuclear Reactors every 12-18 months during planned shutdowns (or outages) in the Fall or Spring seasons. During routine maintenance, Foreign Material Exclusion (FME) programs are used to prevent debris and foreign objects from entering components such as nuclear power generators. Preventing foreign debris is important in nuclear power plants because the presence of debris can cause outages, damage equipment, and increase the risk of worker injuries.

FME tarps help ensure that machines and parts that are important, sensitive or valuable do not get contaminated or damaged by foreign objects. This often involves extremely tight tolerances and precise measurements.

Take preventative measures to ensure components and systems are protected from foreign material with Griffolyn® reinforced tarps. Griffolyn® provides complete around-the-clock protection by preventing outside debris from entering specific areas that can cause worker injury or potential damage to sensitive equipment.

Griffolyn® fire retardant FME covers are an economical solution to prevent excessive and unnecessary expenses

resulting from fixing or replacing damaged equipment and parts caused by foreign material intrusion.

### Features:

- NFPA 701 Certified
- Fire Safety & Contamination Applications
- Highly Flexible
- High Puncture Resistance
- Custom Pantone Colors Available
- Water Clear Material Available

Transport and store your equipment with Reef Industries' performance engineered and highly tear resistant custom rotor covers. Whether providing shipping, storage and protection of parts or containment and isolation of contaminated materials during new construction, maintenance or plant outages, Reef Industries can custom design and fabricate a custom cover dedicated to providing maximum protection and to improve your company's efficiency during these critical tasks.


Reef Industries has also been protecting the nuclear industry with quality

plastics. Another Griffolyn product, GriffGuard is used to protect flooring surfaces. GriffGuard is a heavy duty, water resistant, and reusable/recyclable diamond plated floor protector. GriffGuard can cover decks, tiles, walkways, gradients, and other flooring surfaces which may require protection during maintenance and outage season. GriffGuard is a 40-mil black molded polyethylene diamond plate non-skid material which is easy to cut, move, or handle while providing protection around the job site. GriffGuard has been tested and approved to meet industry standards.

From FME covers to storage and transportation to floor protection, Reef Industries has you covered! We offer numerous materials to meet environmental compliance or safety requirements for critical equipment and work areas. From lightweight to heavy-duty products, Reef Industries can meet your requirements with a cover material specifically tailored to your application.


# PROTECT YOUR ENERGY.

**GRIFFOLYN® CAN HELP WITH  
PLANT MAINTENANCE &  
OUTAGE MANAGEMENT**



**NFPA 701 CERTIFIED • FME PROTECTION • ON-SITE STORAGE  
NO DELAYS IN OUTAGES • OUTDOOR TRANSPORTATION  
STOCK ROLLS READILY AVAILABLE • HOT WORK AREAS**

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**GRIFFOLYN®**  
DIVISION OF REEF INDUSTRIES, INC.

# ***Aecon-Wachs***



**MECHANICAL  
& ELECTRICAL  
PROJECTS**



**FABRICATION &  
MODULARIZATION**



**QUALITY  
MANAGEMENT  
PROGRAM**

**Aecon-Wachs, in collaboration with  
our parent company Aecon Nuclear,  
is a total solutions provider.**

We provide a full spectrum  
of Engineering, Procurement  
& Construction (EPC), maintenance and  
manufacturing services specifically tailored to meet  
the demanding requirements of the nuclear power industry.

**Jackson, SC | 803.508.7308 | [aecon-wachs.com](http://aecon-wachs.com)**





# Aecon-Wachs has created your One-Stop-Shop for Mechanical Construction



Whether you are designing a piping system and need to eliminate welds through pipe bending, you are replacing feedwater heaters, critical valves and pumps, or need contract supervision and labor for your outage or capital project, Aecon-Wachs has a solution to meet your demands.



**Nuclear clients appreciate our proven Safety Program, Quality Program, Weld Program and flexibility to utilize our programs and procedures OR the clients'.**

Audited by NUPIC members and NIAC members, our 10CFR50, Appendix B, ASME & ISO 9001 Programs offer you access to elite Field Service and Shop Fabrication services.



## EXPERIENCE MODIFICATION RATE (EMR)

2019 - 0.57	2020 - 0.63	2021 - 0.71
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## CORE COMPETENCIES

- Large Component Replacements
- Design, Fabricate, Install
- Turnkey Projects
- Specialty Welding & Machining
- Heat Treating, Coatings
- Lifting/Rigging
- Metrology
- Staffing

## NUCLEAR MARKETS

- New Construction
- Operating Plants
- Decommissioning
- Department of Energy
- Department of Defense
- Medicine



# Enhancing Safety and Productivity for Five Decades

BIRNS has been serving the nuclear power industry since the 1970s. Today, we continue to make work inside containment safer and more efficient, with innovative lighting solutions that save operating costs and time, for everything from fuel handling and inspection to daily tasks.



The 85,000 lumen BIRNS Lumena-6™ is an advanced, intensely bright seismically qualified nuclear underwater LED floodlight that reduces fuel handling costs by bringing daylight illumination to reactor cores, fuel transfer canals and storage pools. It has an integrated power source and is certified for use in water to 70°C without life reduction.

Our seismically qualified, UL listed emergency lighting fixture (BIRNS ELF-LED™) provides up to 40 hours of high intensity emergency illumination, with integral rechargeable batteries, low 35W power draw and a 50,000 hour lamp life.



The high performance, low maintenance BIRNS Quantum™ series of high and low bay lights delivers powerful illumination for safer, more comfortable and more efficient working conditions inside containment and throughout the plant. They come in a range of configurations, all with low power draws (53W-210W) and long lamp lives (60,000-100,000 hours) and high radiation tolerances.



**BIRNS®**  
High Performance...  
Under Pressure®

www.birns.com



BIRNS' Quality Management System is  
ISO 9001:2015 Certified;  
NRC 10CFR50, App. B Compliant

# Aerofin Celebrates 100 Years!

Founded in 1923, Aerofin is a leading manufacturer of finned tube heat exchanger coils and related heat transfer equipment. Servicing the nuclear industry since 1966, Aerofin's installed base of nuclear coils covers over 94% of US nuclear power plants and dozens more world-wide. Aerofin coils have been comprehensively LOCA tested at over 30 load points. With a resident ANI at their 165,000 sq-ft manufacturing facility in Lynchburg, VA, Aerofin can fabricate nearly any finned tube heat exchanger or other heat transfer product. Both spiral and plate fin coils can be designed for new applications or as drop-in replacements for existing equipment with the same geometry and performance as the original.

## Cooling Coils

Aerofin provides both pipe barrel and removable box headers as manifold options connecting to the finned tubes. The pipe barrel is simpler and more economical while the removable headers provide easy maintenance access for cleaning, inspection and plugging of tubes. Similar access can be provided on pipe barrel header coils through cleanable H-bends as well. The Split-Fit™ coil design is constructed in smaller sections to optimize replacement when accessibility to the coil area is limited. It offers a replacement for longer coils and the sections can be bolted together during installation.

## Other Products

Aerofin also offers fluid-to-fluid heat transfer options. Shell and tube heat exchangers are available including condensers and evaporators for chiller

applications. Circular coils provide batch heating and cooling solutions. Also available are ASME NPT stamped components and automatic backwash strainers providing continuous protection for downstream equipment.



**EXPERTS IN HEAT TRANSFER  
SINCE 1923—SERVICING THE  
NUCLEAR INDUSTRY FOR  
50+ YEARS**

Aerofin has been manufacturing products for the worldwide nuclear utility industry since 1966. For Fin-Tube Coils (plate or spiral fin options available), Shell & Tube Heat Exchangers, or Automatic Backwash Strainers, Aerofin is the most experienced and uniquely qualified source for safety related and non-safety related nuclear components.

## QUALIFICATIONS

- NUPIC Audited
- ASME AG-1 CONAGT
- ASME Section III (Class 2 & 3)
- ASME Section VIII
- 10 CFR 50 Appendix B
- 10 CFR 21 Reportability
- ASME NQA-1 / NCA-4000
- LOCA Performance Tested



4621 Murray Place • P.O. Box 10819 • Lynchburg, VA 24506

(434) 528-6218 • [www.aerofin.com](http://www.aerofin.com)

[nuclear@aerofin.com](mailto:nuclear@aerofin.com)



## For the most Tenacious Defense against Foreign Material and Dropped Objects:

Call  **ALPHASOURCE.**

### Custom-Manufactured FME Solutions of All Types and Sizes

Foreign material costs the International Power Industry billions of dollars each year in lost electrical generation, rework, equipment replacement/repair and manpower. As a response, Alphasource has been a provider of high quality engineered Foreign Material Exclusion (FME) control devices for the power industry for decades. Over the years our products have become the industry standard, and have been used extensively in power plants in the US & over 30 countries around the world, saving time, money, and other resources. All of our covers are certified to meet NFPA 701 Test Method 2 and NFPA 805 requirements, can be reused for years, and can be installed and removed in minutes without the use of tape, further reducing waste. For cost-effective methods to increase plant efficiency and maximize capacity factors, contact us today. Alphasource custom-manufactured covers can also be quickly designed for any project needs.

### ToolSaver Custom-Designed Drop Prevention Kits & RFID Asset Tracking Solutions

Dropped objects can pose multiple risks in the workplace, such as injuring an employee or damaging expensive equipment. Our ToolSaver line of Drop Prevention tools was created to help significantly reduce the occurrence of these costly events. By striving to find solutions and listening to customer feedback, our product lines are innovative, high quality, and field-proven. Importantly, our Drop Prevention tools are ISEA/ANSI 121-2018 certified. With a comprehensive product line of over 40 tool series, we are able to provide custom Drop Prevention solutions for anything from large mobile cabinets to small, portable, self-contained kits stocked with items for your specific project. Let our expert team design a solution for you.

Drop Prevention Cabinets and Kits:  
Designed for Professionals by Professionals



#### Special Features:

- Tinted Document Pouches & Windows
- U.V. Stable Fabrics
- Anti-Static
- High-Strength Rare Earth Magnets
- Custom Silk-Screen Printing

Call us Today! 215-844-6470 | [talk@alphasourceintl.com](mailto:talk@alphasourceintl.com)

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# Valcor: Designer and Manufacturer of High Quality Flow Control Devices

Valcor Engineering Corporation designs and manufactures valves for nuclear, aircraft, space, industrial, and scientific applications. Since 1951, Valcor's involvement with supplying components for difficult applications with high-pressure, flow, temperature, and vibration under extreme environmental/seismic conditions has been continually expanding. Today, Valcor manufactures over 100,000 solenoid valves and other fluid system components per year!

Valcor Engineering originally started out in the aircraft and space industries. Applications include both commercial aircraft and space components to major programs. We have also supplied hydraulic, fuel and pneumatic solenoid valves, APU shut-off valves, pressure and flow regulators, and pressure vessels for military programs including naval nuclear, fixed wing, rotary and unmanned aircraft.

In 1970, Valcor expanded and began designing and manufacturing high quality flow control components to the nuclear industry, with most activity centering on solenoid operated valves and regulators. Within Valcor, the Nuclear Group is structured as one of three integral corporate business units, which allows us to focus very clearly to develop, design and produce products for the nuclear industry worldwide, and be extremely responsive to individual customer needs. Our business is split approximately 50/50 between the domestic and international markets.

Most of our products are either ASME "N" stamped process valves for various fluids (including hydraulic fluid applications), or Class 1E air pilot valves for pneumatic actuators. There are also many special designs within our installed base of well over 15,000 "N" stamped units. Our products range in application from reactor coolant pressure boundary isolation to cryogenic, liquid sodium and marine (nuclear navy) services. These products generally are less than 4" NPS, and are used extensively in both domestic and international nuclear programs.

We have also signed license agreements and other supply arrangements with well-known former suppliers to the nuclear marketplace to manufacture and supply their unique nuclear product lines:

a. Hoke Inc. (Cresskill, NJ) for the supply of instrument isolation valves and manifolds

b. Circle Seal Controls (Corona, CA) for the supply of inline check valves and solenoid valves.

c. Fox Valve (E. Hanover, NJ) for the supply of cavitating venturis and eductors

These relationships have greatly expanded our supply capability beyond our traditional ASME Section solenoid valves.

In 2020, Valcor underwent a highly successful ASME re-certification audit for our "N", "NPT" and "NS" certification/stamps. We are excited that this

renewal now extends to welded piping systems, subassemblies, and component supports, and pressure vessels. This, in turn, opens significant new markets to us for the supply of complete systems, such as skid-mounted process packages requiring an extensive degree of installed instrumentation components.

For more information on our products and services, please visit [www.valcor.com](http://www.valcor.com), call us at (973) 467-8400 or email us at [nuclear@valcor.com](mailto:nuclear@valcor.com).



Valcor Engineering Corporation

Contact us to learn how Valcor can help meet your specific flow control needs  
[www.valcor.com](http://www.valcor.com) | (973)-467-8400 | [nuclear@valcor.com](mailto:nuclear@valcor.com)

## Contractor Data Management Drives Safety and Savings

Operating nuclear plants is daunting—from maintaining an aging infrastructure to managing contractor fatigue thresholds. The right digital automation tools can help nuclear plants reduce contractor data management complexity and maintain a safer job site.

For more than 30 years, Management Controls has helped global leaders take control of their contractor workforce. By delivering accuracy of contractor hours, safety, and productivity, you can control your budgets, ensure contract compliance, and save as much as 15% in overpayments.

Our Track® platform is used at over 300 industrial sites, processes over \$60 billion annually in contractor spend, and generates over \$5 billion in annual savings. real-time data, you'll connect what is happening on-site for a safer, more productive site.

### How the Track Platform Helps

Track captures badge-in/out events, calculates accurate electronic timesheets, digitizes contracts, and enforces terms and conditions so you have confidence you are paying contractors accurately.

With unprecedented visibility and real-time data, you'll connect what is happening on-site for a safer, more productive site.

With Track, you'll know every aspect of contractor labor, equipment, and materials on-site or off-site. Start making informed decisions and enforce contract terms with confidence.



## See What Industry Leaders Say About Track

"Without Track®, you are operating in the dark. With Track, you actually know what your contractors have earned, and you work with confidence that you are really paying for what you should be paying for."

**Fortune 500 Pulp & Paper Manufacturer,** *Vice President, Maintenance and Manufacturing*

"We've seen some really outstanding results. It's about being able to focus on safety and production first, removing the emotion of how people get paid."

**Fortune 100 Leader,** *Director of Technology & Analytics*

Learn more at  
[www.managementcontrols.com](http://www.managementcontrols.com)

## STOP PAYING WHAT YOUR VENDORS INVOICE YOU Start Paying What They Actually Earned

With Track, you can automate **Contractor Spend**:

- Centralized Hub for Contractor Spend
- Labor, Equipment and Material Tracking
- Daily Cost Visibility and Reporting
- Automated Contract Compliance
- Pay Rate and Skill Compliance
- Safety and Fatigue Management



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## Finally, an Alternative Supplier of Calibration Sources

### Failure is not an Option

A recurrent theme in the nuclear industry is to encourage no mistakes. We all know the importance of accuracy in science or classic phrases such as, *"measure twice, cut once"* would not exist. Metrology is everywhere, and in your line of work "close enough" doesn't cut it.

### Who We Are

RadQual is a wholly owned subsidiary of International Isotopes, Inc. (OTCQB: INIS) and specializes in the distribution of radioactive sources for various applications. Headquartered in Idaho Falls, ID USA, RadQual manufactures and distributes a wide range of calibration sources and radioactive standards used in fields such as nuclear energy, nuclear medicine and molecular imaging, radiation safety, research, and environmental monitoring.

RadQual has been in the sealed source market for more than 20 years. In that time we have shipped thousands of sealed sources worldwide. We have focused our efforts on not only producing quality products, but providing superior customer service and support.

### What We Provide

Top-quality products and calibration sources that meet the highest standards in the industry which are necessary in the pursuit of both accuracy and the avoidance of failure. RadQual utilizes NIST Standard Reference Materials (SRMs) and intercomparisons with NIST to ensure our calibrated products are accurate and traceable to NIST standards.

Recently, RadQual has teamed with the Radioactivity Standards Laboratory - Laboratoire d'Etalons d'Activité (LEA) in France. LEA is a subsidiary of the Orano Group and is France's largest manufacturer of radioactive sources. With the same commitment to quality as RadQual, LEA is accredited by COFRAC, France's accreditation body signatory with mutually recognized and equivalent traceability standards as NIST.

### What does this team relationship mean for you?

The full LEA product line is now available in North America exclusively through RadQual. With our combined history of high-quality manufacturing performance and products, we back all our products with a lifetime warranty against manufacturing defects.

If you care about scientific accuracy, then the precision of your equipment matters. Calibrate with certainty.

We are always happy to take your call and answer any questions you have. Call us at 208.524.5300 or email [sales@radqual.com](mailto:sales@radqual.com). Learn more about RadQual products at [radqual.com](http://radqual.com).

**Calibration Sources & Radioactive Standards**

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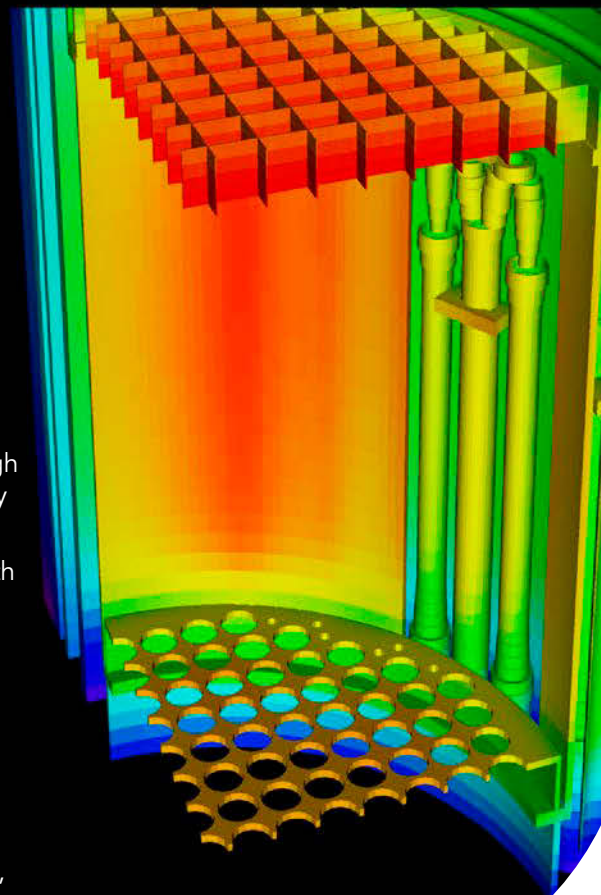


## TransWare Enterprises Inc. has the tools and expertise to help you meet your goals.

For over 35 years, TransWare Enterprises has helped our Clients navigate the ever-changing landscape in nuclear analysis through advancements in science and engineering to provide the quality results needed for reactor safety analysis.

Using time-tested solutions, our team of engineers collaborate with our clients to successfully implement their nuclear licensing needs and projects. TransWare Enterprises is founded in the challenges presented by the requirements for accurate and quality-related services that our industry needs to move forward with 80 years of licensed operation and beyond!

Recognized for our work in numerical methods, engineering analysis, and licensing support, TransWare Enterprises is an independent source of advanced methodologies in computational physics for the support of fuel depletion methods, particle transport, neutron fluence, dose, and used fuel storage services.



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Employment Opportunities are available with TransWare Enterprises for those Engineers whose passion is in the commercial Nuclear Power Industry.

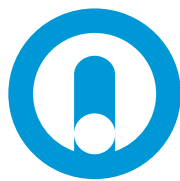
Many positions are now available in TransWare's Town and Country, Missouri corporate office. Full benefits package available.

### In Demand Titles

- Nuclear Engineers
- Used Fuels / Dry Cask Storage Engineers
- Front Office Staff
- Quick Books Expert

### In Demand Skills

- Fortran
- Linux
- Project Management
- Technical Writing
- Communication
- Initiative
- Experience
- Mechanical
- CAD Drawing



# ROS

REMOTE OCEAN SYSTEMS

A LEADER IN NUCLEAR INSPECTIONS

**REMOTE OCEAN SYSTEMS** is a leader in the design and manufacture of reliable, radiation-tolerant lighting and inspection systems for fuel pool and reactor visual inspections since 1975. Our product line includes rad hard cameras, high intensity pool lighting and high accuracy, robust pan & tilt positioners. Our cameras offer high resolution and high-definition output with optical zoom for close-up inspections. We offer both stationary pool lighting with LED or high-pressure sodium lamps plus LED drop lights. Our new CEX-HD Inspection System combines a high-definition camera with dual LED lights for brilliant, HD images and includes a compact, state-of-the-art IC-Link Controller that features system



*New compact design IC Link Control Box includes self-monitoring feature and connects to a USB Joystick for fast, easy and accurate camera control.*



diagnostic capability and links to a joystick for precise control over zoom, focus and exposure as well as control of lighting and camera operation. Remote Ocean Systems offers a fully staffed engineering department to help with your special inspection requirements.

## ROS Introduces Compact, High Resolution, High Rad IP-LINK™ Inspection System

The IP-LINK™ Inspection System is a compact, user-friendly design that features a high resolution 1080P PTZ GENII color camera and an IP-LINK™ controller that enables the user to control the underwater PTZ GENII camera as well as view inspection video.

**The new GENII 1080p HDTV PTZ Camera is lighter and smaller and allows easier maneuverability during nuclear pool inspections.**

The Joystick control enables fast, easy zoom, focus and exposure; dual light command functions. The controller has ethernet control/video streaming as well as control of the ROS PTZ GENII camera. Dose Rate 1 kR / hour.



**ROS**  
REMOTE OCEAN SYSTEMS

For more information on the IP-LINK™ System contact [sales@rosys.com](mailto:sales@rosys.com) or visit [www.rosys.com](http://www.rosys.com)



# BLACKSTARTECH

Resilient Solutions for Targeted Power, Lighting and Communications.  
Anytime. Anywhere.

**BlackStarTech®** provides reliable and resilient power, lighting, battery and broadband communication products that reinvent rapidly deployable emergency response and essential power delivery solutions. Our founders and engineers have decades of nuclear power experience that have been applied to successfully innovate, develop and implement targeted emergency and back-up uninterruptible power solutions that redefine FLEX response while also enhancing nuclear station PRA and 50.69 applications. **BlackStarTech** innovations even yield substantive productivity and cost savings for a wide variety of Outage and Maintenance applications.

In both postulated and beyond design basis scenarios, nuclear professionals may experience Extended Loss of AC Power (ELAP) situations or need immediate response power solutions to supply essential equipment that can be deployed in under 30 minutes and last for 30 days. **BlackStarTech's** innate beginnings centered on providing disaster and resiliency response solutions to the nuclear industry with capabilities that branch to many unique applications for Operations, Maintenance, Chemistry, Rad Protection, Emergency Planning, Outage Management and Security. **BlackStarTech** even provides unique Internet of Things (IoT) monitoring and automated robotic fire watch systems that integrate with our proprietary private LTE Broadband system, addressing facility interconnectability and solving your site communications, monitoring and automation requirements.



**BlackStarTech** solutions are specifically designed to provide immediate, dependable and even environmentally friendly carbon free power and lighting. By offering state-of-the-art energy delivery, lighting and communication deployment solutions with integrated remote IoT monitoring, **BlackStarTech** enables confidence in your emergency response and resiliency planning and yields significant cost savings for wide ranging applications for Operations and Maintenance, allowing stability and flexibility for our nuclear professionals.

**BlackStarTech** delivers solutions tailored to meet your specific situation... anytime... anywhere.





# BLACKSTARTECH®

Resilient Solutions for Targeted Power, Lighting and Communications.  
Anytime. Anywhere.



**BlackStarTech®** delivers innovative, rapidly deployable, backup solutions, including portable power, uninterruptible power supplies, private 4G/5G LTE communications networks and advanced lighting.

**BlackStarTech** components and systems can be deployed on-site in less than 30 minutes, with power supply lasting up to 30 days when leveraging the integrated long-term propane fuel backup option.

Power plants, nuclear stations, hospitals, industrial facilities, emergency responders, telecommunications and internet companies use **BlackStarTech** products to safeguard mission-critical applications when the unexpected happens.

**BlackStarTech** – portable, reliable, powerful backup solutions when you need to stay online and operational.

Nuclear | Utilities | Healthcare | Emergency Response | Industrial | Telecom

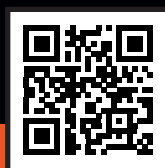


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## Energy Steel: Committed to the needs of the nuclear industry since 1982

Backed by 40 years of experience, Energy Steel supports nuclear equipment supply around the globe through high-quality products and OEM parts, engineering services, repairs, and on-site support.

We carry certifications in ASME N, NPT, NA, NS, U and NBIC R and NR, and we specialize in safety-related/ASME Section III products that span a wide range of sizes and applications.

### Heat Exchangers

Our extensive knowledge and experience includes custom design, repairs, and performance evaluation reporting. We can supply **Graham** heat exchangers.

### Pumps & Motors

We have expertise in sealed and sealless pumps and motors for the most complex nuclear applications. We can supply **Crane** (Deming and Barnes), **APV Gaulin**, **AJAX**, and **Servo Kinetics** (Vickers and Beach Russ).

### Greer Accumulators

We are the authorized manufacturer of Greer Bladder Accumulators – the most reliable on the market today. They improve system efficiency with dependable performance and service life.

### Valves

We offer commercial-grade, safety-related, and ASME Section III valves, including new and replacement units, for a wide range of nuclear applications. We can supply **Cooper Cameron** (WKM and Ringo) valves.

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From lube oil tanks to water separation tanks, we tackle all types of vessel projects at nuclear facilities.

### Structural Supports

We provide precision fabrication of structural supports of any size, including engineered solutions and build-to-print custom fabrication.

### Filters & Strainers

We offer a range of filters and strainers that protect your equipment, including Simplex, Duplex and Y Type. We can supply **Eaton** (Zurn and Hayward Industrial Products).

### Specialty Components

Our wide range of innovative solutions includes spent fuel canister components, custom valve bodies, straining elements, fasteners, and studs.

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We specialize in the refurbishment and replacement of obsolete parts, such as heat exchangers, pumps, valves and filters. We offer custom fabrication solutions, design services, performance evaluation reporting, design verification and re-rating.

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