

25th Annual Vendor/Contractor Profile Special Section

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EnCore® Fuel

We're changing nuclear energy...again.

Westinghouse EnCore® fuel is a game-changing accident-tolerant fuel solution that is intended to provide design-basis altering safety and significant economic benefits, as well as greater uranium efficiency.

As the leading supplier of nuclear fuel globally, Westinghouse has access to a world-class network of research, design and manufacturing partners. We are collaborating to deliver EnCore fuel on an aggressive, accelerated schedule.

Learn more about how Westinghouse EnCore fuel is changing nuclear energy at bit.ly/WestinghouseEnCoreFuel



Westinghouse
Electric Company



@WECNuclear



Westinghouse
Electric Company



wecchinanuclear

Westinghouse EnCore® Fuel:



Provides significantly **increased safety** margins in severe accident scenarios



The suite of EnCore fuel products offers **economic benefits**



Accelerated delivery **timeline**



Superior design provides enhanced **fuel cycle and plant economics**



World's **largest supplier** of nuclear fuel with world-class partner network

Enhancing Safety with Westinghouse EnCore Fuel

On Dec. 2, 1957, Westinghouse changed the world when Shippingport, the first commercial nuclear power station in the U.S., came online. Today, Westinghouse is changing nuclear energy again, building on our legacy of innovation with our revolutionary new accident-tolerant fuel design (ATF), EnCore fuel.

The EnCore fuel program will be delivered in two phases. The initial EnCore fuel product is comprised of coated cladding fuel rods loaded with ADOPT™ fuel pellets. The combination of this advanced rod coating with Westinghouse's proven ADOPT pellets can provide utilities with increased pellet uranium loading, improved fuel utilization, increased loss-of-coolant accident (LOCA) margins, enhanced debris fretting resistance and higher burnup.

The second phase of the EnCore fuel program features silicon-carbide (SiC) cladding and either uranium silicide (U_3Si_2), uranium

nitride (UN) or high thermal conductivity uranium dioxide (UO_2) pellets. This is intended to offer significant safety benefits in beyond-design-basis accident scenarios, enabled by SiC's extremely high melting point and the high thermal conductivity of the advanced fuels.

While current Westinghouse fuel designs have operated extremely well under normal plant conditions and design-basis accident scenarios, existing nuclear fuel designs can be challenged during beyond-design-basis severe-accident scenarios. In the event of such conditions, the long-term loss of coolant and the resulting high temperatures of the fuel can lead to the degradation of the fuel cladding and the early release of fission products. EnCore fuel is "game-changing" for the nuclear industry, significantly increasing safety margins in severe-accident scenarios. Additionally, EnCore fuel offers flexibility for fuel management

and provides a platform for utilities seeking higher rod burnup through higher enrichment.

Having fuel that maintains its integrity in severe-accident conditions? ***This changes nuclear energy ... again.***

The pursuit of accident-tolerant fuel is being carried out by an international, multidisciplinary, world-class network of research, design and manufacturing partners. Leveraging the breadth and depth of our resources, combined with U.S. Department of Energy awards, as well as utility funding, we are collaborating with respected industry partners to deliver EnCore fuel to the market. In the spring of 2019, we became one of the first companies to insert lead test rods with accident tolerant fuel manufactured into lead test assemblies into a commercial nuclear reactor.



Westinghouse



1527 N 2000 W, Ogden, UT 84404 • (801) 732-2000 – Phone • (801) 732-2098 – Fax • www.peterseninc.com

Petersen Inc. has been the industry leader in custom steel manufacturing for the nuclear industry for decades. How? By creating solutions to difficult problems and helping our customers meet their high demand project timelines and producing high quality products efficiently and in-budget.

HISTORY

Petersen Inc. of Ogden, Utah opened its doors in 1961 and has been manufacturing products for a variety of industries worldwide since that time. For over 55 years Petersen Inc. has been the company to go to when custom fabrication, design, engineering, and field installation are required for difficult projects. We have become the industry leader in the field of fabrication and precision machined components.

Petersen Inc. has been chosen as a partner in high-profile projects such as the Department of Energy's Hanford Waste Treatment Plant, Savannah River MOX facility, WIPP, Zion, West Valley, Kewaunee, APS, ORNL, LANL, LLNL, INL, and others.

The Petersen Inc. fabricated Melters are the heart of the Hanford Waste Treatment Plant which is the world's largest chemical radioactive waste treatment plant.



Up to 53-million gallons of radioactive waste is processed through the Melters.

Petersen Inc.'s participation in the Department of Energy's MOX Services project at the Savannah River Site is constructing storage components, gloveboxes, and other associated equipment for the facility which converts weapon grade plutonium into fuel for electricity generating power plants.

The Petersen Inc. involvement with Energy Solutions, NAC International, West Valley, Kewaunee, GEH and APS is in providing Dry Fuel Storage Casks and

transportation equipment, as well as custom equipment to support the Dry Fuel Storage requirements.

Petersen Inc. is a major supplier of containers for many industries including Nuclear, Oil & Gas, Aerospace and is proud to be a part of the clean-up of



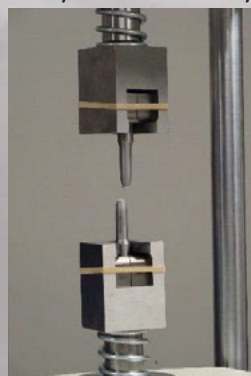
waste generator sites around the country, helping to make it a cleaner and safer environment for future generations. Petersen Inc. fabricates RLC's, SWB's, and TDOP's for Nuclear Waste Partnership LLC, (NWP) at the Department of Energy's WIPP site which allows us to provide storage containers of various sizes and specifications to anyone who purchases them through NWP.

CERTIFICATIONS

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

CGD In-house Test Lab

- Commercial grade dedication of material for nuclear applications
- Spectrographic chemical analysis of low alloy steels, stainless steels, nickel base alloys (includes nitrogen and oxygen determination)
- Rockwell hardness
- Certified penetrant, magnetic particle and visual examination
- Weld procedure testing
- Weld wire certification including welding of test coupons in accordance with filler material specifications



THERE IS NOTHING WE CAN'T BUILD

No matter the size, industry, or complexity, Petersen Inc. can handle any task. That's because we have over 1.3 million square feet of world class manufacturing, specialized fabrication, precision machining, field service, warehouse and distribution facilities filled with top of the line equipment and team members.



Gloveboxes



Casks



**Reactor
Services**



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Equipment**

Dry Fuel Storage Cask • IP Containers • Standard Waste Box • Standard Large Box • Glovebox
Process Equipment • Melters • Material Handling Equipment



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Can flexible operations be the key to achieving low-carbon energy generation?

The increase of solar and wind power in the energy mix is impacting overall electricity generation which is good in terms of reducing carbon. However, the variable output of these renewable sources creates challenges for utilities. Implementing operational flexibility for nuclear power plants through a variety of mechanisms is a viable solution. We asked two experts, one from Framatome and one from EDF, a few questions about flexible operations.

What is flexible operations?

Flexible operations is the ability of nuclear power plants to adjust core thermal power to match electrical demand and control frequency of the electrical system. Flexible operations is typically thought of in terms of four grid operating modes: daily load maneuvers, primary and secondary frequency control, response to unexpected grid upsets and extended low power operation.

How long has EDF been using flexible operations within its French fleet?

The EDF nuclear fleet has operated in flexible mode since the early 1980s. Nuclear generates about 75 percent of French electricity and has to adapt to periods of low consumption at night or on weekends. The fleet also provides a large part of the frequency regulation required by the grid operator. Thanks to grey control rods to level the flux shape in the core of the reactor, we reduce liquid waste

generation when the load varies, but load following is possible with black control rods. Every day, each reactor receives the load program for the day after, according to grid needs, consumption, renewable generation, and exports. Our reactors can make variations twice a day, going down to 20 percent of nominal power in only half an hour, and returning to full power at the same pace. Control room operators are trained to prepare and realize the load variations.

What is an example of successful flexible operations?

A successful load variation is made on schedule, in a safe manner, by monitoring core temperature, control rod positions, flux shape, chemistry, and waste generation. Some units, chosen for economic reasons, make about 100 load variations in a year, without any noticeable impact to safety and equipment reliability. Being flexible avoids using gas or coal to adjust the overall generation. It allows an electricity mix composed mainly of nuclear and renewable sources, with very low carbon emissions.

Is this a common way of operating the fleet in the U.S.?

No, but the drivers for flexible operations are changing in the U.S. Today, more and more U.S. utilities are either evaluating the transition to flexible operations or are actively pursuing implementation of flexible operations.

Why should a U.S. utility consider flexible operations?

A utility might consider implementing flexible operations for a myriad of reasons, but the most common are economics and carbon reduction efforts. In de-regulated markets where over-generation and transmission constraints can lead to negative prices, flexible operations can provide cost avoidance. A plant might also consider flexible operations to maximize use of non-carbon emitting sources and further lower its overall carbon footprint.

What should a utility consider when exploring flexible operations?

A utility must determine how flexible each nuclear generating asset needs to be. This will depend on the inherent design limits of the plant (e.g., allowable maneuvering rates), as well as the desired grid operating modes. Higher degrees of flexibility can result in greater implementation costs. For this reason, Framatome recommends that a feasibility study be performed which should evaluate the impact of flexible operations on all plant systems, structures, components and programs from the reactor core to the grid. This will provide a holistic assessment and avoid potentially costly surprises.

A utility must consider how soon it wants to implement flexible operations. If plant modifications are required, this could require a two- to four-year implementation schedule depending on the types of modifications.

Finally, a utility must choose an implementation partner. Choosing an implementation partner that has experience in flexible operations to perform feasibility studies, engineering evaluations and plant upgrades is critical. Framatome, with the decades of operating experience of the EDF fleet, is an ideal choice.





Quality

RSCC's quality assurance program starts with incoming raw materials and continues through the complete manufacture of our products.

We can provide full traceability of the raw materials, in process testing and final electrical test. Our Quality Assurance Program for Nuclear Products is in accordance with 10 CFR Appendix B and NQA-1 2014.

We are also ISO 9001-2008 certified.



Innovation

Our in-house R&D lab is continually examining and evaluating new materials to identify new opportunities for products. Our broad line of insulating and jacketing materials and engineering expertise allow us to provide virtually unlimited product options.



Qualified

All of our qualified cables meet or exceed all pertinent nuclear industry standards, including IEEE-383 and IEEE-323. Whether it's flame resistance postulated design base event (LOCA), thermal life projections, or other critical evaluations, our in house qualification test facilities continually perform simulated accident and accelerated long-term prototype tests to ensure product dependability.



Service

RSCC maintains the largest inventory of both low voltage and medium voltage single and multi-conductor products. Our entire inventory is fully documented and ready for immediate shipment.

Everyone working in the RSCC's Nuclear Segment are experts in their fields. This allows us to provide the highest level of service in the areas of Sales, Engineering, Quality and Production.

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Committed To The Nuclear Industry

For over fifty years, RSCC has supported the Nuclear Industry by providing a broad range of nuclear qualified cables to the industry. Our commitment to quality, innovation and range of products is unmatched.

No One But RSCC

Other Vendors Come and Go... Only RSCC Can Claim Continuous Market Support For Over 50 Years

- Full Support of Industry EPA, SLR, and Modification Needs
- Full Line - Nuclear Qualified Stock Supporting the Commercial Power And DOE Industry
- Experienced, Knowledgeable, Reliable Vendor
- Technical Leader



**The Time-Tested Cable Supplier
To The Nuclear Industry**



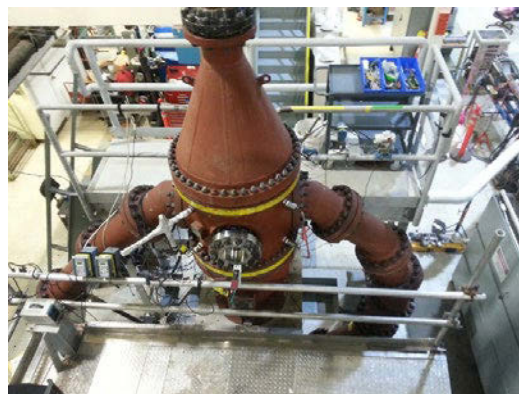
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AN UPDATE FROM CANADIAN NUCLEAR LABORATORIES: SUPPORT FOR REACTOR COMPETITIVENESS, SUSTAINABILITY, AND MODERNIZATION

Canadian Nuclear Laboratories (CNL) is dedicated to enhancing the competitiveness, sustainability, and modernization of both heavy and light water reactors. Through strategic investment in our capabilities and workforce, and through engagement with our customers, CNL is working harder than ever to bring our world-class services to utilities around the globe. We would like to take this opportunity to highlight a few of our recent projects.

CNL Research Contributes to Steam Generator Performance and Longevity

Steam generator (SG) performance and longevity are essential to sustainable reactor operations. In order to better understand what factors contribute to the degradation of SG tubing, the US Electric Power Research Institute (EPRI) looked to CNL for help. Using our unique facilities and expertise in vibration and thermalhydraulics, CNL designed and completed the first phase of an experiment to determine which conditions produce damaging levels of SG vibration. The results will enable the industry to establish clearer safety margins for both new and existing SG units.

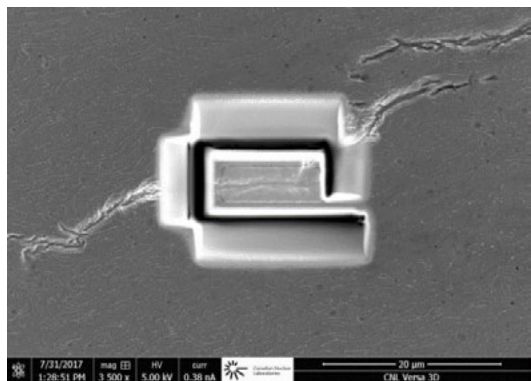


The multi-span U-bend test rig at CNL

Predicting the remaining service life of ex-service cables

CNL completed a study of low voltage cables removed from a reactor that had been operating for over thirty years in order to validate assumptions made as part of their initial Environmental Qualification (EQ) process and to predict their remaining service life. CNL researchers carefully selected cables based on environment, then assessed them through a series of mechanical and electrical integrity tests, supported by existing reference data. CNL researchers confirmed the validity of EQ service life estimates for the majority of cables, and also identified environments that had a significant impact on cable longevity. This study revealed a need to test additional cables from the same reactor, and a broader need to test cables at other reactors.

CNL continues to build its irradiated material analysis capabilities



A 10 micron sample milled along a crack by the FIB

Studying the microstructure of highly irradiated materials is valuable for identifying radiation damage and its impact on the material's mechanical properties and performance. To enhance our capabilities in this area, CNL commissioned a Thermo Scientific Versa 3D dual beam focused ion beam (FIB), and a JEOL F-200 Transmission Electron Microscope (TEM). In combination, these facilities allow CNL researchers to extract micro-specimens from materials of interest, transport them easily between laboratories, and perform high resolution analysis of their microstructure. We are excited to leverage this equipment to expand our

capabilities and bring added value to our customers and partners.

This is just a small sample of CNL's recent work. For more information on all of the exciting projects taking place at CNL, please email commercial@cnl.ca for a copy of our annual report!



Canadian Nuclear
Laboratories

Laboratoires Nucléaires
Canadiens

Maximize Performance & Profitability with a Superior Tube Plugging Solution

There are quite a few options when the need arises to plug a tube in a heat exchanger. Whether the reason is preventive or due to a major leak, selecting the wrong plug could lead to costly ramifications down the road. A failed or leaking tube plug at the very least can cause chemistry headaches. Out of specification water chemistry needs to be addressed and the long-term effects of compensating for even a small leak can add up financially over time, by either the cost of added chemicals or premature corrosion of equipment or piping. Larger leaks have a much quicker impact on performance, as the unit will most likely need to be shut down for a period of time while repairs are made.

Pop-A-Plug® Tube Plugs were designed with these factors in mind to prevent costly maintenance and/or downtime caused by leaking and/or failed heat exchanger tubes. Leak tested up to 7000 PsiG depending on plug selection, Pop-A-Plug Tube Plugs are a permanent leak-tight solution for use in a variety of heat exchangers. The plugs meet ASME PCC-2* recommendations and EPRI** criteria.

Non-metallic plugs such as elastomer and polymer are often used as a quick or temporary fix for leaking tubes. More recently, however, the industry has been shifting to the understanding that these plugs are only a temporary solution. The material can harden over time and lose the ability to seal effectively. In addition, any excursion that may cause the tubes to pressurize will tend to eject the plugs, nullifying the reason for plugging to begin with. Some permanent metallic plugs, also known as tapered pins, hammer-in or welded plugs can damage the tube and tubesheet when installing or cannot be removed once installed. In these cases, the tube is condemned and cannot be reclaimed if future testing determines the tube is still functional.

In addition to maintaining a leak-tight seal throughout the life of the unit, Pop-A-Plug Tube Plugs may also be removed, causing no damage to the tube itself. Pop-A-Plug Tube Plugs are available in a wide variety of materials to match the metallurgy of installed tubes. As a result, there is no concern over dissimilar metals

or premature corrosion failure from using the wrong type of plug. Additionally, there is no welding required, minimizing the time to install and the amount of potential exposure to personnel.

With an increased focus on maintaining plant chemistry and minimizing downtime, the industry is taking a closer look at potential risk factors to that strategy. This is where Pop-A-Plug Tube Plugs excel and can take the guesswork out of tube plugging, and help keep the plant running at peak performance.

For more information, visit cw-estgroup.com. Contact us at est-sales@curtisswright.com or call 877.238.3092 to speak with one of EST Group's Product Experts today!

* Inspection and Repair of Shell and Tube Heat Exchangers, The American Society of Mechanical Engineers (ASME) PCC-2, Article 312.

** Condenser In-Leakage Guideline, Electric Power Research Institute (EPRI), Palo Alto, CA, 2000, TR-112819 Page 7.

Pop-A-Plug® Tube Plugging System

Eliminate Forced Outages

As the industry's leading engineered tube leak solution, **Pop-A-Plug Tube Plugs** from Curtiss-Wright provide unmatched performance in critical heat transfer equipment, including feedwater heaters and condensers. Trusted by nuclear power plants around the world, Pop-A-Plug Tube Plugs meet all guidelines contained in EPRI's Condenser In-Leakage Report, and conform to ASME PCC-2 recommended tube plugging repair methods. Full material traceability documentation available.

With nearly a century of engineering excellence behind them, Pop-A-Plug Tube Plugs provide unmatched reliability for maximum HX system performance.

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A Better Way to Manage Discovery Work

BHI Energy

We've all been there. In prepping for the next outage, the site identifies a project that has the potential for expanded scope based on as-found conditions. From the information available, a 10-day scope is budgeted, and the subsequent tasks are planned accordingly. The only thing is, you will not know the extent of repairs required until your mechanical window opens in outage.

When Plant Engineering gets its first as-found data, it's discovered there's actually a 100% increase of scope, blowing up the work schedule and possibly doubling the mobilized contingency. The only way an owner can mitigate risk is to rely on contractors to minimize the impact of those discovery tasks and keep the outage schedule on track.



Here's where a specialty contractor like BHI makes a high impact because, with strong specialty capabilities and the ability to integrate craft for a complete scope offering, the company ensures nothing is missed in our effort; whether our delivery method is welding-specific, task managed activities or full craft implementation. As Subject Matter Experts for most welding and mechanical repairs in the nuclear power plant,

BHI has more experience handling these types of issues. Our experience and Lessons Learned assists plants in first time iteration projects and emergent scopes.

So are all specialty contractors the same? BHI has a proven track record of delivering critical projects based on a strong project management approach. This approach blends top project management, site management, field leadership, craft and technology to tackle the toughest outage projects safely and with first-time quality. This approach delivers the highest productivity per dollar of any contractor within the industry.

Our productivity is well documented by our customers. A recent study by one of the nation's largest industries listed BHI's "time on tools" at an unrivaled 80 percent (the next closest vendor was 50 percent). Lean, talented crews coupled with high productivity and automated tooling maximizes value for our customers.

Managing risk during discovery, however, is where BHI truly shines. Leaning on our robust internal operations, we can leverage strong project management, field labor management, national union agreements, engineering and equipment maintenance teams to mobilize additional personnel, technology, equipment and support resources to tackle the most challenging discovery scopes. In fact, BHI is the contractor of choice to be on-site for planned projects as an insurance policy against critical discovery items that put outages at great risk.

The lynchpin of our delivery model is our site leadership. At BHI Energy's Center of Excellence, regular training is provided to our site personnel to arm them with the tools required to serve our customers most effectively. This begins with our standard welding processes and extends to advanced automated technology. Additionally, leadership training for our site managers is a great differentiator. This training focuses on communication, financial oversight, scheduling, project organization and human resource management.



The final result is BHI's capability to take on all types of projects, from general mechanical services to highly automated specialty mechanical services.

Engaging a contractor with the skills to perform critical projects — both planned and emergent, general and specialty, manual and automated, maintenance and capital — is a smart move for outage management. BHI delivers successful projects.

For more information,
visit www.bhienergy.com.



Years of Solutions | 1979 - 2019

Contact us today to make BHI part of your solution.

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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 8,000 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 workforce 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
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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@brokkinc.com



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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.



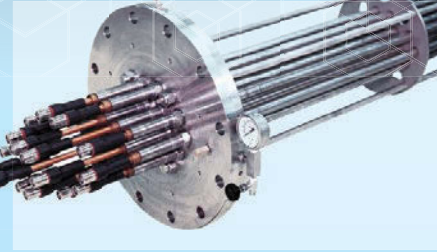
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SAFETY FIRST, SECOND TO NONE.

A new energy future is here, and NuScale is leading the charge for a brighter, cleaner, safer tomorrow. We are fully committed to innovative and advanced safety features and to producing more resilient energy.

With partnerships like the one with Ultra Electronics Energy, we are able to introduce advancements such as a new digital display system using Field Programmable Gate Array (FPGA) technology. FPGA powers a series of dedicated displays showing critical plant safety data in high resolution, high fidelity graphics for each of NuScale's 12 power modules. This is the first time the application of FPGA technology will be used for real-time display and monitoring in the US commercial nuclear industry. These innovations allow for simpler, more efficient and predictable design, since the safety display and indication system show plant data without using microprocessors, operating systems, or software in the runtime environment. It also means a greatly reduced cyber-attack risk. All of this, results in a more predictable and efficient safety justification process. This is just one of the many ways in which NuScale is leading the way in safety innovation for all humankind.

Safer energy is our future. We think about safety so you don't have to.

NuScale has developed the new standard for rigorously proven safety. We call it the Triple Crown for Nuclear Power Safety™. This industry-leading protocol allows us to safely shut down and self-cool our NuScale Power Module™(NPM) indefinitely with no operator or computer action, no AC/DC power, and no additional water.

7 Layers of Defense

In addition to NuScale's many innovative gravity-driven and electricity-free safety features, we incorporate seven-layers of defense that provides unmatched protection against potential threats to people and the environment. We take our environmental stewardship, and safety, to the extreme.

Proven Technology

NuScale has taken on a safety-first approach across all steps of our design process. We utilize a below-grade, steel reinforced, stainless steel-lined concrete pool to safeguard the NPM in the event of seismic activity. Each pool also contains enough water to safely remove the NPM's core decay heat for an unlimited period of time following a complete loss of power to the station without having to add water.

A Resounding Step Forward In Resiliency

World class resiliency. The most resilient nuclear reactor in history, as proven by a groundbreaking three-year research study that showed NuScale's plant design provides unmatched resiliency.

NuScale is building small modular reactors that are ready for uncertainty. Ready for emergencies. Ready to be first responders. Ready for constant change the future might bring.

In fact, NuScale power plants are designed for reactors to remain in operation to power the electric needs of the facility in the event of loss of the electric grid.

As well as survive natural disasters and extreme events greater than Fukushima. This design can even withstand aircraft impacts.

It's important to secure the future. Only through unmatched resiliency can we power through it. NuScale plants are the optimal solution to deliver highly reliable power.

To learn more in depth about these numerous safety advances, please visit nuscalepower.com.



GROUNDBREAKING SAFETY BY DESIGN

We think about safety, so you don't have to. NuScale's Small Modular Reactor (SMR) technology is engineered with tested and proven power-free, gravity-driven safety systems that eliminate human and mechanical error as well as reduces the threat of climate, cyber or physical hazards. It's a world-first in nuclear design, and NuScale is the only developer to achieve it. We call it future-proof design, and it's one of the many ways we're changing the power that changes the world. nuscalepower.com





Over 40 Continuous Years as a Nuclear Safety Related Fabricator & Installer

SSM Industries, Inc. (formerly Schneider Sheet Metal) is the largest Safety Related HVAC designer / fabricator / supplier / installer in the United States. SSM entered the nuclear industry over forty (40) years ago as the metal fabrication division of Schneider Power.

Based in Pittsburgh, the Power Division of SSM Industries Inc. provides design, qualification, fabrication, and installation support to utilities in today's nuclear market for both safety related and non-safety related HVAC ductwork, dampers (tornado, bubbletight, balancing, manual, fire/smoke), fans, VFD's, louvers, skid units, etc. We have supplied equipment to virtually every Commercial Nuclear plant in the United States, as well as Nuclear Plants worldwide.

Starting in the 1970's, SSM has performed complete HVAC duct fabrication and installation at 7 nuclear new builds, and this continues at Vogtle 3 & 4. SSM is performing the complete HVAC fabrication and installation of duct, dampers, and standalone fans.

Together with Westinghouse we designed the AP1000 Containment Building HVAC Duct and Supports system and VCS containment fans.

The industries we serve include Commercial Nuclear Power Plants, DOE EM Facilities, and critical mission research facilities and laboratories.

We can supply new equipment, replacement parts, spare parts – if it's related to HVAC and air movement we can support your needs.

SSM maintains a complete 10CFR50/NQA-1 (including all Supplements) Quality Assurance Program. SSM is listed in the NUPIC data base 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.

Give us the opportunity to be a part of your next project and we'll help you stay on budget and on time.

SSM INDUSTRIES, INC.
3401 Grand Avenue
Pittsburgh, PA 15255
Phone: (412)-777-5101
www.ssmi.biz

Over 40 Years of Nuclear HVAC Experience

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

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

HVAC SYSTEM COMPONENTS

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

QUALITY CERTIFICATIONS

NQA-1
ASME AG-1
10CFR50
Appendix B
ASME
AWS



For more information contact the SSM Power Division at (412) 777-5101 or visit us at www.ssmi.biz to learn how our experience can benefit your next project.

(412) 777-5101 • ssmi.biz



— Rolls-Royce offers leading-edge technology and intelligence on a nuclear scale.

Reduce your outage maintenance burden with our remote robotic solutions and high-powered data analytics.

Our unique pool of performance data – gathered from nearly half the world's nuclear reactors – targets and right-sizes your outage, so you can maximize the reliability of your equipment while reducing the cost, risk and dose.

Plus, our state-of-the-art robots, video probes and Remote Operated Vehicles remove time-consuming activities from critical path.

rolls-royce.com

steven.hetzel@rolls-roycenuclear.com

Tel: Steve Hetzel 256/527-6021



HELPING CUSTOMERS GENERATE MORE POWER FOR LONGER

We help our customers find new ways to generate more power for longer, creating a lasting competitive edge with which they can face the world's low carbon electricity demands of the future.

Our intelligent approach is to invite them to collaborate with us to develop long-term relationships so we can use their data to create intelligence that can generate lifetime savings, making the operation of their nuclear power stations more efficient, simpler and easier.

Our expertise spans data analytics and world-leading instrumentation and control systems, to engineering design and site support services like robotic inspections. This equips power station operators with the essential tools they need to face the current cost and reliability challenges, as well as positioning them as strongly as possible for the future.

Turning data analysis into operational intelligence creates value

We break through barriers to greater operational reliability and efficiency by collaborating with customers to analyze, diagnose and optimize their operations, using cutting edge predictive data techniques.

By combining our unique data resources with our world-class engineering design and services, the insights we create bring lifetime savings and bring existing nuclear power stations into a new, intelligent age.

Predicting maintenance, managing obsolescence

From maintenance optimization to obsolescence management, our tried and tested technology brings new clarity and insights to how operational availability and efficiency can be improved; new ways to optimize asset management; and innovation to manage the complex and dispersed supply chain to secure best value for our customers.

And this is just the start. Our vision for bringing our intelligent approach to our customers will transform how clearly they see new savings and efficiencies in their operations.

Almost half the world's reactors rely on our systems

Rolls-Royce has a 50-year heritage in supplying critical safety control and instrumentation systems, back-up power generation, and more recently heat exchangers and waste treatment systems.

We're also one of the only end-to-end in-house suppliers in the world for back-up diesel generators, using the full scope of the Rolls-Royce Group to design systems, manufacture and supply equipment with full I&C integration. Among the many systems projects we're currently supplying OEM long-term I&C support solutions to all 58 EDF reactors in France; performing Safety I&C modernization for 20 French 1300MW reactors; delivering rod control, neutron instrumentation and pressure transmitters to all CPR1000 reactors in China; as well as heat exchangers to Hinkley Point C in the UK.

Value from integrated services for a lifetime partnership

Focusing on efficiency and cost reduction across the lifetime of nuclear power stations, we provide integrated through-life engineering design and site support services that span the latest capabilities in physical, systems and cyber security strategy, to plant process computer systems; remote inspections and non-destructive testing; component design, small component manufacture; supply chain integration and commercial grade dedication.

rolls-royce.com

Helping Clients Secure the Future of Nuclear Power

Nuclear power has been a core business of Sargent & Lundy since 1954, with proven capabilities in engineering design, analysis, compliance, project management, and more. Our leading-edge services address today's emerging issues with cost-effective solutions.

Clients confidently rely on our technical depth and industry-wide experience for the critical input to make long-range strategic and corporate decisions. Owners enlist our support as their engineer-of-choice and rely on our expertise for specialized problem solving.

We are trusted throughout the industry, currently supporting more than 100 nuclear units across North America and nuclear clients worldwide.

Our solutions encompass all vital areas of nuclear power, including:

- Post-Fukushima safety enhancements
- Open-phase solutions
- Cyber security
- Digital control system upgrades
- Implementing NFPA 805 solutions
- New plant projects from inception through operation

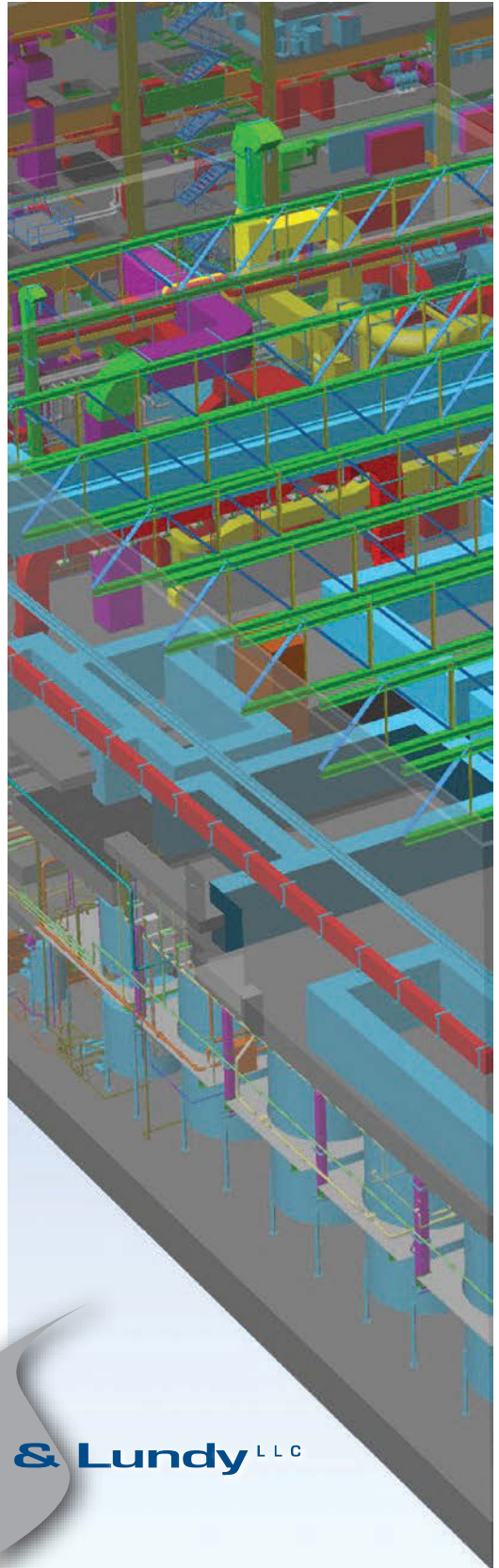
That's in addition to our extensive support for the many on-going initiatives and O&M programs that effectively address nuclear plant requirements for continued safe, reliable, and economical operation.

To discuss your needs, contact Tom Behringer, Senior VP, at 312-269-6893

Sargent & Lundy ^{LLC}

55 East Monroe Street • Chicago, IL 60603-5780 USA • 312-269-2000

www.sargentlundy.com





SPECIAL ADVERTISING SECTION

F&J SPECIALTY PRODUCTS, INC.

The Nucleus of Quality Air Monitoring Programs

Company Profile

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 combines advances in hardware and software technologies to simplify the data collection 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.



World Class Instruments!



MEGA High Volume Air Sampler



Light Weight Low Volume Air Samplers



ULTRA High Volume CTBTO Air Sampler



World Calibrator

F&J SPECIALTY PRODUCTS, INC.

The Nucleus of Quality Air Monitoring Programs

F&J Advanced-Technology Instruments



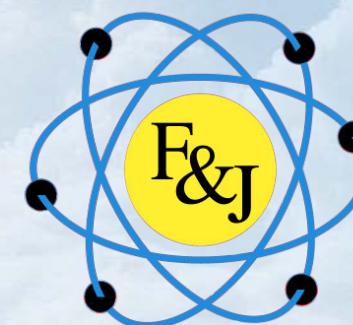
WC-VFD
World Calibrator



DF-40L-400
Emergency Response Air Sampler



GAS-60810DT Series
Ambient Air Monitoring System



GAS-22
Low Volume REMPA Air Sampler System



Filter Media
MCE Membrane Assortment, Glass Fiber, Qualitative and Quantitative Media



Radioiodine Collection Filter Cartridges

Tel: 352.680.1177 / Fax: 352.680.1454 / fandj@fjspecialty.com / www.fjspecialty.com

Storage, Transportation, Fuel Cycle Expertise

Helping Nuclear Energy to Go the Distance

For over 50 years, NAC International (NAC) has been a trusted partner to the nuclear energy sector worldwide. From designing, delivering and loading storage and transportation systems to providing expert consulting services, NAC helps

assure that the nuclear energy industry continues to meet its vital role for decades to come.

STORAGE ASSURED

NAC has developed and deployed three leading transportable storage cask systems for commercial spent nuclear fuel and supplies this

technology to nuclear sites.

- MAGNASTOR® is a proven, dual-purpose spent fuel system and the first ultra-high capacity storage system of its kind deployed. Other NAC designs include UMS and MPC systems.
- Fulfilling orders for nearly 700 spent fuel storage systems.
- Decades of decommissioning experience; six U.S. nuclear plants complete and one ongoing
- Member of Interim Storage Partners, Inc. developing Consolidated Interim Storage facility in Andrews, Texas.

TRANSPORTATION ASSURED

NAC offers end-to-end solutions for nuclear material packaging and transportation. Our proven team of cask operators and field engineers relocate and manage nuclear materials worldwide.

- 3,700 shipments, covering over seven million miles
- NAC-owned cask systems incorporate unique features, based on operating experience in 30+ countries.
- OPTIMUS cask line offers an adaptable Type B cask package designed to cost-effectively ship a wide range of fissile material.

EXPERTISE ASSURED

NAC provides the most prestigious nuclear organizations with expert consulting and training services.

- Nuclear material consulting services to support strategic decisions of companies and government agencies
- Nuclear quality services including fuel fabrication, performance, and inspection
- Specialized software solutions for nuclear material control and accountability (MC&A)



TRUSTED PARTNER FOR FUEL CYCLE MANAGEMENT

NAC International Inc. (NAC) has been a trusted partner for fuel cycle management solutions and consulting for **over 50 years**.

NAC serves more than 200 customers, including the world's leading nuclear organizations, and supports a host of diverse projects around the globe.



CONTACT US:

George Vaughan, Vice President, Business Development

T: 678.328.1222 | C: 404.755.5045 | gvaughan@nacintl.com

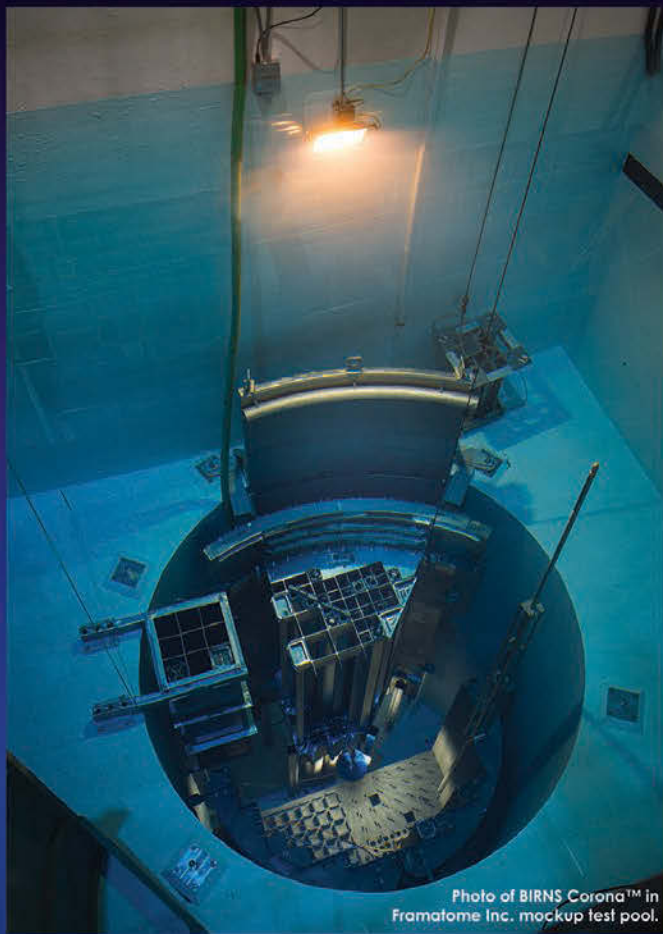


Photo of BIRNS Corona™ in Framatome Inc. mockup test pool.



Nuclear Lighting That Stands the Test of Time

BIRNS, Inc. has proudly been serving the nuclear power industry with high performance lighting solutions since 1977. Since then, the company has contributed to the advancement of industry technology for fuel and reactor pool lights, drop lights, seismically qualified emergency lights and high bay lights.

Our Quality Management System is ISO 9001:2015 certified, and complies with the requirements of NRC 10CFR50 App. B. Our products are custom engineered, precision manufactured in the U.S.A. and are stringently tested to exceed the requirements of our nuclear customers worldwide.

We're proud that our lights have been trusted to provide long term use and brilliant output for the past four decades, and we look forward to an equally bright future.



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



www.birns.com



Over 95 years of combined experience, dedication, and expertise to the nuclear industry.

Hayward Tyler and Energy Steel combine to offer a broad range of products and services to the nuclear industry. As an integrated solution provider, we are committed to the quality and service the industry demands. Together, we offer pumps, specialty motors, tanks, heat exchangers, strainers, custom fabrications, and related parts.

Equipment Obsolescence

Equipment obsolescence is a challenging problem for nuclear plants domestically and internationally. We have multiple solutions for replacing a nuclear plant component that is no longer commercially available and there is no off-the-shelf qualified replacement.

Commercial Grade Dedication

Our Commercial Grade Dedication program provides us flexibility in supplying difficult-to-source parts and materials, providing bottom-line value to our customers to resolve supply chain obsolescence issues.

Reverse Engineering

Our inspection and engineering teams work together to capture the critical characteristics of your existing component. We can then supply a replacement or upgraded design to provide improved performance.

Equipment Replacement

To help sites mitigate obsolescence issues, we supply OEM replacement equipment as well as non-OEM equipment. This can be a direct replacement or as upgrades to an existing design. Our design engineers work directly with your site team to develop the most cost-effective solution.

Upgrades and Repairs

We provide equipment repairs, both onsite or in-house, and can provide design upgrades to increase reliability, serviceability, and overall performance. For pumps and motors, we can offer re-rates, material upgrades, or modifications to the existing design features.

Root Cause Analysis

Our team of dedicated engineers can analyze your pump, motor, vessel or system, and provide a Root Cause Analysis to address the “why” — not just the “what”. We have extensive experience in examining worn or failed components to identify problems and determine how to fix them. We have the field experience, combined with engineering design knowledge, to properly analyze complex issues and offer practical solutions.

Engineering Services

Our engineering teams offer a wide range of services, including computer analysis (FEA, CFD, Spectral Analysis, etc.), specification writing, and code year reconciliation. Together with our field service and testing staff, we're able to provide comprehensive diagnosis of issues and solutions.

Safety-Related Equipment

We can supply ASME Section III, Division 1, Class 1, 2 or 3 equipment, including those deemed “Safety-Related” per U.S. NRC requirements. We offer services associated with re-classifying equipment, as well as all necessary engineering services that support “Safety-Related” equipment.

Field Service and Testing

We provide on-site performance testing, including vibration, flow measurement, motor testing, and thermal imaging. This can be used as a regular health check or to diagnose a specific issue. In addition, we offer a variety of field services, including installation and removal of equipment, laser alignment, commissioning, on-site overhaul or repair, and full turn-key service.

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HAYWARD TYLER

Dedicated OEM. Committed to Nuclear.



HAYWARD TYLER

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PUMPS | SPECIALTY MOTORS | ENGINEERING SERVICES | HEAT EXCHANGERS | TANKS | FABRICATION



POWERED BY HIGHER STANDARDS

We are pleased to announce Wachs Services has been acquired by Aecon Group. Wachs Services, well known to be a leader in specialized welding, machining, metal fabrication, equipment and staff augmentation to the nuclear power generation industry – will be known as Aecon-Wachs.

Aecon Group, is a Canadian leader in construction and infrastructure development with a thriving Nuclear division that provides a full spectrum of Engineering, Procurement & Construction (EPC), maintenance and manufacturing services specifically tailored to meet the demanding requirements of the nuclear power industry. In addition to its exemplary safety record, Wachs closely aligns with Aecon's core values, reflecting a commitment and drive for quality, teamwork, accountability, professionalism and integrity.

Under its new banner, Aecon-Wachs will continue to maintain its NUPIC member and NIAC member audited 10CFR50, Appendix B program, along with ASME and ISO 9001 quality programs.

Keith Willingham, former President/Owner of Wachs Services, will serve as Vice President, General Manager (VPGM) of Aecon-Wachs and will report to Sean Sexstone, Senior Vice President, Aecon Nuclear. With more than 35 years of construction and project management experience, Keith has held numerous leadership

positions within the power industry, including President of SGT (Steam Generator Team), where he achieved distinguished awards for Safety and Quality as well as records for Schedule and Cost reduction at some of the nuclear industries most challenging projects.

"Aecon has been a valued client of Wachs for many years," notes Keith. "Whether utilizing our staff augmentation division, welding and machining services or carrying out contract-to-hire at the Executive level, Aecon has always appreciated the value of Wachs employees. As Aecon was embarking on nearly \$1 billion in nuclear projects, its leadership team recognized the opportunity to become even stronger in mechanical construction and decommissioning."

"The subsequent acquisition of Wachs by Aecon now gives us the ability to not only strengthen our core competencies but to finance expansion into larger opportunities, including turnkey capital projects, fleet contracts, design engineering, complex module fabrications, welding and machining R&D, and much more. Aecon's leadership is second to none. I look forward working with them as we grow Aecon-Wachs in the U.S. and International markets."

The recent acquisition also provides an impressive complement to Wachs' already existing nuclear power industry capabilities. Aecon-Wachs is now positioned to offer our clients the cumulative expertise and benefits that come with more than a quarter-century of in-depth experience delivering nuclear

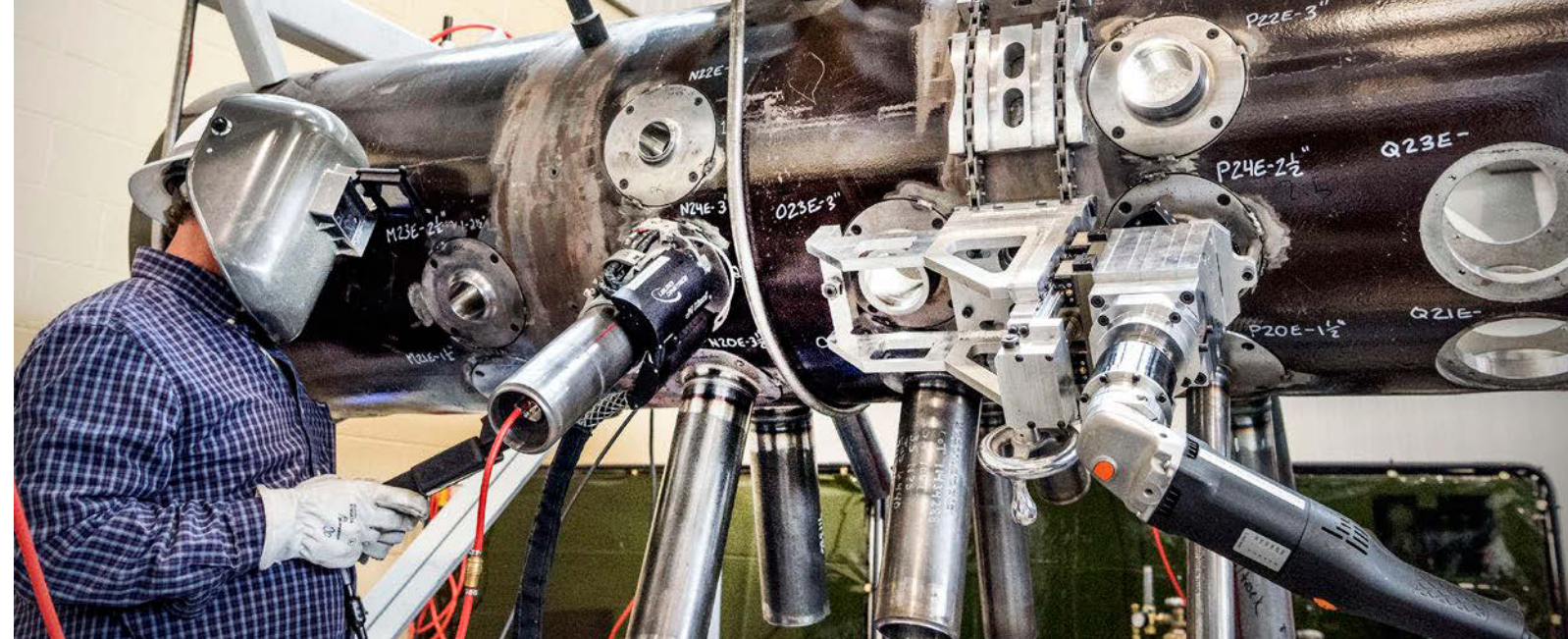
projects safely, on-time and within budget. Highlights have included a key role as pioneers in nuclear decommissioning during the 1990s, developers of world-class welding/machining practices on steam generators and boilers during the 2000s, and leaders in new-build nuclear construction throughout the development of the U.S.-based Westinghouse AP1000.

Utilizing state-of-the-art welding, machining and fabrication knowledge, Aecon-Wachs is well suited to helping clients meet the demands of planned and unplanned outages, managed tasks and major component replacements or repairs. As a complement to its core competency in field services, Aecon-Wachs offers a 120,000 ft² fabrication facility in Aiken County, SC specializing in pipe fabrication, pipe bending, steel cutting, structural and pressure boundary fabrications. Aecon-Wachs also has the unique ability to perform design engineering, modular fabrication, field installation as a Prime Contractor or serve as the sub-contractor or partner to a larger EPC.

We're pleased to confirm that under our new Aecon-Wachs banner, our company will operate in much the same way, maintaining Union and Non-Union divisions. We look forward to continuing to support our client's needs and fostering our valued partnerships.

Please note the following changes to our operating division names moving forward:

- **Aecon-Wachs Technical Services**
- **Aecon-Wachs Industrial Services**
- **Aecon Industrial Resources Staffing (AIRS)**



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)

2016 – 0.57	2017 – 0.55	2018 – 0.53
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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



system|one

exceptional talent. specialized solutions.

SPECIALIZED NUCLEAR STAFFING AND WORKFORCE SOLUTIONS

For over 40 years, System One has provided nuclear power utilities, the Departments of Defense and Energy, OEMs, EPCs, and other energy utility providers with workforce solutions and integrated services. We have achieved consistent year-over-year growth and market share increase in our energy and engineering businesses. We continue to expand our presence within the commercial nuclear power sector delivering custom workforce programs, including emerging NDE technologies.



Delivering Quality Solutions Our Nuclear Partners Can Depend On

Workforce Solutions

From traditional staffing and managed staffing programs (MSP) to recruitment process outsourcing (RPO) and vendor management systems (VMS), we are experts in delivering highly-skilled energy and engineering talent.

System One's dedicated "nuke squad" delivers resources and programs that address the nuclear industry's unique workforce challenges:

- **Contract and direct hire staffing** across all nuclear plant and national laboratory specialty areas, including positions requiring secret and top secret level security clearances.
- **Customized workforce solutions** leveraging our MSP and RPO solutions.
- **VMS staffing** using our proprietary technology platform to simplify the requisition process, deliver specialized talent, and efficiently facilitate communications between all stakeholders.

Integrated Services

We design and deploy outsourced programs that address business challenges unique to nuclear facilities, giving you access to multidisciplinary best practices – all through a single source:

- **Advanced NDE and Testing** delivered through a full set of QC and NDE services supporting the commercial nuclear fleet. System One has a long history of providing UT/MT/PT/ VT and Welding inspection services, including PAUT and computer-aided RT services in support of client nuclear inspection programs. We have an exclusive partnership with Evisive, LLC. to employ EvisiveScan's™ volumetric microwave inspection technology for dielectric materials such as REJs, HDPE, and fiberglass.
- **Technical Training** at the System One Technical Training Center provides NDE and Pipeline Inspection instruction to prepare individuals for working in energy, power, industrial, and technical facilities.
- **Transmission & Distribution Services** provide management resources for construction and capital projects, including: smart meter installation, smart grid integration services, project scheduling, and project controls.

Let System One take the guesswork out of your project resource needs. Learn more at systemone.com.

PREMIER TECHNOLOGY, INC.

Who We Are.

Premier Technology, Inc. is a vertically integrated supplier of custom fabricated equipment with experience in both government and commercial sectors. Premier has successfully executed contracts with utilities and prime contractors across the United States and globally.

Premier's products and services reflect the highest quality by consistently innovating and improving design and engineering applications customized for client specific applications. We have a 20 year history of outstanding performance on challenging projects of all sizes and complexity in support of the national and global nuclear industry.

Operating as a small business, Premier can perform any of its services as a sole source or as a contributing team member. Premier possess extensive knowledge and practice in on-time delivery, critical path scheduling, and subcontractor and labor management. With appropriate resources in place, Premier is well positioned to maintain contract budgets and schedules for on-schedule project delivery.

Complete integration of all services housed at Premier is a defining factor in avoiding or solving common project bottlenecks and pitfalls efficiently. This minimizes scheduling issues and reduces negative impacts to project

based budgets. All of these measures help each division deliver the final product while adhering to our guiding principles of safety, quality, schedule, and cost.

Premier offers the following specific core competencies and capabilities for work performed in the nuclear sector:

- Engineering and Design
- Fabrication and Machining
- Commercial Grade Dedication
- Nondestructive Examination
- Instrumentation and Controls
- Integration
- Testing
- High Capacity Load Testing
- Industrial Coatings

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A Woman-Owned Small Business

Planning your next
outage?
Plan on us.

Leaders in
**Nuclear
Fabrication**

- Over 1,000 Projects Delivered Under Nuclear Quality Assurance Programs
- Vertically Integrated Manufacturing
- Sample Projects
 - Lifting and Handling Equipment
 - Spent Nuclear Fuel Canisters
 - Shielded Containers
 - Skids and Construction Modules
 - Obsolete and Custom Equipment

NUPIC Audited | NQA-1 Certified | 10CFR50 Appendix B | 10CFR21
ASME Certificates NA, NPT, NS, U, and S

Paragon

CHANGING THE WAY THE INDUSTRY BUYS AND SELLS PARTS

www.ParagonES.com

865-888-6853



INSTRUMENTATION AND CONTROLS

It's not obsolete, until we say it's obsolete

Through our repair and reverse engineering programs, our experienced I&C Life Cycle Management team can save you millions by solving your equipment obsolescence issues.

COMMERCIAL GRADE DEDICATION

Meeting the Nuclear Promise Through Dedication

Paragon generates thorough technical evaluations with documented critical characteristics and acceptance criteria to ensure all nuclear industry standards and guidelines are met or exceeded.



PEAKS

Changing the Way the Power Generation Industry Buys Parts

With over 7 million industry records, Peaks encompasses all of Paragon's Programs and are available at your fingertips. We've designed programs to help the industry operate safely, address obsolescence issues, reduce costs, lower inventory, and reduce material lead times.

QUALITY

The Industry's Most Trusted Supplier

Trusted by Nuclear operators worldwide, our Quality Program is regulated under US regulations 10 CFR 50 Appendix B and 10 CFR 21. Paragon currently utilizes ASME NQA-1 2008 with the 2009 1A Addenda as the standard of implementation.



Protecting the Environment by keeping the Nuclear Industry Sustainable



- Extending the life of critical assets through I&C Reverse Engineering and Repair
- Innovative Supply Chain Solutions to lower direct costs and inventory
- Lowering the risk of Cyber Attack by providing modern, reliable Analog Components and Systems
- Reduce the direct cost of Safety Related Components and Systems through efficient 3rd Party Commercial Grade Dedication

PSStech

Guarding the Grid.

www.psstech.com

info@psstech.com

101 Skyline Drive, Warrior, AL 35180

205.631.3357

PSStech is an engineering services and manufacturing company located in Warrior, AL. Born out of a need to protect the nuclear industry, PSStech was founded to provide nuclear generating stations with open phase protection (OPP). After the January 30, 2012 open phase event at Exelon's Byron Unit 2, open phase fault detection has since been at the forefront of protection concerns. The PSStech Open Phase Protection System, based on collaborative research performed with the Electric Power Research Institute, Inc., can be used to detect, alarm, and actuate in response to single and double open phase conditions in the offsite power circuit(s).

Since that time, the PSStech OPP System is employed in protecting nearly 40% of the US nuclear generating capacity. With sys-

tems installed in 23 plants, protecting 39 units, the PSStech OPP system is the leader in the industry in open phase protection. Our one-of-kind analog OPP System is impervious to cyber security attacks and was designed solely by PSStech.

Our mission is to solve our customer's most challenging technical problems with integrity by providing reliable, cost-effective solutions.

Building on our success with the OPP System, PSStech provides the following products and services:

Obsolescence

Part obsolescence is a serious issue for both the nuclear power industry and the manufacturing community. In particular,

the obsolescence of electronic components is a serious challenge for the industry, and the severity of this problem is likely to increase. PSStech has responded to this challenge vigorously with an approach to provide obsolescence management that covers all aspects of the product life cycle, from design to production, to in-service support. This approach is based on best practices held throughout the industry to ensure the lowest-cost solution for our clients. We provide complete project management and engineering support ranging from identifying the obsolete component, through engineering the solution, to dedication and acceptance testing.

Reverse Engineering

As a full-service facility, PSStech is equipped to take your obsolete design and reverse engineer a solution. Our industry leading design and fabrication team offers the following:

- Analog designs to replace digital solutions
- One-for-one updated analog replacements
- Restoration of damaged or worn components
- Manufacture of critical spares
- 3D prototype development and evaluation
- 2D and 3D drawing and technical documentation
- Prediction of reliability and life cycle analysis
- Qualification and compliance testing

Design, Prototype, Manufacture and Fabricate

PSStech provides design, prototyping, manufacturing and fabrication services. PSStech personnel are highly trained and motivated to provide industry leading system designs and builds.

PSStech's Manufacturing/Prototyping Services include:

- Milling, Turning, Cutting
- Prototype development
- Full 2 to 5-axis toolpath generation and post-out for in-house or outside designs utilizing CAM programs w/Drilling, Cutting, Milling, & Turning
- CAD drawings for necessary descriptive manufacturing and GD&T communication requirements
- Computer Aided Engineering & Analysis for parts and assemblies
- Industry leading protection system builds of both non-safety and Safety Related designs for the nuclear industry.
- Metal & Composite 3D printing capabilities



PSStech
Guarding the Grid



Manufacturing Services



Engineering Services



Open Phase Protection



Obsolescence Services



PM Services



Reverse Engineering

(205) 631-3357

info@psstech.com

www.psstech.com

NUCLEAR CONTAINMENT SYSTEMS FOR NEW CONSTRUCTION, MAINTENANCE, AND OUTAGE PROTECTION

GRIFFOLYN® CONTAINMENT PRODUCTS

Griffolyn® internally reinforced polyethylene laminates have been designed for a wide range of prospective applications. For more than 30 years, Reef Industries has been providing the nuclear industry with construction, maintenance, and outage protection with a variety of contamination control products. Griffolyn® is performance engineered to be highly resistant to tears and punctures with an exceptional outdoor service life. Whether storing or protecting equipment or isolating and containing contaminated materials, Griffolyn® products can be designed and fabricated to your project requirements.

ADVANTAGES

- Maintain schedule
- Stay on time and within budget
- Reduce cost

REDUCE COSTS AND IMPROVE SCHEDULING FOR YOUR CONSTRUCTION AND MAINTENANCE REQUIREMENTS

All Griffolyn® materials are performance engineered for the most difficult applications while providing an exceptional ability to withstand extended exposure to weather. Griffolyn® products can protect your investments year round. These high quality plastics can be produced with specialized properties including fire retardancy for safety applications around critical

materials or work areas, or anti-static and corrosion protection for sensitive equipment. Cover your investment and protect it with Griffolyn®.



FOR MORE INFORMATION VISIT
www.reefindustries.com
OR CALL TOLL FREE 1.800.231.6074

SPECIAL FEATURES

- Reinforced polyethylene laminate resists punctures and tears
- Fire retardant for safety applications around critical materials and work areas
- Anti-static
- Corrosion inhibitors
- Heat shrinkability
- UV stabilization protects the material from degradation and ensures an outstanding service life for long-term storage
- A wide range of colors and custom printing available
- Stock sizes available for immediate shipment
- Custom fabrication is available to meet your exact specifications
- Protection for FME areas

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Email: ri@reefindustries.com






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CUSTOM
EQUIPMENT COVERS, BAGS & TUBING



Stock rolls available in various sizes
with same day shipping

ANTI-STATIC GRADE AVAILABLE

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FIRE RETARDANT • UV STABILIZATION