

nuclear operations for a secure tomorrow

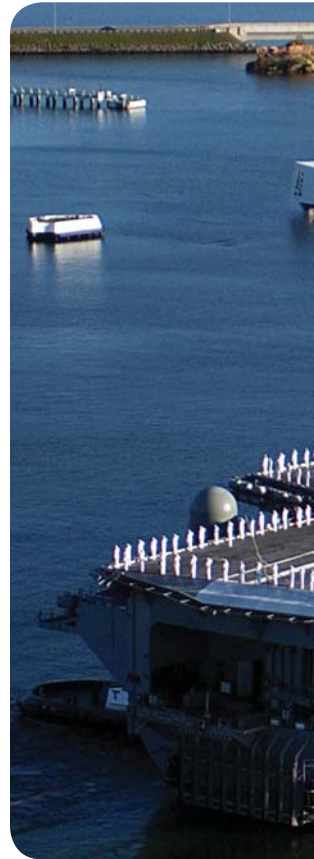


a new source of power

nuclear

In the 1940s, the world was introduced to nuclear energy. Much attention was devoted to this newly discovered source of power. Within time, there were many discoveries about nuclear power, its applications and effects. However, with this new-found knowledge came serious responsibility and accountability.

From the beginning of the atomic age, The Babcock & Wilcox Company (B&W) has been involved in the research and development of nuclear fission, and its relevance to national security. During World War II, B&W provided components, materials and process development for the Manhattan Project, which brought an end to the war. B&W was soon on its way to becoming a leading provider of nuclear technology when it was awarded the contract to manufacture the reactor





USS Ronald Reagan

for the world's first commercial nuclear vessel, NS *Savannah*. In the early 1950s, B&W went on to design and fabricate components for the USS *Nautilus*, the world's first nuclear-powered submarine.

As technology progressed, the U.S. Department of Energy (DOE) expanded its use of nuclear applications. To support the DOE, B&W opened a manufacturing facility in Lynchburg, Virginia. Regulated by the Nuclear Regulatory Commission (NRC), the B&W plant began fabricating specialty components for government programs.

B&W NOG's Barberton, Ohio, and Mount Vernon, Indiana, locations specialize in the design and manufacture of large, heavy components. The two locations are ASME N-Stamp accredited, making them two of only a few North American suppliers of large, heavy-walled nuclear components and vessels.

A third manufacturing site in Euclid, Ohio, fabricates electro-mechanical equipment for the U.S. government and performs design, manufacturing, inspection, assembly and testing activities.

Nuclear Fuel Services, Inc. (NFS), a subsidiary of B&W, operates a uranium fuel materials production facility to support America's fleet of nuclear-powered submarines and aircraft carriers. Located in Erwin, Tennessee, it also converts Cold War-era government stockpiles of highly enriched uranium into material suitable for further processing into commercial nuclear reactor fuel.

For more than five decades, the company has built a steadfast reputation as a trusted supplier to defense programs. This reputation comes from the rock-solid integrity of highly skilled employees who, over the years, have fabricated products that directly support national security.

fabricating

unparalleled products

Babcock & Wilcox Nuclear Operations Group, Inc. (B&W NOG), headquartered in Lynchburg, Virginia, owns and operates manufacturing facilities that supply specialty materials and components to the U.S. government. These operations are located in Virginia, Indiana, Ohio and Tennessee.

B&W NOG's Lynchburg facility and its subsidiary, NFS, are the only two commercial plants licensed to possess and store highly enriched uranium (HEU) in the U.S.

The Lynchburg operation also established itself as a pioneer in nuclear research and development, and opened the first, privately owned Critical Experiment Laboratory. The Lynchburg facility and NFS are a registered historical landmark of the American Nuclear Society.

These plants, secured by an armed response force, fabricate fuel and fuel-bearing precision components that range from a few grams to hundreds of tons. The in-house capabilities include wet chemistry uranium processing, advanced heat treatment to optimize component material properties and a controlled, clean-room environment with the capacity to assemble railcar-size components.

No component is shipped to the customer until it undergoes and passes stringent quality assurance inspections. In-depth quality control measures, leading-edge equipment and thorough testing give



HEU conversion for commercial fuel supports nuclear nonproliferation



Highly trained security force at B&W NOG facility



A skilled workforce and modernized infrastructure

a “stamp of approval” for the reliability of each and every component delivered to the government. From destructive/nondestructive testing, computerized and real-time accept/reject dimensional inspection, to custom inspection gauging and calibration, ultrasonic, cryogenic and zygo inspections, the B&W product is one of unquestioned reliability.

Recognizing that the hallmark of a great company is its ability to adapt to change, B&W NOG has systematically implemented a continuous process improvement methodology at all of its facilities. Lean Six Sigma is being used to identify and improve processes that lead to enhanced productivity and increased customer satisfaction. In addition, the implementation of the Human Performance Improvement (HPI) initiative, has established a new way of thinking about challenges and obstacles. The initiative has been introduced at all five facilities to reduce errors and improve workplace safety.

Constructed in the 1960s, the Mount Vernon facility has been manufacturing components used in both the commercial and government nuclear industries and has heavy-lift capabilities of up to 1,000-ton capacity. The Barberton, Ohio, facility has been in operation for more than 100 years, and in that time has established itself as a world-class manufacturer of high-quality products.

Both the Mount Vernon and Barberton sites are equipped to manufacture large, heavy pressure vessels for nuclear applications. These locations boast impressive capabilities, which include complete design engineering to American Society of Mechanical Engineers (ASME) standards, and rigorous quality systems and controls that meet the rigid specifications of its customers. Both sites are modernized and upgraded to include state-of-the-art manufacturing equipment such as large machining centers, robotic welding areas and full-component, stress-relief furnaces.

Cutting-Edge Technology

Computer-controlled electron beam, plasma and TIG welding capabilities

Solid-model CAD/CAM integrated with manufacturing

Expertise in high-strength, low-alloy steels, nickel-based materials and others

Non-destructive examinations

broadening the

competencies

Several acquisitions have broadened the capabilities of B&W NOG, including a facility in Euclid, Ohio, that fabricates electro-mechanical equipment for the U.S. government. Euclid's capabilities encompass design, manufacturing, inspection, assembly and testing. These in-house skills allow the site to undertake a program from design review and product development to full production and test. The facility has custom-built autoclaves for product assembly and test, and physical capital designed to meet the requirements of precision products. The facility has invested heavily in its machinery and equipment so that it can continue to provide its customer the high level of quality for which it is known.

B&W NOG further expanded its capabilities by acquiring a nuclear fuel manufacturing business that supports America's fleet of nuclear-powered submarines and aircraft carriers. The acquisition of NFS aligns with the already established competencies of B&W NOG and provides a greater breadth of resources to serve its clients. Since 1957, NFS has produced nuclear fuel materials and has expanded its capabilities to include advanced nuclear fuel fabrication and testing, nuclear materials management, conversion of weapons-grade uranium into materials for the commercial nuclear market and nuclear materials recycling.



Bearing cell 5-axis machining center at Euclid facility



NFS technician checks equipment for safe operation



Highly skilled technicians can manufacture, test and characterize all uranium forms

expanding the use

of nuclear products

Supporting the United States' nuclear nonproliferation efforts, B&W NOG is actively engaged in reducing the availability of HEU that could be diverted for use in weapons of mass destruction. Licensed by the NRC to possess, manage and use more than 100 metric tons of enriched uranium, B&W NOG has more than a decade of experience in converting HEU to low-enriched uranium (LEU). The LEU is used in commercial nuclear power plants to generate electricity.

B&W NOG also supports commercial operations through our facilities in Ohio and Indiana by producing large components and providing precision component manufacturing to the nuclear industry.

In 2009, NFS completed a new state-of-the-art facility for additional HEU to LEU processing capabilities. This broadens NFS's capabilities to extract uranium from HEU materials with various undesirable physical, chemical and/or radiological attributes.

The B&W NOG Lynchburg facility and NFS are both qualified to recover valuable uranium by processing scrap material from their internal operations. Both also manage scrap material from other facilities, programs and foreign countries.

Uranium Processing and Downblending

Purification capabilities in excess of three metric tons of HEU annually

On-site, analytical laboratories that use NIST-calibrated standards to conduct metallurgical, chemical isotopic evaluation of nuclear fuel and uranium-bearing materials

Exclusive, direct-metal dissolution processes

developing specialty fuel

for the future

For nearly four decades, B&W NOG has been supporting the design and development of advanced power systems for various specialty applications. B&W NOG has long been perfecting the fabrication techniques for developing compact nuclear reactors, such as those required for Generation IV applications. When deployed, the Generation IV reactors will economically generate electricity and hydrogen.

B&W NOG's experience in processing advanced materials, as well as its extensive capabilities in nuclear fuel manufacturing, nuclear component fabrication and assembly, provides its customers with a turnkey design-develop-deploy option unparalleled in the U.S. nuclear industry. These capabilities stand ready to support near-term deployment opportunities.



Analyzing commercial nuclear fuel particles



A proven leader in the handling and processing of uranium-bearing material for commercial applications

furthering education

through nuclear energy

B & W NOG is the largest domestic supplier of both HEU and LEU aluminum-clad uranium fuel used in plate-type research reactors. Customers in the plate-type reactor community include U.S. colleges and universities, and U.S. Department of Energy laboratories. In addition, B&W NOG fabricates plate-type reactor fuel for nuclear research test sites throughout the world, providing fuel for reactors in Japan, Brazil, Columbia, Belgium, Germany and the Netherlands.

Supporting the DOE's Reduced Enrichment for Research and Test Reactors nonproliferation program designed to reduce the availability of HEU, B&W NOG is working with the Idaho National Laboratory to help develop a high-density LEU fuel required for HEU reactor conversions.

B&W's Research Test Reactors & Targets program has supplied many LEU fuel elements to colleges and universities such as Purdue University, University of Florida, University of Massachusetts (Lowell) and Georgia Institute of Technology.



High Flux Isotope Reactor



Advanced Test Reactor component



USS Ronald Reagan

trusted by

the U.S. Government

B B&W NOG has a culture founded on attention to detail, discipline and commitment to delivering a reliable and on-schedule product, each and every time. Anything less is unacceptable by B&W standards. Providing the nation with products that serve to protect, B&W NOG is proud to be the supplier trusted by the U.S. Government.



USS Enterprise



USS Virginia

delivering
proven results

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