



SPX POWER+ENERGY

Pumping Solutions for Nuclear Power

INNOVATION, DESIGN, MANUFACTURE + AFTERMARKET
SERVICES: PUMPING SOLUTIONS FOR A BETTER WORLD

> ClydeUnion Pumps





SPX - An introduction

SPX is a Fortune 500 multi-industry manufacturing leader, headquartered in Charlotte, North Carolina. SPX manufactures and markets products, components, services and technologies that are integral to meeting today's challenges and tomorrow's needs. We are a place where innovation is fostered, and the real needs of business are understood. We transform ideas into powerful solutions to help our customers meet their goals, overcome business challenges and thrive in a complex, always changing marketplace.

SPX's Flow Technology segment designs, manufactures and markets engineering solutions and products used to process, blend, meter and transport fluids. We also offer equipment for air and gas filtration and dehydration. Our leading brands have global operations which service the food + beverage, power + energy, and industrial processes.



CLYDEUNION PUMPS, AN SPX BRAND - GENERATIONS OF EXPERIENCE

Whilst the name is relatively new, the ClydeUnion Pumps brand is known worldwide for supplying reliable and robust engineered pumping solutions stemming from over 140 years of industry expertise. Our experience spans across several complex industries including oil and gas, nuclear and conventional power generation, desalination and other key markets relevant to our product portfolio.

> ClydeUnion Pumps



Weir Pumps - Clyde Pumps - Mather & Platt -
Drysdale - WH Allen - Girdlestone -
Allen Gwynnes - Harland



Union Pump - David Brown Pumps
DB Guinard Pumps - American Pump - Pumpline





Driven by customer satisfaction

At ClydeUnion Pumps we understand the specialised needs of the nuclear power sector. With five global facilities, three of them fully nuclear qualified, as well as experienced local partners in China and India we are a major supplier of nuclear pumps globally. We draw on over 50 years of nuclear pump experience to provide coded, safety related and balance of plant pumps for all reactor types.

Our involvement in the nuclear power market began with the first ever industrial scale nuclear power plant. Since then we have been central to all major nuclear power programs globally. Our ability to design a

reliable solution for specific needs of the overall nuclear plant, allied to our comprehensive service provision means ClydeUnion Pumps has nuclear pump installations in over 65% of operational nuclear power plants worldwide across many technologies.

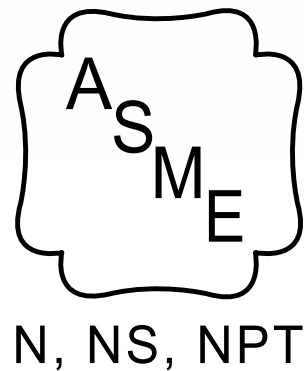
In addition to our involvement in the commercial nuclear power market we continue to provide pumping solutions to the world's naval nuclear fleets, research reactors and other nuclear facilities. Our market focused research and development programs ensure that our solutions match the demanding requirements of current and future technologies, such as generation IV, fusion and small modular reactors.



World class engineering

ClydeUnion Pumps offers the following:

- Dedicated nuclear design department
- In-house seismic, environmental and operability qualification
- Qualification tests under accidental conditions: thermal transients, debris and seismic tests
- Commitment to quality
 - ASME 'N', 'NPT' and 'NS'
 - 10CFR50 Appendix B Program
 - RCC-M
- Large, innovative, in-house research and development facilities
- Comprehensive in-house software and analytical capability



Nuclear solutions



Residual heat removal pump



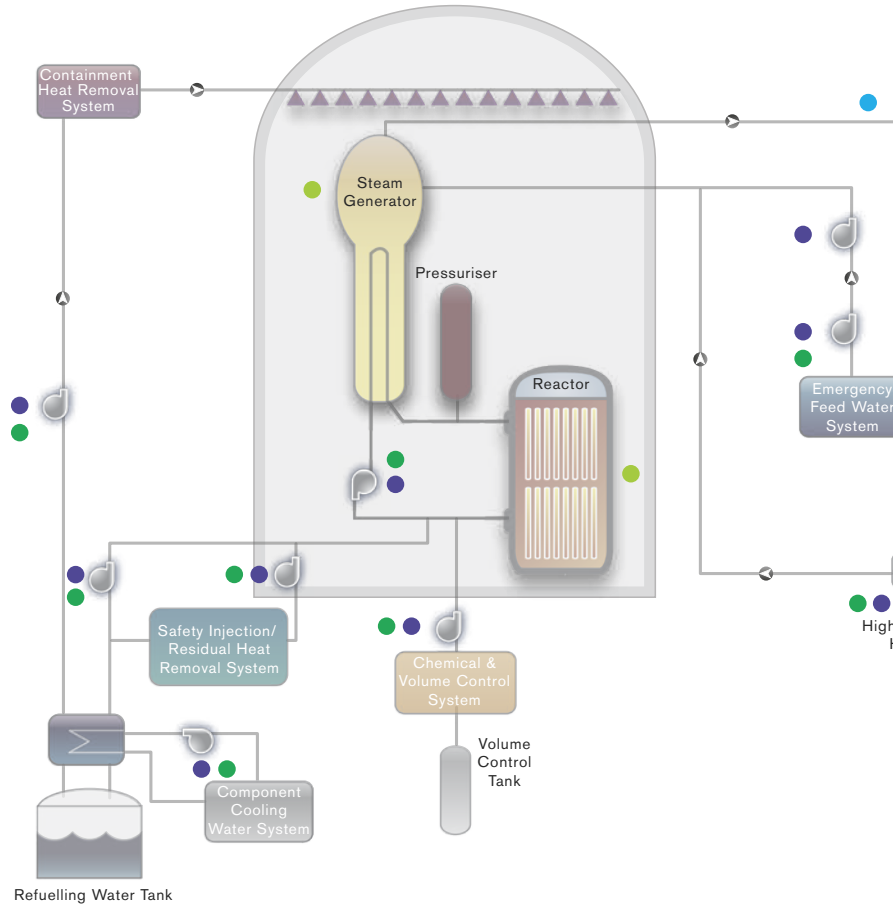
Charging pump



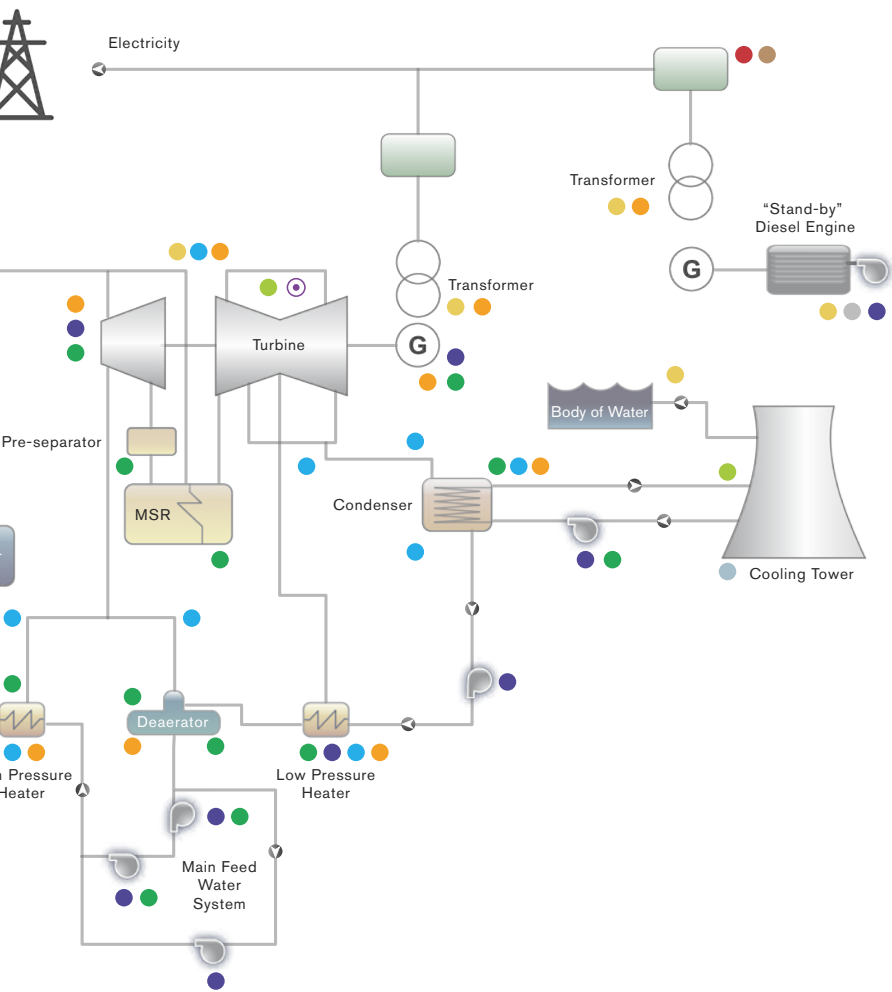
Main feedwater pump



Containment spray pump



- COOLING TECHNOLOGIES
- PLATE HEAT EXCHANGERS
- HYDRAULIC & PNEUMATIC TOOLS
- TEST CHAMBERS/OVENS
- HEAT TRANSFER



- **STRAINERS & FILTERS**
- **PUMPS**
- **CONTROL VALVES**
- **AIR/GAS DRYERS AND PURIFIERS**



Medium head safety injection pump



Motor driven auxiliary feedwater pump



Turbine driven auxiliary feedwater pump



Concrete volute cooling water pump



Market leading products

ClydeUnion Pumps experience as a supplier of specialist safety related pumping equipment for major types of nuclear reactors in commercial operation has enabled us to acquire a thorough understanding of the steady state, transient system modes and environmental conditions under which safety equipment is required to perform.

This understanding is critical, enabling our team of engineers when preparing the necessary seismic, environmental and operational qualification reports to prove and ensure reliability, availability and maintainability of our equipment throughout its working life.

We have a dedicated team of nuclear design and project engineers who ensure our pump design is optimised to your duty. Our capability

includes the latest software to optimise rotor dynamics, hydraulics, conduct thermal and stress analysis as well as simulation of seismic loading.

Class leading test facilities enable us to prove pump performance, whether it be a simple duty test or more complex testing as commonly required for nuclear projects. Our capability includes all major test types including hydraulic performance, NPSH, thermal shock, cavitation and seismic testing. Around 80% of pump failures on start-up are attributable to inadequate installation and commissioning procedures.

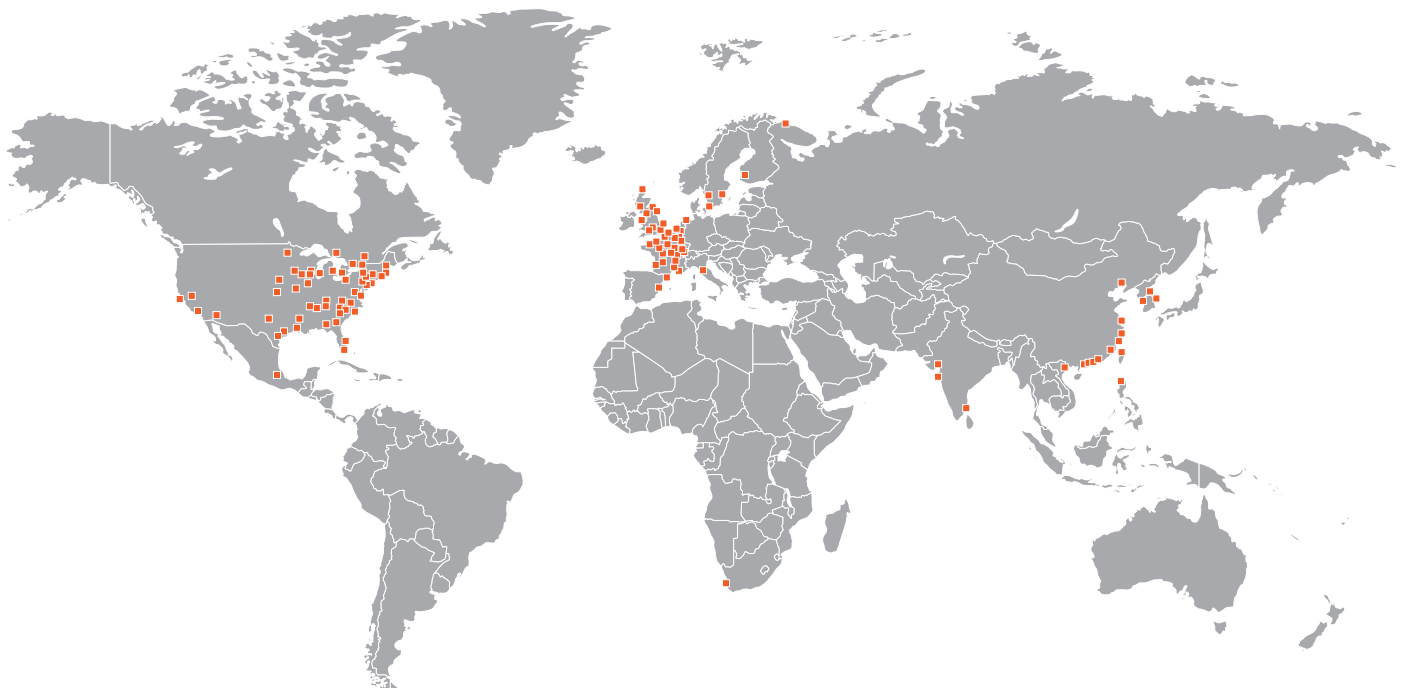
Our installation and commissioning teams use their expertise to ensure best practice processes are utilised enabling trouble free operation and extended pump life.



Global installed base

ClydeUnion Pumps understands the challenges faced to acquire or maintain the high standards required to design and build nuclear coded pumps, and the company has three coded facilities with a long history of excellence. Glasgow, UK; Annecy, France and Battle Creek, USA are qualified to ASME "N Stamp" and/or RCC-M qualifications. In addition we have a global aftermarket organisation that is able to offer full service and upgrade capabilities.

Across all of our coded facilities our approach to quality is rigorous and is at the heart of our offering from the initial design stages through to sourcing, manufacture, testing, installation and commissioning. The experience gained from hundreds of installations allows you to benefit from the reliability we have proven globally in nuclear power stations of numerous reactor designs.





INSTALLATION + COMMISSIONING: TROUBLE FREE COMMISSIONING ANYWHERE IN THE WORLD



PARTS: ANY BRAND, ANY MATERIAL, ANYTIME

Lifetime worldwide support

Every product ClydeUnion Pumps supplies is supported by a full lifetime commitment. ClydeUnion Pumps provides a full aftermarket service, drawing on either its own engineers or fully trained and highly experienced service partners, depending on the location of the installation. ClydeUnion Pumps has service facilities in over 40 countries spread throughout Europe, America, Asia, the Middle East and Africa.

ClydeUnion Pumps after sales support extends across all of its legacy brands as well as new equipment, and provides full backup for obsolete products and for third party equipment. The parts ClydeUnion Pumps supply meet the original specification, or are upgraded where appropriate, and many components can be covered by a Rapid Response option which can have parts on site within 24 hours.

ClydeUnion Pumps after sales support is subject to the same supply chain management as the pump manufacturing. This provides customers with the lowest lead times and costs whilst meeting the highest standards of quality assurance.

In addition to spare parts, routine servicing, overhauls and inventory control, the aftermarket support covers upgrades and comprehensive technical advice about the potential refitting of existing installations for greater efficiency and reliability. ClydeUnion Pumps can work with your own engineers to carry out meticulous inspections and advise on maintenance schedules, carry out full vibration analysis, pressure and pulsation testing, and train your service personnel.

ClydeUnion Pumps history and breadth of experience, as well as its geographical coverage and expertise, make it the natural first choice for any pump related problem or enquiry, no matter what the location, the scale of the task or the original manufacturer.

We guarantee supply of parts for all heritage brands and/or obsolete products, including:

- Weir Pumps
- Clyde Pumps
- Union Pump
- Girdlestone
- Mather & Platt
- Harland
- Drysdale
- WH Allen
- Allen Gwynnes
- David Brown Pumps
- DB Guinard Pumps
- American Pump
- Pumpline





PUMPING SOLUTIONS
FOR NUCLEAR POWER

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