

SERVICE SOLUTIONS

PERFORMANCE TESTING,
UPGRADES, RE-RATES AND RE-ENGINEERING

 **CLYDEUNION® PUMPS**



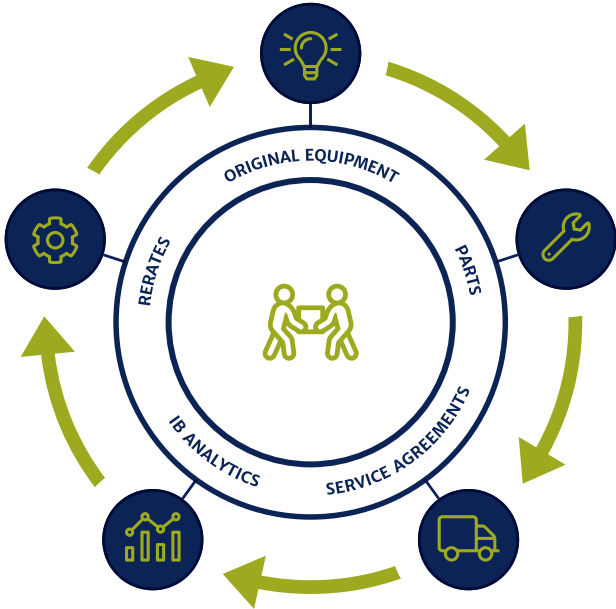
Throughout the service life of your pumping equipment process change, design improvements and material developments create opportunities to greatly improve the performance and reliability of your asset. With over 140 years of experience combined with the latest design and optimisation tools our technical services team offers a comprehensive range of engineering solutions to modify pumping equipment to satisfy any such change in requirements.



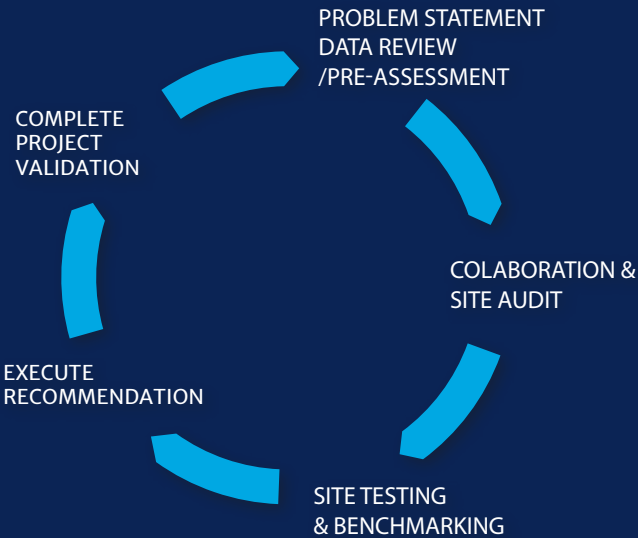
OUR COMPREHENSIVE SERVICE APPROACH IS BASED ON 3 KEY AREAS:

- ASSET PERFORMANCE
- ASSET AVAILABILITY
- ASSET RELIABILITY

Possessing a wealth of pump and system design knowledge, and fully equipped with the latest design, analytical and pump testing equipment, our technical services team can be employed across a range of services to ensure your critical rotating plant is operating reliably, safely and at optimal levels of efficiency. Working in partnership with our customers, the focus of these important aspects of pump operation deliver increased Mean Time Between Failures and plant life, reduced parts consumption, increased production and very importantly, minimise energy costs and carbon emissions.



- Through the understanding of the plant and operational data, operators work with Celeros FT to generate a problem statement.
- Through consultation and data capture with our engineers will create a solution.



1 CONSULTATION
We review the equipment details and project requirements together with the customer, determine the scope of the original purpose and application, outline potential solutions, and agree upon the way forward.



2 DATA CAPTURE
We employ laser scanning to obtain accurate, rapid and reliable data from sample components. Scanning can be performed at our service facilities or on site to ensure minimum downtime.

Improving clients asset performance through system alignment and overhaul



- Improve equipment efficiency
- Use of efficiency coatings
- Tighter clearances through material enhancements
- Align pump performance to system characteristics
- Increase output to suit higher system/process demands
- Reduce output to suit system/process changes

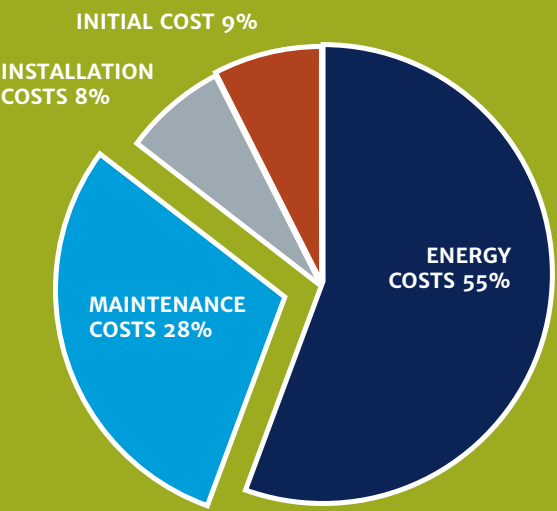


METHODS EMPLOYED

The technical services team deploys pump system assessment methodology. The objective in this method of assessment is to ensure a uniform and systematic approach in the assessment of industrial pumping systems to identify opportunities for reducing energy consumption and carbon emissions in line with legislative and government targets.

This method combines a consultative approach with a thorough system energy and reliability audit, utilising our full suite of testing equipment including flow and power meters, multi-channel data logger, vibration analyser, pressure transducers and temperature gauge.

COST OF OWNERSHIP FOR TYPICAL PUMP



SYMPTOMS OF POOR SYSTEM AND PUMP PERFORMANCE

Most pump systems will benefit from a system audit and pump test to optimise system performance, however the following examples highlight your pump is no longer matching your system requirements.

If any of the symptoms are evident then a site test and/or system assessment will identify how to improve your pump and system performance.

- Standby pump in continuous operation
- Pump operating conditions do not match nameplate conditions
- Pump output is controlled by discharge valve throttling
- High machinery vibration and temperature
- Poor reliability and MTBF
- High wear rates and parts usage
- High power consumption

PROJECT VALIDATION

Following completion of the asset re-rate or upgrade Celeros FT engineers will work with our clients to validate the work completed creating a benchmark that can be used for future maintenance planning.

LONG TERM ASSET MANAGEMENT – PREDICTIVE ANALYTICS

Through the use of technology and installed asset management equipment Celeros FT can work with the operators data to predict optimum times to remove the asset for planned maintenance activities. This pro-active

planning enables the appropriate spares and resources to be available to execute the work thereby minimising the operational downtime.

ASSET AVAILABILITY

- Condition Monitoring
- Addition of instrumentation
- Remote analysis
- IoT
- Remote helpdesk technical support 24/7



ASSET RELIABILITY

MATERIAL UPGRADES

Material upgrades are available to satisfy increased plant life requirements and we offer our expertise in the development and application of corrosion resistant materials, wear resistant coatings and non-metallic materials. These upgrades can result in excellent solutions where irons, bronzes and less corrosion resistant stainless steels were originally specified.

MECHANICAL DESIGN ENHANCEMENT

Technical upgrading service is available for our customers who desire reliable, competitive, quality pump sets. Our engineering team analyse current design advancements using the latest 3D design tools to resolve seal leakage, reliability issues and improve noise and vibration performance.

IMPROVING ASSET RELIABILITY THROUGH

RE-ENGINEERING SOLUTIONS FOR CRITICAL APPLICATIONS

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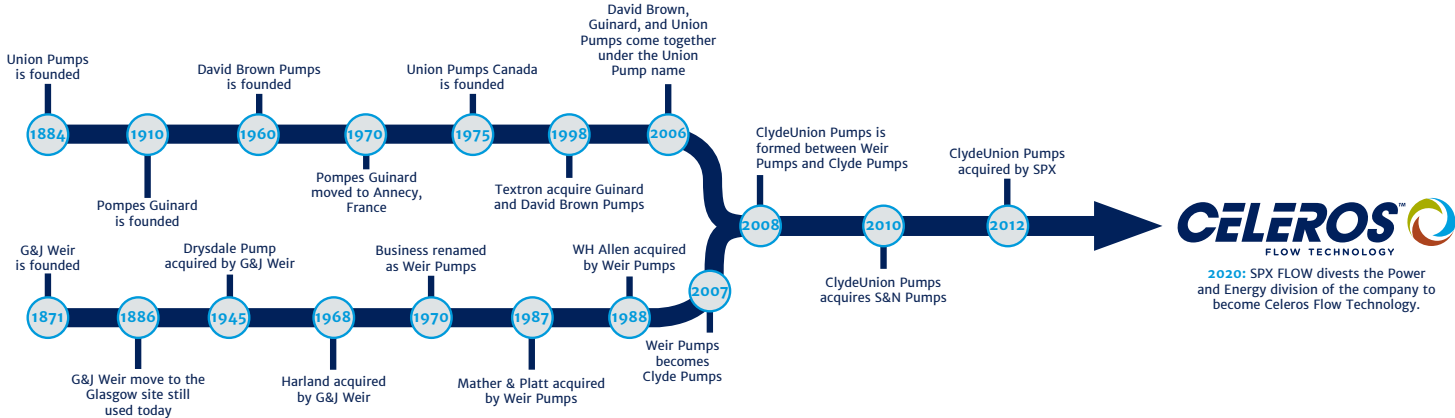
- OPTIMIZE PUMP PERFORMANCE
- REDUCE TOTAL COST OF OWNERSHIP
- RENEW OBSOLETE EQUIPMENT



IMPROVING CLIENTS ASSET RELIABILITY DESIGN IMPROVEMENTS, MATERIAL UPGRADES

- Improve rotor dynamics
- Balance disc to drum
- Swirl Brakes
- Wear ring geometry
- Shaft stiffness improvements
- Improve materials of construction
- Hardened running surfaces
- Use of composite materials
- Erosion/corrosion resistance improvements
- Improve bearing life
- Bearing guards
- Water in oil monitoring
- Improve Emission Leakage
- Cartridge seal assemblies

CLYDEUNION PUMPS HISTORY





| **SPEED**
| **EXCELLENCE**
| **PARTNERSHIP**

CLYDEUNION® PUMPS

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