

Extending Equipment Life

Repairs & Upgrades | Parts | Field Services | Asset Performance Management





Introduction to ITT

ITT is a diversified leading manufacturer of highly engineered critical components and customized technology solutions for the transportation, industrial, and oil and gas markets. Building on its heritage of innovation, ITT partners with its customers to deliver enduring solutions to the key industries that underpin our modern way of life. ITT is headquartered in White Plains, N.Y., with employees in more than 35 countries and sales in approximately 125 countries. ITT's Industrial Process (IP) value center is a dynamic business expanding on a global scale.

Headquartered in Seneca Falls, New York, IP offers a portfolio of world-leading brands in industrial pumps, valves and monitoring and control equipment, and offshore water treatment systems. Through ITT PRO Services, it services every brand of pump and rotating equipment. For parts, repair, service, upgrades, condition monitoring or any other life cycle service.



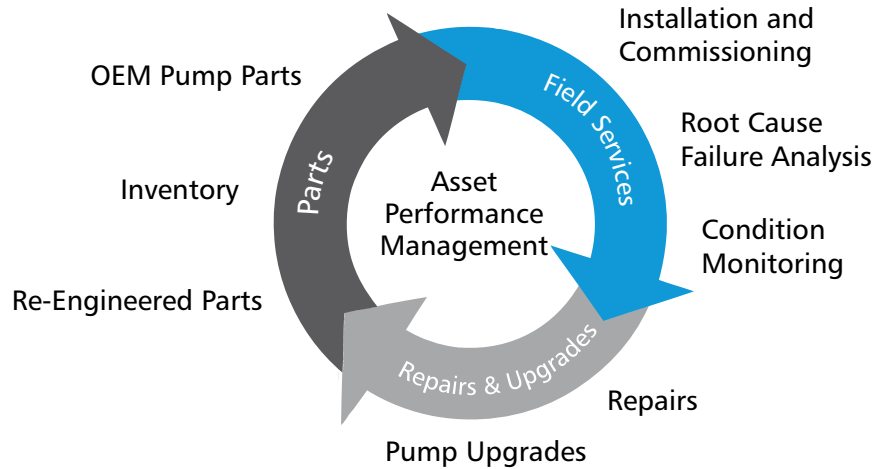
ITT PRO Services



— An ITT Brand

Reliability has no quitting time.

Building on centuries of pump design experience, **PRO Services** provides an array of services focused on reducing equipment total cost of ownership (TCO) and increasing plant output, including condition monitoring, predictive maintenance contracts, field service, engineered upgrades, inventory management, and overhauls for pumps and other rotating equipment.



Repairs

Our ISO 9001:2015 Certified PRO Services Centers have the experience and expertise to repair your equipment back to OEM design standards, resulting in extended run times and reduced operating costs.

PRO Repair technicians repair ALL brands of pumps and rotating equipment including:

Rotating Equipment
Vacuum Pumps
Compressors
Blowers
Centrifuges
Turbines
Babbitted Bearings
Mixers
Fans
Agitators
Gearboxes

- Reducing your cost of ownership and extending equipment life.
- No need to source different product specialists depending on the equipment needing repair.
- One call, one face, one invoice.

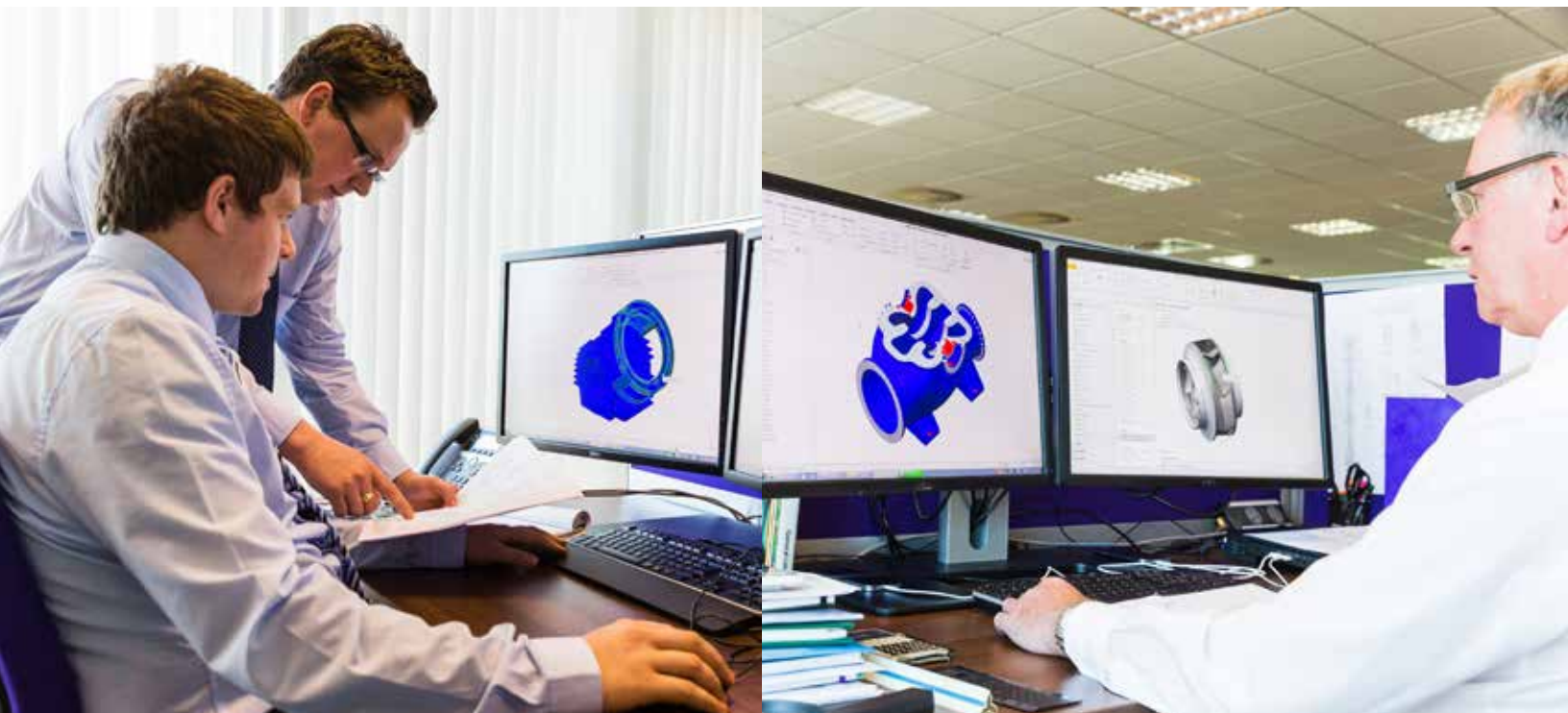


Custom Upgrades

Using our extensive design and system expertise, ITT PRO Services are uniquely equipped to carry out root cause analysis studies on problematic equipment. Utilizing the latest design methods coupled to our industry experience, we can extend the life of your equipment through:

- **Mechanical upgrades:** such as shaft redesign to increase rotor rigidity and integrity or bearing upgrades to increase load capacity.
- **Material upgrades:** using our advanced material capabilities to offer complete changes to base materials of construction, eliminating wear through coating technology or eliminating dry run problems using non-metallic materials.
- **Hydraulic upgrades:** can address many of the root causes of poor reliability. Adjustments can be made to the design/best efficiency point of your equipment within the bounds of your current space envelope using hydraulic re-rates or a complete drop in solution to the latest in design standards.

ISSUE	POSSIBLE CAUSE	APPLICABLE UPGRADES		
		Mechanical	Material	Hydraulic
SHAFT FAILURE	Stress concentrations / Material incompatible with fluid / Running outside allowable operating flow	X	X	X
BEARING FAILURE	Excessive temperature / Inadequate lubrication / Excessive bearing loads	X		X
SEAL FAILURE	Excessive shaft deflection / Running outside allowable operating flow	X		X
EROSION DAMAGE	Material hardness insufficient / Running outside allowable operating flow		X	X
CORROSION DAMAGE	Material incompatible with fluid		X	
EXCESSIVE WEAR	Shaft flexibility / Material hardness insufficient / Running outside allowable operating flow	X	X	X
CAVITATION DAMAGE	Material hardness insufficient / NPSH margin inadequate		X	X
INSUFFICIENT FLOW/HEAD	Change in process demands			X



Upgrade Programs

ITT PRO Services can provide a number of pre-engineered upgrades that include hydraulic re-rates to operate at best efficiency point, mechanical changes to latest standards including API and materials improvement to increase life.

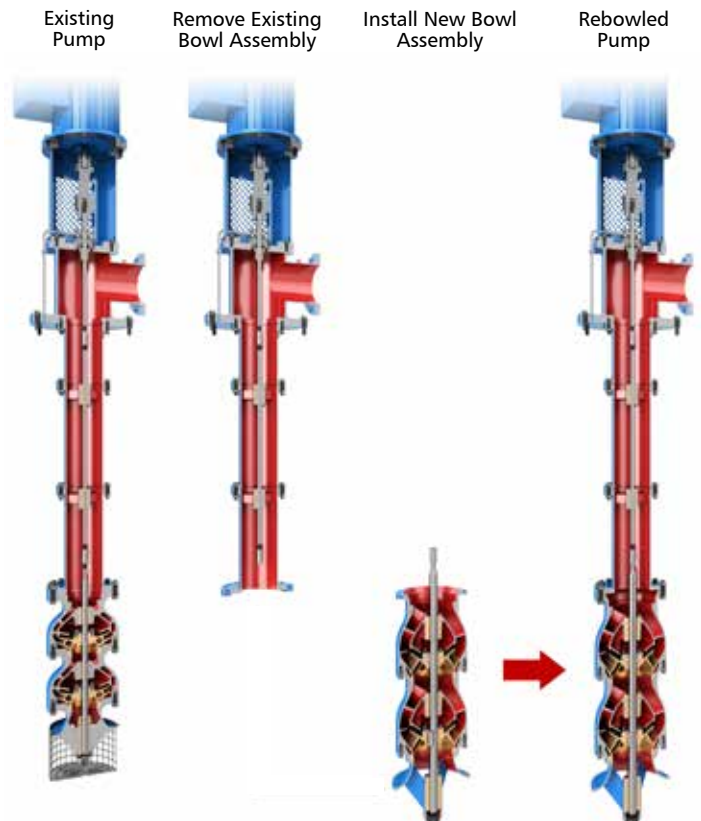
PRX-OH2

Our API 610 OH2 type bearing housing upgrade is market leading in its design, allowing it to be retro-fitted into an existing space envelope whilst maximizing reliability through increased shaft stiffness resulting in lower shaft deflections and increased mechanical seal life. This upgrade is designed such that the existing casing and impeller is re-used, meaning minimal site disruption whilst improving plant safety through the ability to fit the latest design of mechanical seals.



PRX-VSR

With the aim of being more economical than a complete new pump, replacing the bowl assembly of a pump could be the solution for many pump problems with no disturbance to the existing piping and re-using some of the original pump parts such as the discharge head, mounting plate and the driver. Our pre-engineered vertically suspended pump bowl assembly upgrades allow you to improve your pump performance and extend your pump reliability in the most economical manner.



ITT OEM and Re-engineered Parts

In addition to providing OEM parts for the full suite of ITT pump brands, we also supply replacement parts for all other pumps helping to solve pump performance or part supply issues for obsolete equipment.

Utilizing global engineering center capability, regional manufacturing resources, combined with the latest available technology, PRO Services is able to re-engineer parts to improve hydraulic performance and equipment life cycle.

All parts meet or exceed OEM specifications at very competitive pricing and often with faster lead times. These parts deliver the advantages of ITT's advanced modeling capabilities and integrated pattern shop, and more than a century of pump design and manufacturing experience for a variety of applications worldwide.



Field Services

PRO Services brings its expertise and global coverage to support your equipment on site to ensure reliable, trouble free operation. Our Field Services team are experienced at supporting all types of pumps and rotating equipment. Using the latest industry equipment and capabilities we can provide a variety of services including installation & commissioning, machine analysis, removal and installation services and field repairs 24 hours a day, 7 days a week, 365 days a year.

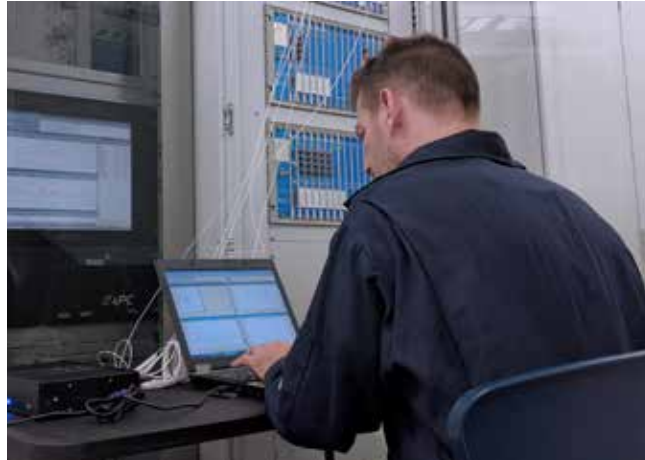


Engineering Services

Root Cause Analysis

At ITT PRO Services, we don't stop once we found out what happened – we get to the root cause of the problem by always asking why. Utilising our wealth of design experience in Original Equipment and the latest design tools and software, coupled with our dedicated aftermarket engineering teams, we solve the problems that cause bad-acting equipment and excessive maintenance spend for the long term. ITT PRO Services is uniquely positioned to eliminate bad actors through the following dedicated aftermarket capabilities;

- CAT IV vibration analysis
- Structural dynamic analysis
- Advanced hydraulic design
- Advanced 3D modelling
- Metallurgical analysis
- Rotor lateral / torsional analysis
- Fully equipped service facilities
- Solutions Engineers direct / on-site



Training

An offering of courses that develop reliability competencies in operation, maintenance, optimization and design of pump systems. This program offers open enrollment courses including: Fundamentals of Pump Operation, Pump System Maintenance for Reliability, Fundamentals of Pump System Troubleshooting, Driver to Pump Alignment, Lubrication for Reliability, Introduction/Basic Vibration Analysis, Critical Elements of Asset Management and Linking Lean with Reliability. Additional training is offered through private courses at customer sites with a hands-on interactive pumping system.



Asset Performance

Condition Monitoring

The i-ALERT Asset Intelligence platform helps you to make the crucial decisions about your equipment before there is a problem. There is no system available that offers the performance, flexibility, and rapid deployment to monitor the health of any rotating machine. The i-ALERT sensors combines the latest in wireless technology and low cost sensing into a safe and rugged package. Safely collect machine health data with the i-ALERT mobile app or the i-ALERT gateway. View all your i-ALERT enabled machines on the i-ALERT Ai platform to solve problems before they become costly failures.



Bluetooth Sensors

Monitor tri-axial vibration, temperature, run-time hours and pressure



Mobile App

Monitor your machine right from your phone with the free mobile app.



Gateway

Add remote monitoring capabilities by leveraging remote data collection devices



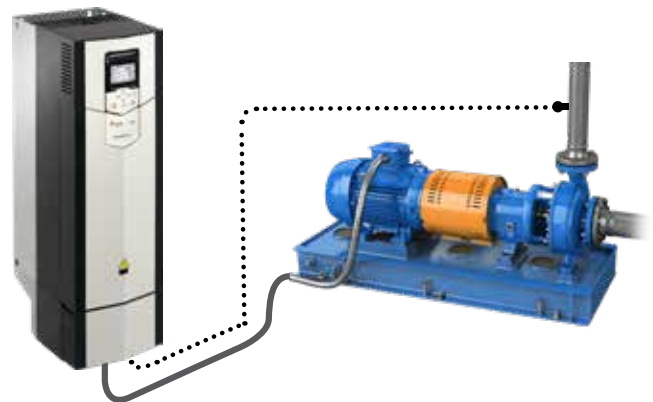
Ai Platform

Monitor all of your i-ALERT sensors and machines from a simple web interface

Process Optimization

Leveraging over 170 years in process machinery design, manufacture and operation PRO Services can optimize the efficiency of your pump systems through mechanical and control modifications. Our engineers determines the cost advantage for alternatives and develop action plans with your internal teams to implement a reliable process or equipment upgrade to reduce energy and improve uptime.

Upgrade your pump system with the industry award winning PumpSmart variable speed pump controller. Improve process control, lower energy consumption and protect the pump from costly process upset conditions. PumpSmart keeps your pump operating running longer and more efficiency with patented pump control and protection algorithms.



Service Locations

North America

Baton Rouge, LA P: +1.225.665.3726
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Sydney, Australia P: 61 (0)2 9987 142

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Bogota, Colombia P: 57-1-7432168
Lima, Peru P: 511-475-7878
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<https://www.ittproservices.com/About/Service-Locations>



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