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Turbo Power Services

Fuel System Solutions



Introduction

Founded in 1985, Turbo Power Services (TPS) specialises in the supply, overhaul, upgrade and test of gas turbine ancillary equipment and fuel system components for the oil, gas, petrochemical and power generation industries.

With facilities located in the UK and UAE servicing a customer base in over 80 countries, TPS operates successfully on a global scale. Working with major original equipment manufacturers, service companies and end users of light industrial, heavy industrial and aero-derivative gas turbines.

Components are overhauled, tested and calibrated in-house at TPS's state-of-the-art facilities, using specialist test benches and instrumentation that assimilate operating conditions and test parameters.

TPS offers rapid repair and performance testing in accordance with original equipment specification. By working closely with our customers, TPS has established a proven track record of increasing efficiency and performance of rotating equipment whilst minimising downtime during outages.

Experts in the supply, overhaul, upgrade and testing of gas turbine auxiliary components, including:

- ▶ Fuel Nozzles
- ▶ Flow Dividers
- ▶ Compressors & Blowers
- ▶ Hydraulic & Fuel Pumps
- ▶ Actuators
- ▶ Process & Control Valves
- ▶ Magnetic Clutches
- ▶ Outage Support
- ▶ Engineering Services



Providing specialist support to the gas turbine service industry

Capabilities

With over four decades of industry experience, TPS offers unparalleled knowledge and support in enhancing the efficiency and performance of rotating equipment. TPS operates bespoke test benches and precision instrumentation designed to accurately measure and analyse the working parameters of fuel system components post overhaul.

TPS are supported by experienced engineers and technical experts to carry out detailed inspection, overhaul and testing. TPS can tailor processes to meet the needs of individual customers and their specific project requirements.

Cleaning and Process equipment:

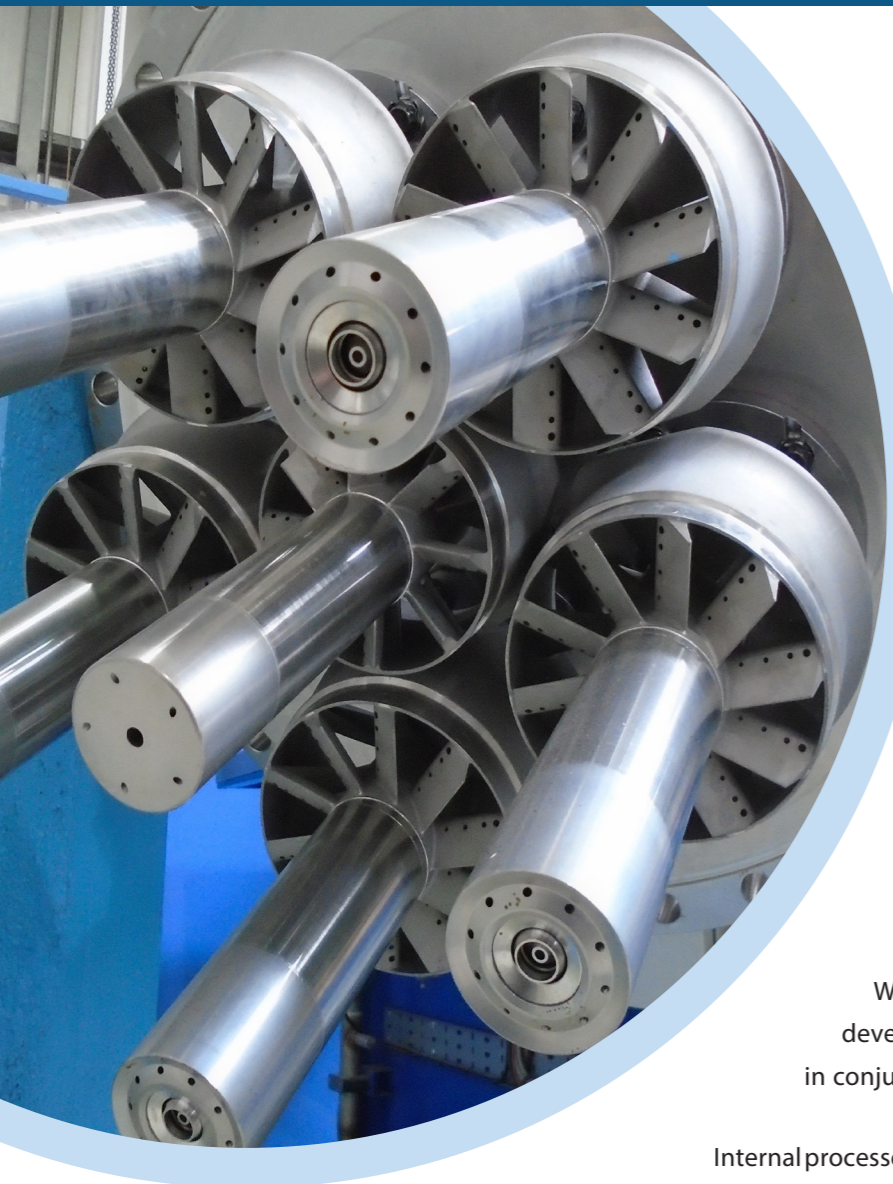
- ▶ High pressure jet washers
- ▶ Solvent degreasing tanks
- ▶ Chemical soak tanks
- ▶ Shotblast cleaning
- ▶ Aquablast cleaning
- ▶ Ultrasonic cleaning and back flushing

Inspection Equipment:

- ▶ Faro™ arm portable CMM inspection
- ▶ Kemet™ optical flats
- ▶ Sigma lateral clearance comparator
- ▶ Precision bore gauges
- ▶ Workshop metrology equipment
- ▶ Borescope inspection
- ▶ Vibration measurement analysis
- ▶ NDT - Dye penetrant / Ultrasonic

TPS also offers the following supplementary services:

- ▶ Fault-finding and Diagnosis
- ▶ Failure investigation
- ▶ Root cause analysis
- ▶ Upgrades
- ▶ Positive material identification
- ▶ Rotor balancing
- ▶ Shaft straightening
- ▶ Special coatings
- ▶ Sealing analysis
- ▶ Bespoke test procedures



Fuel Nozzles

TPS specialises in the supply, overhaul, upgrade and flow testing of fuel nozzles, ranging from single fuel nozzles to complete combustor assemblies.

- ▶ DLN Fuel Nozzles
- ▶ D/F Conventional
- ▶ Industrial
- ▶ Aero derivative
- ▶ Legacy Fuel Nozzle

Refined approach

TPS uses specialist in-house test rigs and instrumentation for air and liquid fuel flow testing of fuel nozzles and assemblies. All calibration is fully traceable to UKAS sources.

With a wealth of knowledge and experience TPS have developed a range of overhaul and upgrade procedures in conjunction with OEM's, service companies and end users.

Internal processes include: Disassembly, clean, inspection, replacement of consumables/worn components, reassembly, calibration and test. TPS provide comprehensive inspection reports and test reports for mass & volumetric air flow rates, spray cone characteristics, cone angle, spread and pressure integrity.

Utilising a progressive approach TPS continue to develop their repair and test processes to cater for latest fuel nozzle combustion technology.

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As part of the OEL Group, TPS continues to supply and develop a wide range of gas turbine components that are compatible with existing OEM designs.



Flow Dividers

Approved Sales and Accredited Repair Centre

With over 30 years experience overhauling radial and linear flow dividers, TPS offer full support for the following manufacturers across UK, Europe, MENA and APAC regions.

- ▶ Roper
- ▶ Scherzinger
- ▶ Shimadzu
- ▶ Hitachi

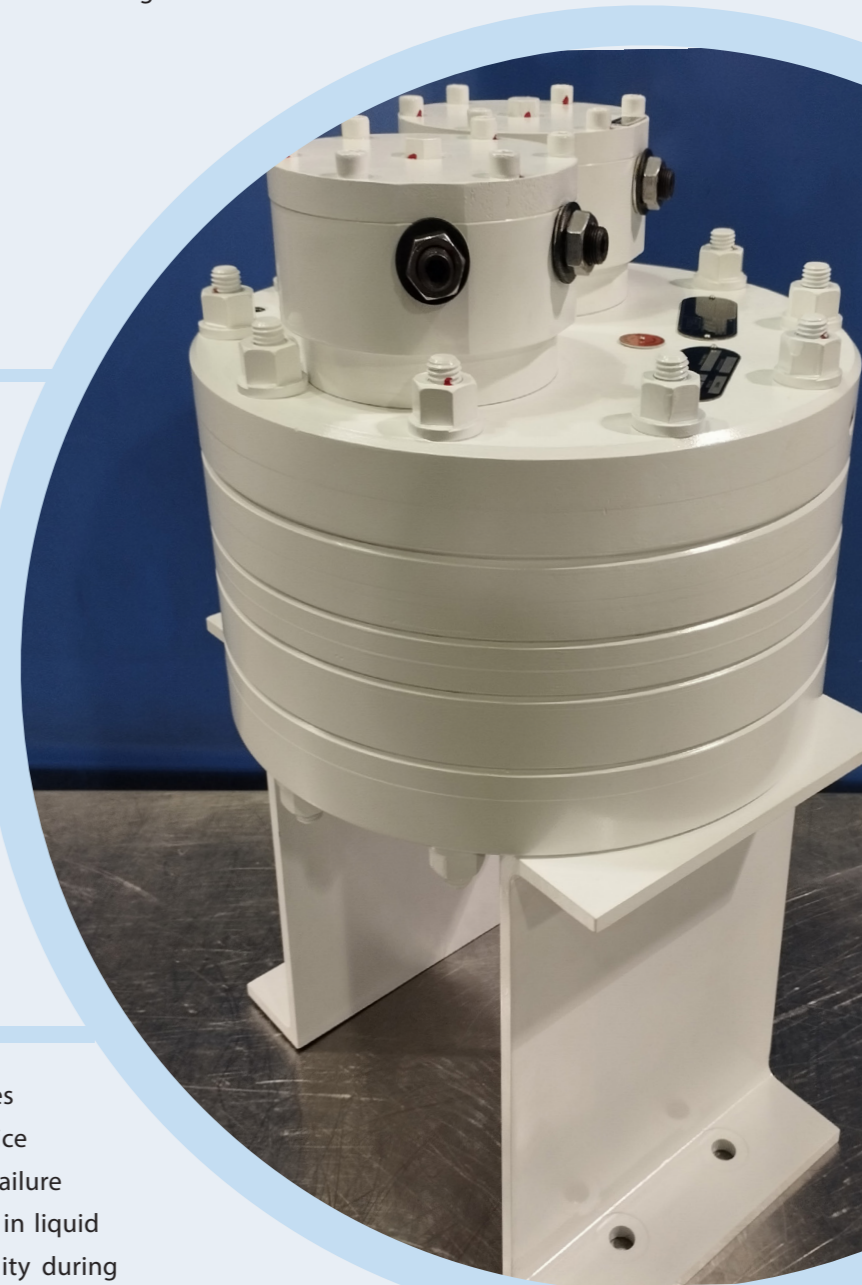
Approved sales & repair

As an authorised distributor and accredited repair facility, TPS are supported by the necessary dynamic flow test equipment, replacement parts and latest procedures to ensure linear and radial flow dividers conform to the original equipment specification.

- ▶ Repair - to original specification
- ▶ Upgrade - to corrosion-resistant Duraflow technology
- ▶ Replace - the ideal opportunity to upgrade

Upgrading to Duraflow technology improves corrosion resistance and increases service life. Upgraded units are resistant to failure from particulate contaminants in liquid fuel and offer high reliability during startup of liquid fuel systems.

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Compressors & Blowers

TPS specialises in the overhaul, component repair and dynamic testing of air-ends, atomising air and booster compressors. Commissioning TPS to carry out a comprehensive overhaul offers significant reduction in downtime and cost, when compared to purchasing a new assembly.

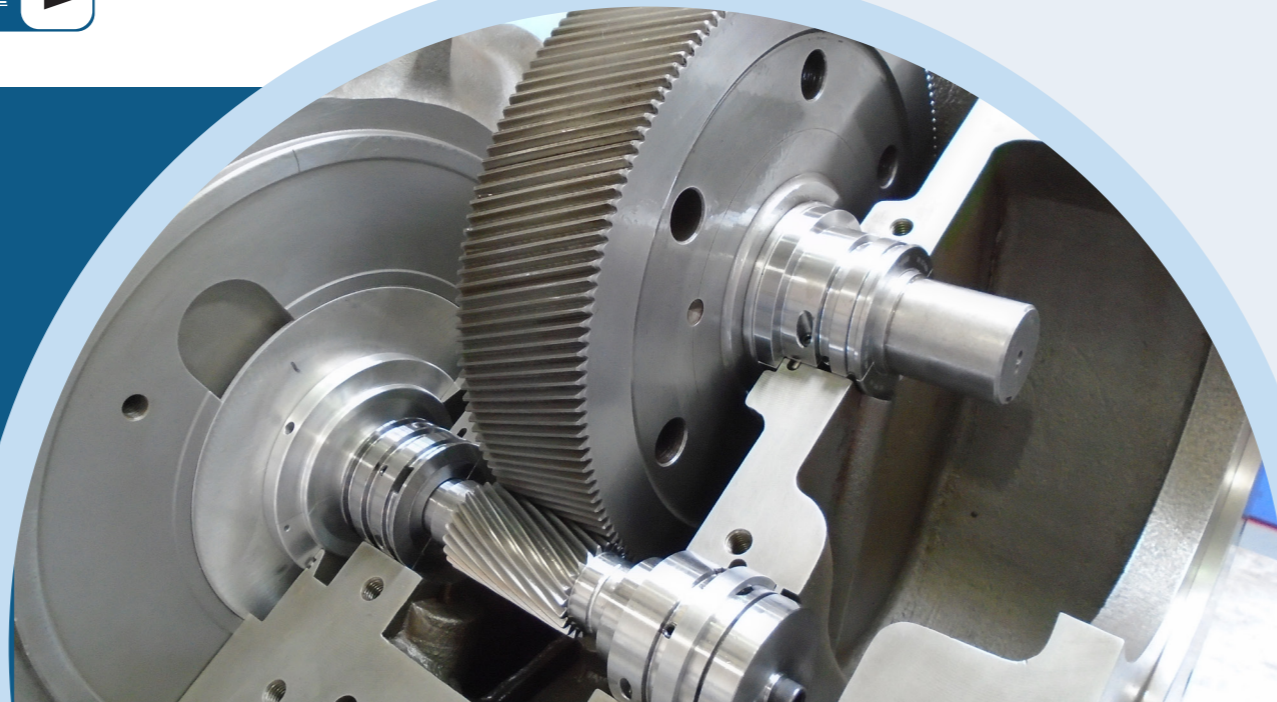
- ▶ Single-stage centrifugal
- ▶ Multi-stage centrifugal
- ▶ Rotary screw
- ▶ Rotary lobe
- ▶ Rotary vane
- ▶ Reciprocating

Typical Services Offered:

- ▶ White metal bearing repair
- ▶ Dynamic balancing of rotor
- ▶ Shaft / Journal diameter recovery
- ▶ Refacing of drive gear thrust faces
- ▶ Leak check glands and seal faces
- ▶ Spin test to check operational parameters
- ▶ Volumetric / Mass-flow testing
- ▶ Rotable / Repair exchange

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Through a progressive approach of continued development, TPS facilities are equipped for the repair of internal components, provision of full support and root cause investigation into component faults/failures.



Hydraulic and Fuel Pumps & Motors

All overhauled hydraulic and fuel pumps are performance tested ensuring the acceptance criteria is achieved. As an authorised distributor and accredited repair facility, TPS are supported by the necessary dynamic flow test equipment, access to replacement parts and latest procedures to ensure that all pumps conform to the original equipment specification.

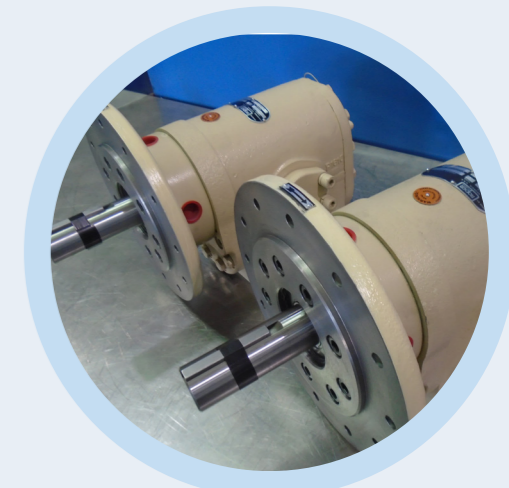
TPS project teams are subject matter experts in overhauling hydrodynamic pumps and cater for the following pump types:

- ▶ Light and heavy fuel pumps
- ▶ High pressure pumps
- ▶ Lubrication oil pumps
- ▶ Twin and triple screw pumps
- ▶ Internal and external gear pumps
- ▶ Radial piston pumps
- ▶ Axial piston pumps
- ▶ Centrifugal pumps (Horizontal / Vertical)



Approved Sales and Repair Centre

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Actuators

TPS specialise in the overhaul, component repair and testing of various types of hydraulic, electro-hydraulic and pneumatic actuators. Choosing TPS to perform a comprehensive service of your actuator will result in substantial cost savings when compared to purchasing a new unit from the original equipment manufacturer.

TPS service actuators used for various applications, including in the power generation and heavy industrial sectors, these include:

- ▶ IGV actuator
- ▶ VSV actuators
- ▶ VBV actuators
- ▶ Steam control actuators
- ▶ Hydraulic coupling & decoupling

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Torque Converter and Magnetic Clutches

TPS offer support for the overhaul of torque converters and magnetic clutches used on gas turbines.

Our processes involve overhauling and load testing the equipment to ensure correct operation prior to return delivery. TPS guarantee that all the work carried out conforms to the original equipment specification.

Choosing TPS to perform a comprehensive service of your equipment will result in substantial cost savings when compared to purchasing a new unit from the original equipment manufacturer.

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Process and Control Valves

TPS understand the critical importance of the different types of valves that are responsible for the safe running and operation of a gas turbine. TPS overhaul and test valves in accordance with the original equipment specification from every system within a gas turbine as well as associated industry sectors.

TPS project teams have the correct product knowledge and skill set to perform high-quality overhauls in line with original equipment specification. These skills are supplemented by our extensive product library and engineering expertise acquired since our founding in 1985.

TPS overhauls valves to original equipment specifications, offering a standard 12-month warranty. TPS caters to various types of valves, including:

- ▶ Solenoid trip valves
- ▶ Solenoid operated
- ▶ Servo motor operated
- ▶ Pneumatically operated
- ▶ Hydraulically operated
- ▶ Fuel valves (Liquid / Gas)
- ▶ Bleed valves (Air)
- ▶ Temperature regulating (Air / Oil)
- ▶ Purge valve (Air / Oil)
- ▶ Check valves
- ▶ Servo valves

Operational and functional testing:

- ▶ Flow measurement
- ▶ LVDT testing / calibration
- ▶ RVDT testing / calibration
- ▶ Electrical operation
- ▶ Hysteresis
- ▶ Seat / Stem leakage
- ▶ Pressure testing
- ▶ Trip function

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Outage Support

At TPS we understand the weight of responsibility placed on end-users during an outage, our command of the operational pressure is reflected in our industry leading on-time delivery. This is something we take pride in and strive to maintain, our project teams work around the clock to ensure the critical outage deadlines are met.

We are passionate about positioning ourselves as the safest pair of hands in the industry for high value fuel system assets. We offer a complete outage service, handling the entire project package that we return certified and ready for successful commissioning.

Our philosophy is to integrate our support with the needs of the customer and our aim is to never fail to deliver and this is reflected in the satisfaction of our customers.

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Quality System

TPS is ISO 9001:2015 & 45001:2018 certified and duly undergoes mandated NQA audits.

Senior management demonstrate robust leadership and 'hands on' integration with the QMS always ensuring that Total Quality Management and Health & Safety is the vanguard of our business development strategy.



Engineering Services

Fuel System Optimisation

TPS's state-of-the-art service centres have the ability to overhaul and calibrate to the highest standards, providing a technical support service that is specific and relevant to our customers' products. TPS has the ability to calibrate and optimise the entire fuel system equal to or better than the OEM, ensuring reliable, efficient running.

Technical Guidance and Support

TPS will provide guidance and support in identifying repair requirements. We will collect technical data as required and present a pre-repair inspection report, supplemented by a quotation to restore your assets to an optimum condition.

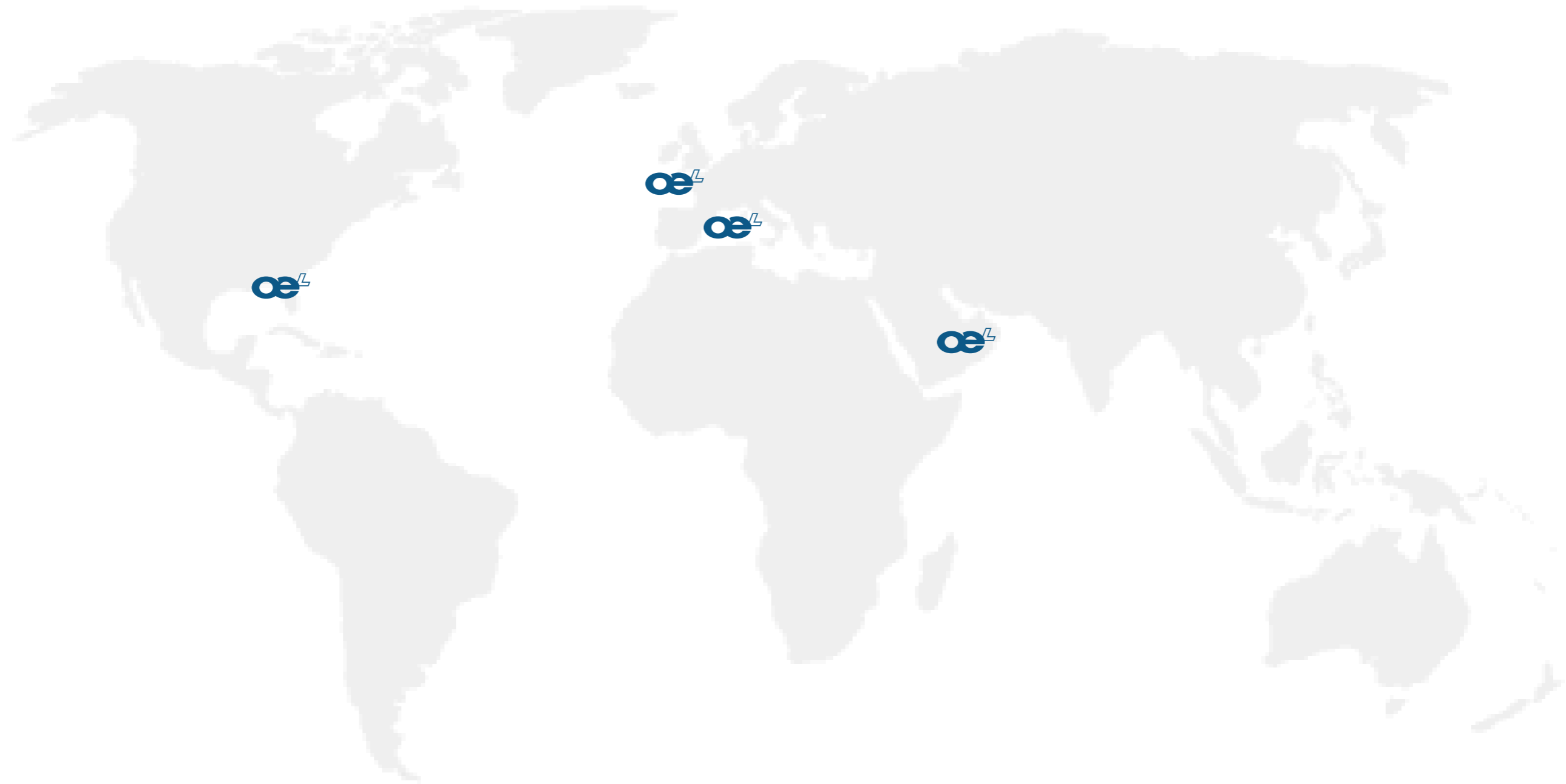
Failure Analysis and Upgrades

TPS's procurement and engineering excellence enables rapid solutions to unscheduled breakdowns and repairs. Our extensive knowledge of ancillary components allow us to track repeated failures and develop solutions and upgrade options.

Reverse Engineering

TPS's engineers are able to offer continued support for obsolete product through a programme of reverse engineering and testing. This allows TPS to offer an alternative to OEM products, combating lead times in the event of a breakdown.





Discover a world of excellence

Osborne Engineering Ltd

Atley Way, North Nelson Industrial Estate,
Cramlington, Northumberland, NE23 1WA,
United Kingdom

T: +44 (0) 1670 737 077
E: info@oel-group.com

Osborne Engineering LLC

Dubai Investment Park 2,
Dubai, United Arab Emirates

T: +971 (0) 4883 3310
E: info@osborne-engineering.ae

Osborne Engineering Sp. z.o.o.

ul.Rogowska 117a, 54-440 Wrocław,
Poland

T: (+48) 71 795 50 00
E: info@osborne-engineering.com.pl

Osborne Bearing Technologies LLC

7901 Hansen Rd Building 3,
Houston, Texas 77061,
United States

T: (+1) 713 904 1234
E: InfoOBT@oel-group.com

Osborne Training Services

Atley Way, North Nelson Industrial Estate,
Cramlington, Northumberland, NE23 1WA,
United Kingdom

T: +44 (0) 1670 737 077
E: ots@oel-group.com

Turbo Power Services

Atley Way, North Nelson Industrial Estate,
Cramlington, Northumberland, NE23 1WA,
United Kingdom

T: +44 (0) 1670 737 077
E: sales@oel-group.com

Turbo Power Services UAE

Oilfield Supply Centre, Unit 38,
PO BOX 30703, Jebel Ali, Dubai,
United Arab Emirates

T: +971 (0) 4883 3310
E: info@osborne-engineering.ae

www.oel-group.com