



Services

Peak performance & uptime for APAC FPSO operations



Keeping FPSOs producing at peak performance — more uptime, less surprised

FPSO operators today face a unique set of challenges. As offshore assets age, operators are under increasing pressure to maximize production availability, extend equipment life, reduce operating costs, and meet growing sustainability expectations, all while managing limited maintenance windows and increasingly constrained resources. With vessels always on the move, response time and availability for technical support can be tricky as well.

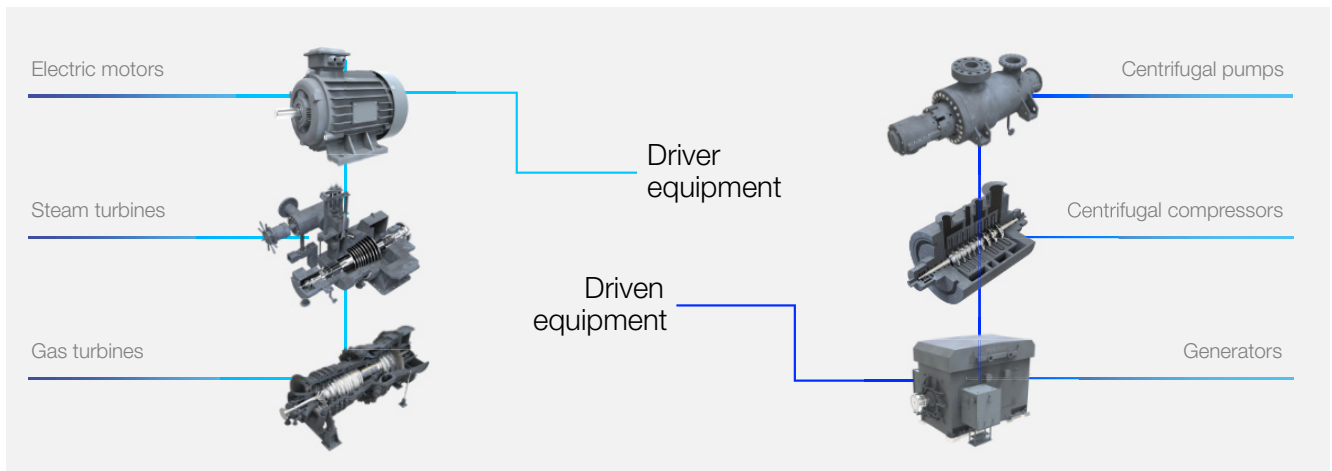
In this environment, uptime is everything.

Whether driving gas compression, power generation, seawater injection, crude export, or utility services, rotating equipment forms the backbone of every FPSO operation. Maximizing the availability and performance of these assets is essential to protecting production, reducing lifecycle costs, and ensuring long-term asset integrity.

At Sulzer, our global service network of over 100 service centers partners with FPSO operators to deliver end-to-end rotating equipment solutions that enhance reliability, extend asset life, and unlock greater value from existing assets. Through a combination of advanced engineering, digital diagnostics, repair expertise, and OEM-agnostic support, we help keep offshore production moving, wherever and whenever it matters most.



Comprehensive rotating equipment service coverage



Rotating equipment is the operational backbone of your vessel, regardless of the maintenance cycle, we have the right our service solution to support your operational performance and uptime goals

Routine maintenance

Annual shutdown

Major maintenance

Decommissioning

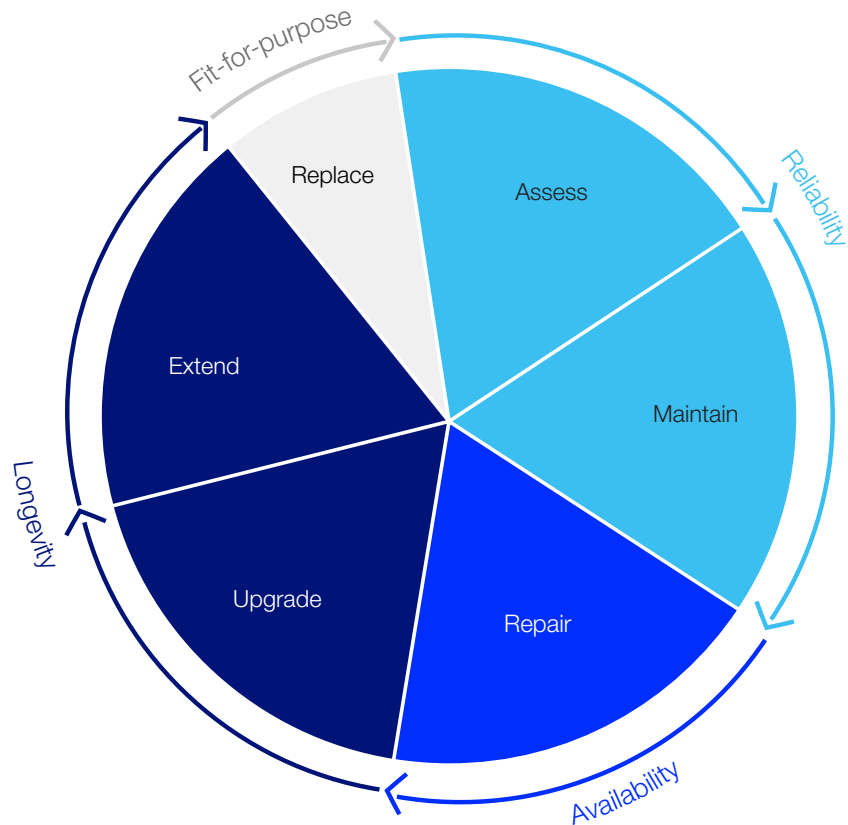
Life-extension

Major asset
integrity campaign



Supporting the entire FPSO lifecycle

Sulzer recommends an active asset management strategy for uptime, performance, production and reliability safeguards. Mitigate OEM associated high costs, lead-time and capacity limitations with our local services and responsive support. Tap into our expertise to maintain your assets' integrity with significant benefits from reduced OPEX, safety to life-extension and more.



Snapshot of equipment lifecycle offerings

Assets	Maintain	Repair	Upgrade	Extend	Replace
Minor & Major inspections	Minor & Major overhauls		Reverse engineering	Life-extension programmes	Pump
Remote monitoring		Advanced repairs	Retrofit	Long term service agreements	Small motors
Advanced Diagnostics		Parts supply	Materials		Parts & components
Life assessment	Preventive maintenance	Controls			Commissioning
Root-cause analysis	Predictive maintenance				Unit removal and replacement

General mechanical services, Field Services,
Industrial technologies; Coatings, Additive manufacturing, SAW, LMD
Digital technologies; BlueBox, PumpWise

The Sulzer advantage



Supply chain

Our established supply chain means that we've got your back for all your parts re-supply, re-design and fast-tracked requirements. We manufacture industry leading high voltage coils, pump components and source components to customers globally. Eg. Have your FPSO dry-docked in Singapore for refurbishment and receive your parts at near operating basin later.



Proximity and availability

With our network of 19 service centers in APAC and an established workforce of engineers and technicians across the region, we have the servicing capacity to ensure that you get the support when you most need it, rapidly.



Customer-first

Our approach to partnership puts customers at the center of our solutions. We have built our offering to respond rapidly when it matters most.. The same rings true for proactive lifecycle management of machines. We deliver the same speed and quality for both planned and reactive maintenance.



OEM-agnostic expertise

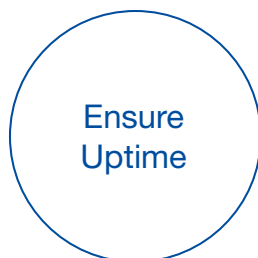
Sulzer is home to a wide range of rotating equipment experts, who together make us a highly competent and reliable partner for mission-critical equipment. Their experience across multiple OEM designs, together with their knowledge of base principles and 'real world' operating conditions and environments, is a compelling combination that delivers real solutions.



Global approach & local presence

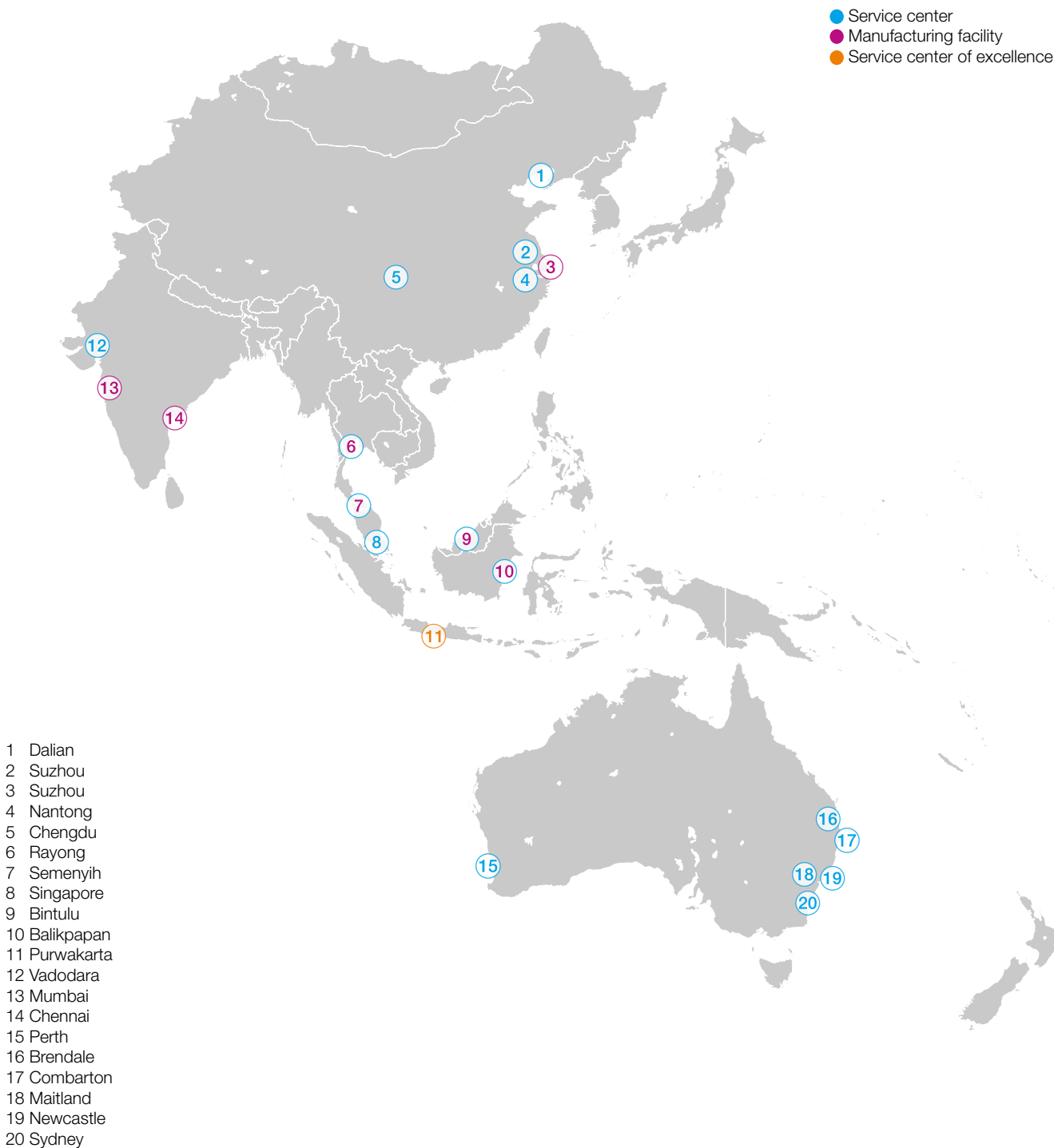
Our local service centers supported by our global Centers of Excellence, mean we can act quickly for customers and 'execute everywhere', while maintaining the highest standards of quality. Leverage our depth and breadth of rotating equipment expertise globally for the most complex requirements while our local experts offer responsive support, on-site and workshop services for your reliability requirements.

Your goals, our commitment



Our regional service network

Regardless of where you dock across APAC, there's always a Sulzer service center in proximity



Case study: Sulzer's extensive network makes light work of BB3 pump retrofit & motor overhaul

Location: Australia & Singapore

Customer: Australia FPSO

Key Services: Pump retrofit, repair, reverse engineering, motor overhaul



Challenge

- Reliability of 2 PWRI pumps onboard was lower than expected where water injection process contained solid sand particles
- Pumps' mean time between repair (MTBR) was initially 24 months and was reduced due to change in process with MTBR reduced to 6 months over the years.
- Performance declined with rapid degradation of mechanical efficiency.
- Root cause analysis also showed that the highest wear was at the centre bush, impeller hub and eye wear ring locations
- The FPSO vessel also required support on the removal of an old 2MW, 11kV Siemens motor while simultaneously installing and commissioning a brand-new identical piece of the machinery.

Solution

- Sulzer's global network of experts and service centers collaborated to deliver the retrofit solution
- Our Suzhou (China) team were tasked with the overall solution design. The multi-faceted solution comprised of modification of internal geometries, ensuring a smoother flow and allowing particles to follow the fluid streamline more closely, resulting in reduced turbulence and thus reducing erosion.
- A tungsten carbide-based coating SUME, specially developed for sand abrasion within pumps on water injection duties, was used for coating of the impellers and wear parts to provide high wear resistance and anti-galling properties. This was fulfilled by our service centre in the UK
- Wear rings were upgraded to ceramic material for further wear and abrasion resistance
- One of the pumps was upgraded in Singapore when the FPSO was in dry dock in Singapore and the subsequent pumps

were upgraded at Sulzer's Perth service center when the vessel was back in operation in Australia

- The perth service center delivered a full inspection, repair and testing of the 6.6 kV motor, replacing critical components and remanufacturing the terminal box to improve operational reliability.

Impact

- Proximity and availability of service centers ensured seamless supply chain and delivery of the solution.
- The pump regained substantial performance improvements with reduced power consumption
- 2 years post repair, customer's feedback determined that the pumps' lifetime increased substantially by 5 times

Case study: Discontinued compressor overhauled for life-time extension

Location: Vietnam

Customer: Vietnam NOC

Key services: Compressor overhaul, parts supply



Challenge

A polygon fit compressor was due for its routine overhaul. Inspection of the compressor revealed the need for extensive refurbishment across both rotating and stationary components. Critical wear areas required restoration, including:

- Interstage sleeves, labyrinth sleeves, stopper sleeves, and inner labyrinth seal sleeves requiring replacement.
- Impeller bores and impeller eye sealing surfaces requiring machining and coating restoration.
- Bearing journal surfaces requiring HVOF coating repairs.
- Radial and thrust bearings requiring rebabbiting or replacement.
- Labyrinth seals, oil seal rings, center keys, bearing housing pins, and other stationary components requiring manufacture or refurbishment.
- Full rotor integrity verification, balancing, and clearance restoration to meet API and OEM requirements.

Solution

Sulzer executed a complete compressor overhaul program, including:

- Manufacturing new rotor components such as six interstage sleeves, middle labyrinth sleeve, stopper sleeves, inner labyrinth seal sleeves, and associated sealing elements.
- Restoring bearing journal and impeller eye surfaces using HVOF tungsten carbide and chrome carbide coatings followed by precision machining and grinding.
- Machining and refurbishing impeller bores and thrust collar surfaces.
- Rebabbiting thrust and radial bearings and manufacturing a new radial tilt-pad bearing.
- Manufacturing new labyrinth seals, oil seal rings, center keys, and bearing housing pins.
- Performing extensive dimensional inspections, runout measurements, electrical runout verification, dynamic balancing, residual unbalance testing, and assembly clearance checks.

- Conducting comprehensive NDT inspections (MT, PT, UT) on rotor, stator, bearings, seals, and casing components to verify mechanical integrity before assembly.

Impact

The compressor was returned in a fully assembled, inspected, balanced, and validated condition, supporting reliable continued operation while extending equipment life and avoiding the cost and lead time associated with major component replacement

Case study: Fast-tracked repair and overhaul of 3 pumps

Location: Singapore

Customer: Australian Energy Major

Key Services: Pump overhaul, Installation & Removal, Advanced repair



Challenge

- Three critical fire water pumps onboard the FPSO were found in degraded condition during detailed inspections delivered by the Singapore service center team as part of the routine overhaul.
- Comprehensive dismantling and dimensional assessments identified extensive wear, erosion and deterioration across multiple rotating and sealing components, including bearings, shaft sleeves, retainers, seals, wear rings, fasteners and bearing housings.
- Several components were assessed as non-serviceable and required replacement and urgent repair to meet tight window for installation back onboard

Solution

Key refurbishment and repair scope includes:

- Detailed inspection and condition assessment of all rotating and stationary components.
- Replacement of worn bearings, seals, O-rings, wear parts, fasteners and other non-serviceable components supported by Sulzer's established supply chain.
- Refurbishment and recovery of salvageable components through cleaning, dressing and machining to be delivered by
- HVOF tungsten carbide restoration and precision machining of shaft sleeves on the to recover damaged surfaces and restore dimensional integrity on urgent basis
- Reassembly, final inspection commissioning support onboard

Impact

The overhaul programme restored all three fire water pumps to service-ready condition, improving operational reliability and ensuring continued availability of a critical fire protection system.

- All rotors successfully balanced and certified to ISO 1940-1 G2.5 requirements after corrective balancing.
- Critical rotating equipment clearances, concentricity and dimensional tolerances were verified and restored.
- Damaged and worn components were repaired, refurbished or replaced to extend equipment service life.

Case study: Life-extension assessment for Steam turbine train

Location: Vietnam offshore

Customer: International O&G Major

Key Services: Condition assessment, steam turbine, gearbox and generator inspection



Challenge

A 1.5 MW steam turbine generator aboard a 660k barrel FPSO had been shut down close to a year and required a comprehensive condition assessment to determine its reparability and asset integrity. Visual inspection revealed extensive deterioration throughout the rotating train, including:

- Severe corrosion on turbine casings, diaphragms, rotor components and bearing surfaces.
- Rotor blade thinning, heavy pitting corrosion and material loss across multiple stages.
- Two broken blades and two missing shrouds on the Stage 7 rotor.
- Corrosion and scratching on journal bearings and thrust bearing components.
- Hydraulic leakage in the governor system and corrosion on steam valve assemblies.
- A generator that had reportedly operated for approximately 40 years without a major overhaul.

Adverse operating environment accelerated degradation on the unit due to steam leakage.

Solution

With the assessment completed, the right cause of actions will determine the effectiveness of the life-extension programme.

Sulzer's engineers recommended an extensive refurbishment and life-extension programme with the following scope:

- Complete inspection and NDT examination of turbine casings, diaphragms, bearings and auxiliary systems.
- Replacement gland packing seals, diaphragm seals, keys and associated hardware.
- Full rotor rehabilitation involving de-blading, rotor inspection, bearing journal restoration and installation of new rotor blades across all seven stages.
- Dynamic balancing, runout verification and dimensional validation of rotating components.
- Overhaul of the governor system and gearbox inspection
- Comprehensive testing of generator rotor, stator and bearing systems, including electrical inspections and condition assessment.

Impact

- The proposed overhaul strategy established a clear roadmap for extending the operating life of a critical FPSO power generation
- The assessment ultimately enabled the customer to evaluate the targeted refurbishment recommendations and to undertake a effective cost-benefit analysis comparison with a replacement option taking into consideration on lead time and the FPSO's operational needs.



The Sulzer Services division is your partner for uptime and enhanced performance for your rotating equipment and more. Our dedicated people provide unrivalled service and expertise to meet your operational needs – anytime, anywhere.

Through a network of over 100 service sites around the world, Sulzer provides cutting-edge parts as well as maintenance and repair solutions for pumps, turbines, compressors, motors and generators. We service our own original equipment, but also all associated third-party rotating equipment run by our customers, maximizing its sustainability and life cycle cost-effectiveness. Our technology-based solutions, fast execution and expertise in complex maintenance projects are available at our customers' doorsteps.

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