

Turbomachinery Engineering

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Turbomachinery Engineering

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Parts supply and overhaul of Steam Turbines



Turbomachinery Engineering, incorporating Allen Steam Turbines, specialises in the manufacture of spare parts, field overhaul and workshop repair of steam turbines and high-speed, centrifugal/axial gas compressors.

Field overhauls and shutdown management

We aim to minimise machine downtime so that when shutdowns are planned in advance our project managers can work with your operations and maintenance staff to:

- Develop risk assessments
- Create detailed method statements and inspection criteria
- Quantify manpower needs to reduce downtime
- Review special tooling requirements
- Identify spare parts requirements and manufacture and source these in advance

Techniques such as boroscope inspection and full spectrum vibration analysis are also available to assess the condition of a machine's internals, often eliminating the need to remove the top half cylinder and rotor. This technique augments shutdown planning by ensuring that resources are directed to the critical machines that most need attention.

Typical steam turbine rotor showing both shrouded and wired blading arrangement.

Overhaul of machine internals on Allen turbine and gearbox.



31MW Allen Steam Turbine installed at Møljervaerket Combined Heat and Power Plant in Denmark during overhaul.

Where breakdowns occur we will mobilise at short notice allowing work to begin promptly without compromising safety or the service quality.

Whether repairs are planned or arise from a breakdown, our field service maintenance activities are fully supported by our specialist service centres which are available 24 hours a day, 365 days of the year.

Workshop repairs

Workshop repairs are carried out at our specialist facilities in Barton-on-Humber and Bedford, manned by fully qualified engineers experienced in high-speed turbomachinery repair. Our workshops support on-site activities while flexible work patterns ensure fast turn-round times.

Repair scope can range from standard overhauls on turbines and auxiliaries through to the application of specialist component repair and rotor re-blades, underpinned by our team of design and technical support engineers.



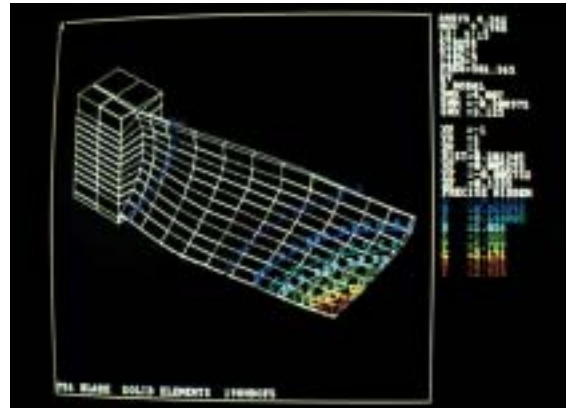
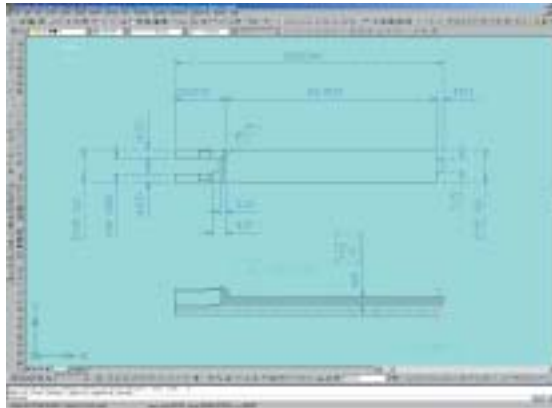
2 LP stages of a 6MW Daniel Adamson turbine being manufactured for a UK fertiliser plant.

Workshop inspection of a 12MW AEI turbine for a UK based power producer.

World class design coupled with expertise in the fields of aerodynamics, rotordynamics, mechanical design and materials technology will improve equipment reliability and availability.

Full manufacturing drawings are produced and approved for all re-engineered components before manufacturing begins.

Example of 3D graphic blade stress analysis.



Boroscope inspection can reduce turn-round times and even eliminate the need for major overhaul.

Computational Fluid Dynamics (CFD) being applied to assess pressure contours across LP blading.

Full frequency vibration analysis can be conducted on site and compared with first principles rotordynamic studies to diagnose and resolve operating problems.

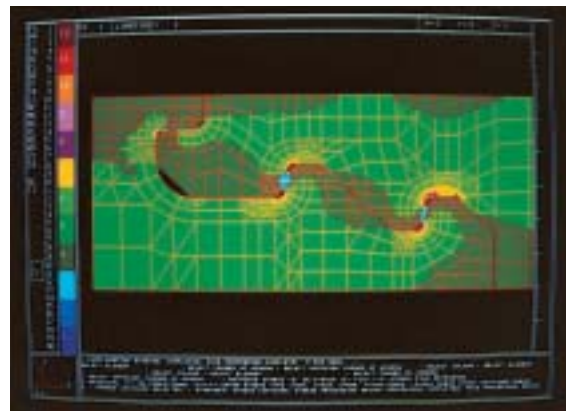
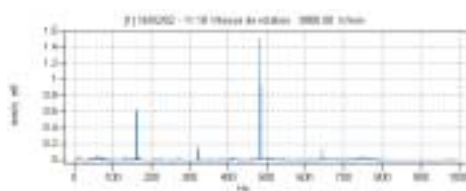


Upgrading and re-rating plant

Whether it is to understand the nature of a machine's operating condition, engineer out inherent design problems or fundamentally change a machine to suit new steam conditions our engineers have the experience and design skills to offer a solution.

Our expertise covers the broad spectrum of Turbomachinery design and analysis. The full resource available from Weir Turbomachinery covers the following areas:

- Dynamics & Structural Engineers
- Aerodynamic and Thermodynamic Engineers
- Noise & Vibration Specialists
- Mechanical Design Engineers
- Materials Engineers



Our noise and vibration specialists will undertake on-site trouble shooting which may involve in-situ balancing or might identify areas of concern to be rectified at the next outage. Where inherent problems exist our dynamics, mechanical design and materials specialists will work with you to optimise an engineering solution.

These disciplines can be integrated to provide a complete re-rate service for steam turbines whether it is to up-rate or de-rate an existing machine for modified steam conditions, either for the same site or where a machine is being relocated.



Irrespective of a turbine's age or manufacturer we have the skills and technology to support the spare parts needs of our customers across the globe.

Inventory management & spare parts supply

To augment field or workshop overhauls we can replenish spare parts with either OEM or re-engineered components made with meticulous attention to detail and allied to more than 100 years' experience in the design and manufacture of high speed rotating machinery.

Re-engineered components can be manufactured at short notice in circumstances where the original manufacturer is either no longer able to supply parts or offers an unacceptable lead-time.

Where premature corrosion or erosion are evident, our material technology centre will review the original design and propose alternative materials and configuration to extend component life.



Weir designed water lubricated turbine (TWL) wheel for a naval application.

Linde cryogenic radial turbine during manufacture.

Fabricated diaphragm assembly during manufacture in our UK production facility.



Re-engineered Elliot turbine rotor for a Caribbean petrochemical producer.

Re-engineered Mitsubishi nozzle and reversing segment for a marine cargo pump drive.

Fabricated diaphragms for an Allen Steam Turbine in the Middle East.

