

Services and Expertise for OEM

	Turbomachinery Steam Turbines	Turbomachinery Gas Turbines	Aero Turbines
Power Plants / Industry			
R & D / Turbine Design			
Risk analysis and management	X	X	X
Method development for thermodynamic cycles	X	X	
Process engineering	X	X	X
Mechanical integrity analysis tools	X	X	X
Design of advanced flow paths and 3D Blading (axial and radial)	X	X	X
Optimizing air cooled condensers for ambient wind condition, air cooled condenser heat exchangers and the cooling flow path for large hydro generators.			
Aerodynamic Design & Optimisation			
Design of advanced flow paths and 3D Blading	X	X	X
Axial and radial compressor design		X	X
Inlet nozzle, seals, cavities, cooling passages, diffuser)	X	X	X
Control stage	X		
1D, 2D and 3D flow simulation, steady state and transient	X	X	X
Multiphase flow simulation (equilibrium and non-equilibrium phase change modelling)	X		
Heat transfer modelling	X	X	X
Developing loss models using CFD	X	X	X
Support for experimental flow testing	X	X	X
Mechanical Integrity			
Mechanical Design & Optimisation	X	X	X
Mechanical integrity analysis (blades, rotors, casings, etc)	X	X	X

	Turbomachinery Steam Turbines	Turbomachinery Gas Turbines	Aero Turbines
Power Plants / Industry			
Design for standardization & modular systems according applicable directives, norms & standards (ATEX, PED, API, EC,...)			
Turbomachinery and Field-testing Support			
Blade testing	X	X	
Design of test rig including instrumentation	X	X	
Support establishing test procedure	X	X	
Attend and support direction of tests	X	X	
Analyse test data	X	X	
Root Cause Analysis			
Support extraction of engine data	X	X	X
Analyse data, identify root cause and recommend actions	X	X	X
Health Monitoring			
Recommend additional engine instrumentation	X	X	X
Provide in-house developed gas path analysis software to analyse engine data and report location in turbomachinery of performance deterioration	X	X	X
In-house Tools			
AirFoil Designer pdesk® for gas and steam turbine blades	X	X	X
Radial compressor design tool		X	
1D design tool for steam turbine (including cycle)	X		
2D design and analysis tool for gas and steam turbines	X	X	
3D analysis tool for gas and steam turbines (including cooled blades)	X	X	X
parametrised 3D CAD blade generation with root and shroud (incl. Fillet radius)	X		

	Turbomachinery Steam Turbines	Turbomachinery Gas Turbines	Aero Turbines
Power Plants / Industry			
Combustors (Gas, Oil and Multi-fuel)		X	X
Combustor concept and design		X	X
Optimisation for fuel flexibility		X	X
Detailed chemistry modelling		X	X
Aerodynamic Modelling & Optimisation		X	X
2D and 3D flow simulation, steady state and transient		X	X
Fuel modelling (single and multiphase flow)		X	X
Combustion modelling		X	X
Emission modelling		X	X
Flame stability & flashback modelling		X	X
Heat transfer modelling		X	X
Combustor and Field-testing Support			
Design of test rig including instrumentation		X	
Support establishing test procedure		X	
Attend and support direction of tests		X	
Analyse test data		X	
Root Cause Analysis			
Support extraction of engine data		X	X
Analyse data, identify root cause and recommend actions		X	X

Services and Expertise for Power Plant & Hydro Power Plant Operators

General

Development of monitoring & diagnosis software

Software development for industrial automation systems

Signal processing and estimation optimization

Data analysis and image processing

Smart sensor /smart devices planning and implementation

Software engineering

Database design

Development of “Industrial Internet of Things”.

Monitoring, Diagnosis & Analysis

Gas Path Analysis

Performance Monitoring and Diagnosis for Gas and Steam Turbines

Vibration and damping analysis

Power plant behavior analysis and modelling

System analysis and model-based control

Root Cause Analysis & Life Time Extension

Root cause analysis

Hydro Power

Efficiency measurements in any type of hydro power plants

Fluid structure interaction

Flow induced vibration

Discharge measurements

Hydro power plant optimization

Trouble shooting in hydro power plants

Heading research projects