

## Aero engines

### Performance Analysis, Design, Testing and Validation Engineering and Industrial Services

We offer end-to-end engineering solutions covering concept design to product realisation and support through product life cycle, on aero engines and derivatives including all major subsystems/accessories. Our expertise in various domains have resulted in long standing engineering and IT business relationships with our clients. Our clientele from civil and defence sectors include OEMs and MRO service providers of aero, industrial and marine gas turbines. Consequently, we fulfil the high technology, high quality, safety critical and demanding engineering needs of our clients.

#### Offerings

##### Concept/ Performance Analysis

- Aero Thermodynamic Cycle
- Engine parameters optimization
- Design and Off - Design
- Aerodynamic Studies for
  - Fan - Compressor - Combustor
  - Turbine - Nozzle - Nacelle

##### Manufacturing Support

- Tool Design and Manufacture
- Process Planning
- CAM/NC Support & Digital manufacturing
- Composites & Tooling
- Ground support equipment
- Engine Assembly & Dis assembly tools
- Machining Jigs and Fixtures
- Inspection gauges
- Wire Harness tools
- Assembly Process
- Sourcing support

##### Design & Analysis

- Detail Design
- Digital Mock up
- Finite Element Analysis
  - Static - Dynamic - Kinematics
  - Thermal - CFD
- Piping and Routing layouts
- Harness Design
- Weight Optimization
- Design Optimization

##### Engineering IT

- CAD/CAM/CAE Application/ Customization
- PLM Implementation
- Organizational Deployment
- GIS
- Custom Applications
- Engineering Automation
- Engineering Portals
- CAD Translation
- IT System Integration
- Knowledge Based Engineering

##### Testing & Validation

- Design of test rigs
- Design of Test beds
- Design of Engine intakes (Ground test)
- Test Data Analysis for
  - Fan - Compressor - Combustor
  - Turbine - Nozzle - Nacelle
- Test Data Analysis and Performance verification for
  - New Engines
  - In Service Engines (Serviced & Overhauled)
- Production/ Development Engine testing support
- Performance reports & Graphs
- Engine Test Bed calibration

##### After Market Service

- Technical Publications
- CIR Manuals
- Integrated Parts Catalogues
- Helpdesks
- MRO Support services

## Technology Skills

### CAE

- NASTRAN
- ANSYS
- MOLDFLOW
- PATRAN
- P3 THERMAL
- MATLAB
- HYPERMESH
- LS DYNA
- Pro/Mechanica
- Flotran
- I-DEAS
- ABAQUS
- Fluent
- CFX-TASCflow

### CAD

- CATIA
- UNIGRAPHICS
- CADD55
- Pro/E
- IDEAS
- MICRO CADAM
- AutoCAD 2000
- SolidWorks
- SolidEdge
- HELIX
- Euclid

### CPC/PDM

- TeamCenter Engineering
- TeamCenter Enterprise
- WINDCHILL
- e MATRIX
- ENOVIA
- MySAP PLM

### KBE

- UG/Knowledge Fusion
- CATIA/CAA

## Skills & Competencies

### Expertise

- Performance Analysis
- Design & Analysis
- Modeling & Drafting
- Test Data Analysis
- Test Cell Calibration
- Requisition Engineering
- Instrumentation

### Systems

- Aero Engines
- Industrial Gas turbines
- Marine Gas turbines
- Wind Turbines

## People

### Highly qualified associates with rich expertise in sub systems and domains

- Aero Thermodynamic Performance & Test Cell Calibration
- Bumper - Thrust Reverser
- Compressor
- Exhaust /After Burner
- Fan
- Nacelle
- Rotor System
- Turbine

## Alliances

### Product

Ansys, Dassault Systemes, Moldflow, PTC, Siemens PLM Software

### Academic

Indian Institute of Science (IISc), Indian Institute of Technology APDAP

### Industry

DARE(DRDO), National Aerospace Laboratories, Hindustan Aeronautics Ltd.

## Clients

Avio  
GTRE (DRDO)

Pratt & Whitney  
Rolls Royce

Goodrich Inc.  
HAL

Contact us at [corporate.engineering@tcs.com](mailto:corporate.engineering@tcs.com) to know how we can help you achieve this.

All content / information present here is the exclusive property of Tata Consultancy Services Limited (TCS). The content / information contained here is correct at the time of publishing. No material from here may be copied, modified, reproduced, republished, uploaded, transmitted, posted or distributed in any form without prior written permission from TCS. Unauthorized use of the content / information appearing here may violate copyright, trademark and other applicable laws, and could result in criminal or civil penalties.

Copyright © 2007 Tata Consultancy Services Limited

## About Tata Consultancy Services (TCS)

Tata Consultancy Services is an IT services, business solutions and outsourcing organization that delivers real results to global businesses, ensuring a level of certainty no other firm can match. TCS offers a consulting-led, integrated portfolio of IT and IT-enabled services delivered through its unique Global Network Delivery Model™ recognized as the benchmark of excellence in software development.

A part of the Tata Group, India's largest industrial conglomerate, TCS has over 100,000 of the world's best trained IT consultants in 50 countries. The company generated consolidated revenues of US \$5.7 billion for fiscal year ended 31 March 2008 and is listed on the National Stock Exchange and Bombay Stock Exchange in India. For more information, visit us at [www.tcs.com](http://www.tcs.com)