We provide state-of-the-art system solutions across the spectrum of civil and military avionics to aerospace prime suppliers, OEMs, and defense majors, covering safety and mission critical software, hardware, firmware development and electronics manufacturing. These solutions typically involve new product design support, extensive modeling, simulation, design and development, testing, and certification support till flight trials.

Tata Consultancy Services (TCS) has four major delivery centers in North America and three in UK and Europe to bring you near-site delivery capability. This includes centers like TCS Peterborough in UK and TCS Cincinnati in North America to handle ITAR/EAR related work.

Avionics Engineering and Industrial Services

Avionics systems experience

Systems (civil aircrafts):
- Landing systems
  - Nose wheel steering
  - Flap actuation
  - Brake-by-wire
- Control systems
  - Auto-pilot
  - Engine data concentrator
  - Cabin pressure
- Fuel quantity management
- Core avionics computer

Displays
- ECAS
- iSFD

Systems (military aircrafts):
- Navigation
  - Mission computer
  - GPS

Ground-based systems:
- Command and control systems
  - Cargo simulator
  - Fuel system analysis system
  - Flight data acquisition and analysis system

Offerings

- Full software development lifecycle projects as per DO-178 B (Level A through D)/MIL-STD-498
- Independent verification and validation as per DO-178B (Level A through D)
- Certification support (audits, documentation)
- Hardware design from specifications to prototyping, meeting DO254 guidelines up to Level A
- Complex system integration testing on rigs/aircraft and flight test data analysis
- Simulator/test rigs/PC-based test equipment Development: software, hardware, and mechanical assemblies
- Manufacturing support for electronics, cardcages, wiring harnesses, and cabinets
- Modeling and simulation using formal methods
- Technical publications

People

- Highly qualified associates with embedded systems/real-time systems domain expertise
- Dedicated core avionics domain experts (via Avionics CoE)
- Consultants with extensive experience of working on major avionics systems
Some avionics programs executed

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Project</th>
<th>Certification Level</th>
<th>Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nose wheel steering/flaps actuation system SW IV&amp;V</td>
<td>DO178B level B</td>
<td>Business jets</td>
</tr>
<tr>
<td>2</td>
<td>Fuel quantity measurement system/ main engine data concentrator SW IV&amp;V</td>
<td>DO178B level A/B</td>
<td>Large civil aircraft</td>
</tr>
<tr>
<td>3</td>
<td>EICAS SW development and IV&amp;V</td>
<td>DO178B level A</td>
<td>14 seater civil aircraft</td>
</tr>
<tr>
<td>4</td>
<td>Auto-pilot SW IV&amp;V</td>
<td>DO178B level A</td>
<td>14 seater civil aircraft</td>
</tr>
<tr>
<td>5</td>
<td>Mission computer SW integration testing, flight test data analysis</td>
<td>MIL498</td>
<td>Fighter aircraft</td>
</tr>
<tr>
<td>6</td>
<td>FPGA design for iSFD</td>
<td>DO254 level B</td>
<td>Civil/military</td>
</tr>
<tr>
<td>7</td>
<td>Analog circuit design for brake-by-wire system</td>
<td>DO254 level A</td>
<td>Business jet</td>
</tr>
<tr>
<td>8</td>
<td>PCB design for aerospace and defense applications</td>
<td>Customer standards</td>
<td>Civil/military</td>
</tr>
</tbody>
</table>

Certification
- AS9100 Rev B (compliance to As9006)
- CMMI Level 5

Technology skills

**Requirement analysis**
- DOORS
- RHAPSODY
- SCADE
- RATIONAL REQUISITE PRO

**Design and architecture**
- Team Work
- SCADE
- MATLAB/SIMULINK
- RATIONAL ROSE

**Development/coding**
- ADA 83/95
- ANSI C
- C++
- ASSEMBLY LEVEL
- OPEN GL
- GREEN HILL IDE
- Code Warrior
- Code Composer Studio

**Hardware design tools**
- Cadence – Orcad
- Zuken – Cadstar
- Mentor – Expedition
- Board Station

**Verification and validation**
- CANTATA++
- LDRA
- Ada TEST
- RTRT
- VECTOR CAST
- ASSENT MISRA C

**RTOS**
- VxWorks
- QNX
- pSOS
- Open VMS
- Solaris
- Windows

**Communication protocols**
- ARINC 429/629
- MIL 1553B
- RS 422/232
- CAN
- AFDX
- TCP/IP

**Configuration management**
- Rational Clear Case
- MS VSS
- Rational Clear Quest
- PVCS
Why TCS

- Quality driven by robust internal process guidelines
- Comprehensive capabilities (end-to-end solutions, both hardware and software)
- Quick ramp-up capability
- R&D center focusing on in-house development of software tools, and processes that aim for zero-defect products, increased productivity, and reduced time-to-market
- Near-site delivery centers in North America, UK, and Europe

Alliances

HAL, NAL, TATA Advanced Materials, TAL, IISc Bangalore.
Contact
To know more about, contact corporate.engineering@tcs.com

About Tata Consultancy Services (TCS)
Tata Consultancy Services is an IT services, consulting and business solutions organization that delivers real results to global business, ensuring a level of certainty no other firm can match. TCS offers a consulting-led, integrated portfolio of IT and IT-enabled infrastructure, engineering and assurance services. This is 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 a global footprint and is listed on the National Stock Exchange and Bombay Stock Exchange in India.

For more information, visit us at www.tcs.com

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