



It takes a lot of technology  
to deliver comfort at 30,000ft,  
We make travel smoother

## AEROSPACE & DEFENSE

HCL ENGINEERING AND R&D SERVICES



## The Environment Today

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Despite an upsurge in demand for air travel, airlines are having trouble maintaining profitability. They must provide passengers with the right experience at the right price point while ensuring higher utilization of capital-intensive equipment. Technology is playing an increasingly crucial role in addressing these objectives.

Having pioneered offshore engineering services in this industry more than a decade ago, we have become the largest dedicated aerospace practice in India and the preferred engineering partner for new aircraft programs across the A&D ecosystem, offering application management services, infrastructure support, testing, and new-product development. In the past decade, we've successfully executed projects in various subdomains and have partnered on all major commercial aerospace programs.

# System and Subsystem Exposure

**Flight Controls & Actuation**

**Cabin & Interiors**  
IF, Cabin Electronics,  
Monuments, F2F, Seats

**Flight Management System**  
**Flight Warning System**

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**Display System**  
**Crew Alerting System Com,**  
**Navigation, Surveillance**

**Landing Gears**  
**Wheels & Brakes**

**Sensors &**  
**Integrated Systems**

**Engine &**  
**Control Systems**





**Fire Protection  
Systems**

**Hydraulics**

**Aerostructures**

**Fuel System**

**Electrical Systems**

**Environmental Control &  
Air Management System**

# Aerospace & Defense Service Offering



## Embedded SW Engineering

- Complete life cycle support for safety critical on-board software
- In house Aerospace specific Quality Framework – AQMS, RTCA DO 178 and MIL standards



## Electronics

- ASIC /FPGA /SoC Design, Board design, Verification and Design Analysis. Obsolescence management (FPGA, PLAs, DSPs and DO 254 Stds.etc)
- Complexity FPGA with 3 million gates, PCB Designs up to 26 Layers, 800MHz Bus Speeds
- Alliances with vendors for EDA, IP/DESIGN / FPGA / FOUNDARIES



## Mechanical & Structural Engineering

- Concept to Manufacturing services across Aerostructures, Aero Engines and Aero Systems
- In house Design Frameworks and Tools- OPTICOM, SEAD, RED, Value Engineering
- Centre of Excellence in Industrial Design, CAE & Reliability Analysis



## Test Engineering and ATE Solutions

- Largest Aerospace V&V practice in India
- End to End Test Engineering Solutions



# Service Line Units



## Acceleration

- eDAT

## Value

- Accelerated Functional Testing
- Performance Engineering
- VAVE

## Technology

- Product Intelligence
- Interactive Electronic Technical Manual



# HCL in Aerospace & Defense

*Work with seven of the top 10 A&D companies*

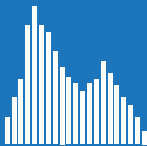
*Multiple projects executed in commercial & defense, from multiple locations including ITAR compliant centers in the US. 50+ SOI Audits performed*

*Rated #1 in Aerospace and Defense by Zinnov*

*In-house labs offering low volume manufacturing and prototyping capabilities. Dedicated teardown lab for competitive benchmarking*



*In-house IPs/Frameworks. Domain specific quality management systems (QMS) and member of DO178C committee*



*Strong team of global aerospace SMEs and domain experts. Availability of engineers across five major skills – Embedded software, Hardware, Mechanical, Manufacturing Engineering and Engineering Apps*



*Presence of 12 dedicated design centers*

*Flexible and ready to absorb Indian offset obligation (defense and civil) of global OEMs and Tier-1s. We have realized \$50M+ offsets for a leading OEM*

*\$25Mn investment into generic as well as functional labs*

# Experiences Engineered for our customers (Case Studies)

1

For a leading aerospace OEM, HCL developed software that certifies products worth more than \$30B annually. 38% of onboard software on their latest major aircraft has HCL's footprint. The multifaceted partnership also resulted in HCL being a preferred partner for R&D and offset related work. We also developed a major risk sharing agreement with them.

2

For a US based avionics major, HCL invested over \$100,000 to design, develop and manufacture a working prototype within 16 weeks from scratch. 10 new features were introduced in the process to revive product sales.

3

For an aerospace major, HCL designed the inerting systems pallet to carry three ASM cylinders and achieved a weight that was 12% below the predefined target leading to substantial cost reduction.

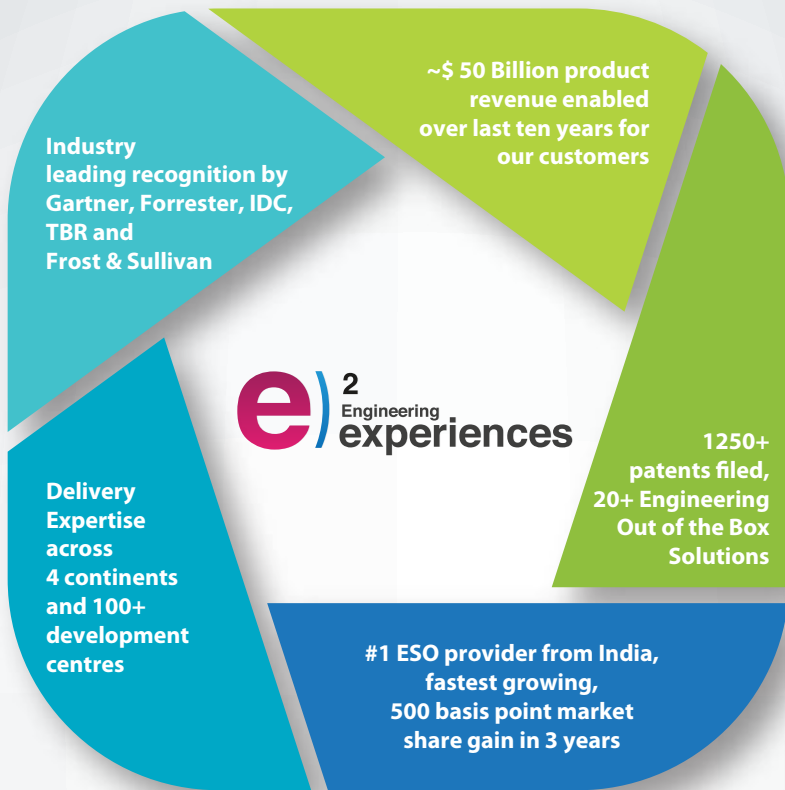
4

For an aerospace major's advance flight control system, HCL performed requirement-based testing of the enhanced digital flight control system functions to satisfy DO-178B level A,B and C requirements. Board redesign was done for a slat/flat control unit to address reliability issues and to replace components that went obsolete.



Look here





Hello, I'm from HCL's Engineering and R&D Services. We enable technology led organizations to go to market with innovative products and solutions. We partner with our customers in building world class products and creating associated solution delivery ecosystems to help bring market leadership. We develop engineering products, solutions and platforms across Aerospace and Defense, Automotive, Consumer Electronics, Software, Online, Industrial Manufacturing, Medical Devices, Networking and Telecom, Office Automation, Semiconductor and Servers & Storage for our customers.

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