

# Engine System Integration



**UTC Aerospace Systems**

# Engine Systems Integration

As a leading global provider of systems and services to the aerospace and defense industry, UTC Aerospace Systems knows engines. Through decades of experience managing engine systems, UTC Aerospace Systems has developed solid partnerships with all major engine OEMs and delivered solutions for engines of every size, type and application. Our breadth of product spans the entire engine from intake to exhaust, including actuators, airfoils and rotating components, composite structures, engine control systems, fuel nozzles and pumps, nacelles and sensors.

## Value Through Integration

For over 50 years, UTC Aerospace Systems Sensors & Integrated Systems has been at the forefront of engine innovation, delivering solutions for clean, efficient, reliable and cost-effective engine operation. Our cutting-edge technologies can be found on virtually every type of aircraft engine. As a systems integrator, we combine our advanced technologies and capabilities with those of other UTC Aerospace Systems divisions. From design of each individual product through testing and certification of an integrated system, we have the experience, skills and resources to meet the demands of your engine program.

- Seamless integration
- Simplified supply chain management
- Reduced systems risk
- On-site engineering and project management
- Joint specification development
- Relentless customer focus from product inception through aftermarket support
- Research, design and development
- Complete analysis, testing and qualification
- Full DO-160 qualification facilities
- Global MRO and aftermarket support
- Firm commitment to continuous improvement and lean manufacturing

## Total Air Temperature Sensors

- Heated (electrical, bleed air)
- Passive unheated
- Certified for ice crystal operation
- Environmentally green
- Various heater powers (e.g., 28VDC, 115VAC)
- Accuracies of  $\pm 2^{\circ}\text{C}$  ( $3.6^{\circ}\text{F}$ )

## Ice Detection & Protection Systems

- Ice detectors (magnetostrictive, optical)
- Supercooled liquid droplets
- Ice crystals
- Ice condition detectors
- Electrothermal heaters
- Anti-icing and de-icing
- Electronic controllers
- Primary automatic systems

## Oil System Monitoring

- Level (capacitive, reed switch, ultrasonic)
- Temperature
- Pressure
- Chip detection
- Quality

## FADEC & On-Engine Pressure Transducers

- Capacitive and strain gauge
- Digital and analog outputs
- Gaseous and liquid media
- $\pm 0.05\%$  FS accuracy
- 1000 PSI
- $125^{\circ}\text{C}$  ( $257^{\circ}\text{F}$ )

## Integrated Solutions

- Ignition systems
- Vibration monitoring
- Fuel flow
- Pressure switches

## Specialty Products

- Harnesses  $750^{\circ}\text{C}$  ( $1382^{\circ}\text{F}$ )
- Health monitoring systems
- Configuration plugs
- Cold junctions
- Blade erosion coatings
- Mounting brackets
- Proximity sensing

## Speed & Torque Sensors

- Shaft, blade and gear measurement
- Variable reluctance technology
- Electronic signal conditioning
- $+500^{\circ}\text{C}$  ( $932^{\circ}\text{F}$ )

## Temperature Sensors

- Platinum RTDs
- Nickel RTDs
- Thermocouples
- Optical pyrometers
- Cryogenic to combustion applications

## Advanced Sensors Technical Center



## Environmental Test Facilities



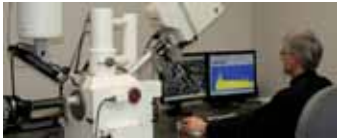
## Lean Manufacturing



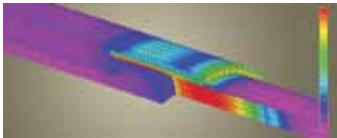
## Icing Wind Tunnels



## Product Improvement Lab



## Engineering Design & Analysis



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