Honeywell
THE POWER OF **CONNECTED**

GoDirect™ Connected Maintenance for Braking Systems

Global studies of modification, repair and overhaul (MRO) costs indicate that overall maintenance cost for the wheel and braking system comes third after powerplant and airframe structures. This is driven by the frequency at which they are replaced, inspection labor time (5-10 minutes per day per aircraft per landing adds up quickly), and parts movement (large and heavy). For example, a B737 may see as much as 47 wheel/brake replacements and move about 3.2 metric tons of parts per year for every aircraft to enable it to achieve availability targets.

Connected Braking Systems under Honeywell's Connected Aircraft program includes predictive analytics, smart monitoring modules and connectivity options to deliver quantified outcomes such as reduced landings costs, increased maintenance efficiency, and reduced impact of unscheduled downtime arising from the aircraft braking system (ATA Chapter 32).

Honeywell's Connected Braking allows an airline to:

- Receive 100% timely and accurate notifications about the aircraft braking system health by transforming existing manual procedures to an automated and digital process
- Implement fuel savings initiatives during approach, landing and taxing by optimizing the use of brakes, reversers and flaps
- Reduce operational disruptions through predictive alerting (<1% NFF) and enabling condition-based inspections and removal procedures that maximize braking life utilization
- Lower burden cost (15-20% reduction) associated with inventory and materiel planning through automated tracking of serviceable and non-serviceable wheel/brakes

Airlines can implement Connected Braking Services by:

- Downloading data from existing quick access recorders to drive trend monitoring and predictive analytics for cost savings and maintenance alerts, and/or
- Direct wear sensing using a connected caliper (available now) and/or upgrading existing braking system with smart sensing nodes (available for trials in early 2019), and/or
- Installing passive flyable ATA Spec 2000 RFID tags on the wheels for tracking its state as it moves through its lifecycle.

Services delivered under Connected Braking include predictive trending that enables planned maintenance, LRU-level prognostic alerts that minimize operational disruptions and specific recommendations for cost savings during the landing phase. These services are delivered as web services.

For an airline, the transformation from today's manual wheels-brakes related maintenance to a digitized process happens over a four-phase engagement program. The first two phases are dedicated to quantifying the value from Connected Braking using historical data and existing airline procedures. A third phase includes configuring a digital connection between the airline (aircraft recorders and repair shop ERP) and Honeywell's Connected software stack. Airline may opt for additional Connectivity options such as brake wear sensing system and edge nodes. The fourth phase allows the airlines to experience the benefits of Connected Braking for a limited period before signing a long-term contract.

Honeywell Aerospace
1944 East Sky Harbor Circle
Phoenix, AZ 85034
aerospace.honeywell.com

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