Aircraft data use in Commercial Operations

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Scale of the Future

5K Aircraft in the Sky

43K Flights per Day

2.5M People per Day
Scale of the Future

LEAP 5K PER / SEC

A380 25K SENSORS
Scale of the Future

DATA

ML

AI
The Data

Open Data
MUST be available
Supports safety and basic interoperability

Operational Data
SHOULD be available
Data every customer who buys our product would expect to have to support the operation of the product

Value Added Data
COULD be available
Provided valuable insights and intelligence for customers leveraging GE expertise and domain knowledge

Intellectual Property
Proprietary information that is how GE technology works and allows GE to manage and improve its technology
CEOD – Applied Analytics

CFM56-7B H PTR Damper Sleeve Liberation

CFM56-7B Oil Consumption Analytic
CFM56-7B HPTR Damper Sleeve Liberation
Background
CFM56-7B HPTR Damper Sleeve Liberation

- A redesign of the HPT Shaft increased stress levels on the HPTR Damper Sleeve Retention Rib. Cracks initiated at the retention rib propagates circumferentially before transitioning to axial cracking causing section liberation.

- HPTR Damper Sleeve Liberation has a tendency to drive high N2 Vibration at Low Thrust Settings – commonly seen on descent and taxi phases of flight.
Process
CFM56-7B HPTR Damper Sleeve Liberation

Measurements → Event Trigger → Customer Readiness
CFM56-7B Oil Consumption Analytic
Background
CFM56-7B Oil Consumption Analytic

• Since 2017, there have been 50+ Significant Events/Unscheduled Engine Removals due to High Oil Consumption (Oil Leaks). Leaks can start early and indicate a varying number of issues such as #3 FWD Seal Bearing Disbond / Oil System Hardware Issues.

• Current oil consumption measurement for Boeing’s 737NG (CFM56-7B) Fleet is the rolling average of oil in tanks and oil uplift at 10 minutes post engine shutdown. This process is a cost driver/maintenance burden for commercial operators.
Results
CFM56-7B Oil Consumption Analytic

Raw Data highly scattered with large number of data points with 0 qts/hr consumption.

Analytic corrects this data and closely comparable with operator's oil uplift data.