Federal Aviation Administration

Aircraft Braking Friction Research

Presented to: REDAC Sub-Committee on Airports

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Date: August 26, 2020

Aircraft Braking Friction Research

- **FAA Aircraft Braking Friction Research Initiated in Response to NTSB Issued Safety Recommendations.**
- **Big Data Analytics/Machine Learning**
- **Controlled Condition Flight Testing**

Big Data Analytics/Machine Learning

- **Big Data Analytics will Involve Comparison of Aircraft Performance Data with Data Collected External to the Aircraft.**
- **Machine Learning Model Developed to Extract Relationships Between Contributing Variables and Resultant Degraded Aircraft Braking Performance on Wetted and Contaminated Runways.**
- **FAA Has Contracted with Aviation Safety Technologies (AST) to Obtain Data From Aircraft Landings Generated over a Two Year Period (2017 and 2018).**
- **AST Data Represents Several Million Aircraft Landings Including Thousands of Friction Limited Landings.**
- **Processed Data, Weather Data, and Runway Data to be Supplied.**
- **FAA to Pursue Obtaining Additional Large Quantities of Data from Other Sources.**

Big Data Analytics/Machine Learning

- **Data Collected External to Aircraft to include Pilot Braking and Field Condition Reports (FICON NOTAMS) and Airport Surface Detection Equipment (ASDE-X).**
- **Big Data Analytics and Machine Learning Effort to be Performed by the FAA and MIT. MIT Work to be Funded Under the FAA Joint University Program (JUP).**
- **Machine Learning Working Group for Runway Friction Being Formed to Support MIT and the FAA with Analysis.**
- **Machine Learning Working Group for Runway Friction to Include Representation from the FAA, Academia, Industry Representatives with Big Data Analytics Background, and Others that are Developing Runway Braking Friction Assessment Technologies.**

Controlled Condition Flight Testing

- **Leased Instrumented Aircraft to Conduct Brake Testing on Wetted and Contaminated Runways to Assess Degraded Braking.**
- **Aircraft Brake Testing will be Complimentary to Big Data Analytics/Machine Learning Study in that it Helps Validate Statistical Models.**
- **Aircraft Brake Testing can Isolate the Contribution of Particular Factors Related to Degraded Braking such as Pavement Micro- and Macro-Texture.**