Turbulence Data Sharing Project

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Turbulence is

The leading cause of injuries to cabin crew and passengers in non-fatal accidents (FAA)

Costing airline industry **Millions** of dollars every year

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- Turbulence is a major safety concern for airlines
- It is one of the main causes of injuries in-flight and is the leading cause of injuries in non-fatal accidents according to FAA.
- Economic impact from potential in-flight diversions due to injuries, damaged aircraft interiors, excessive fuel burn and CO_2 emissions
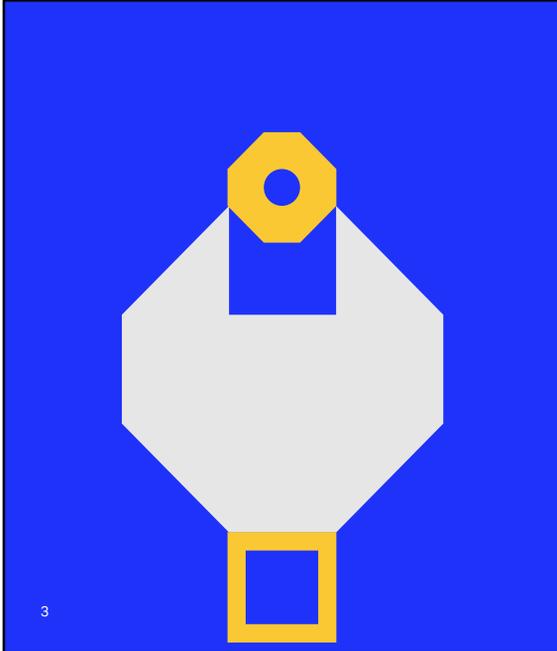
Existing tools for managing turbulence have limitations

- **Subjective** Pilot Reports
- Forecasts that may be **inaccurate** and **hours old**
- Weather radar is used for turbulence avoidance related to thunderstorms but **cannot detect clear air turbulence**

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- Current aviation meteorological tools are not enough
- Reports are subjective and can depend on aircraft size and pilot experience.
- Forecasts can be many hours old and potentially inaccurate.

Industry shift to data-driven turbulence management

Recent technical advancements now enable

aircraft to accurately calculate the turbulence state

of the atmosphere in flight

- Airlines use existing sensor data that is run through an algorithm to calculate turbulence values.

- These values are then compiled into a report that also includes a time stamp, aircraft position and altitude.

- Automated real-time turbulence reports are sent to the ground using standard aircraft communication systems.

Delta Air Lines' example of operational data use

Injuries avoided due to use of real-time turbulence data

Captain chose to rely on turbulence data and secure the cabin despite a smooth ride report from ATC

Aircraft subsequently flew through moderate turbulence

Several unsecured items were tossed about. However no injuries to passengers or cabin crew occurred

- Delta Air Lines: An example of how real-time turbulence data is used by pilots in-flight via a customized weather tool to help make better decisions, ultimately leading to a reduction in injuries.

Airlines requested IATA to be a global data consolidator

| Existing turbulence data is often not shared | Fragmented data pools limit benefits | Airlines need to see beyond their own data to mitigate turbulence | Importance of global data coverage |

- A number of airlines currently employ turbulence reporting products.
- They do not look at turbulence beyond their own airline.
- Leaves pilots and dispatchers with gaps in coverage making it more difficult to plan and fly around areas of turbulence.
- Airlines asked IATA to become a global data consolidator.
- With many airlines contributing their turbulence data to a shared database the industry will be able to see beyond their own data, viewing turbulence reports from other air carriers, which will ultimately improve turbulence mitigation.

IATA Turbulence Aware

A global platform for sharing automated turbulence reports in real time

Data is collected from airlines or third party ground servers in real-time

Data is consolidated, quality controlled and anonymized

Data processing throughout the platform is max 30 sec

Airlines use their own flight planning and in-flight tools to integrate the data

- IATA engaged Snowflake software, a UK-based company specializing in real-time aviation data fusion, to build the first global turbulence data sharing platform.

- The platform not only processes and hosts the turbulence data from various airlines but also makes it available for them to consume and integrate it in into their existing flight planning and inflight tools used by OCC personnel and pilots.

- The global data is also graphically displayed on the IATA Turbulence Aware web-based viewer.

Highly collaborative development

- Airlines currently actively participating in the project as part of the Advisory Council.

Platform implementation timeframe

Dec 2018: First operational version of the platform developed

Feb 2019 - Dec 2019: Operational trials

Jan 2020: Full launch

- The first operational version of the platform with all basic functionalities has been developed.

- 2019 will be focused on onboarding live data from various airlines into the platform and using the platform in real-time operations for test purposes.

- Full launch in January 2020.

Platform features
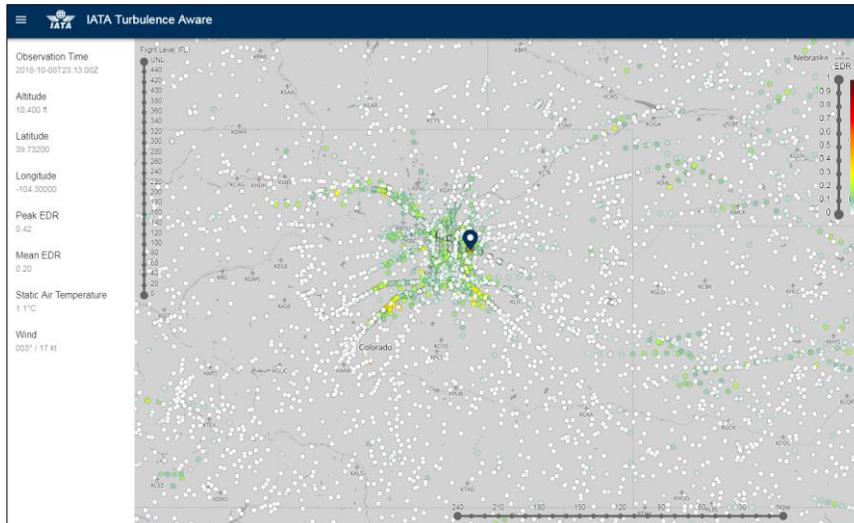
- This is a snapshot of the Turbulence Aware Viewer
- Color-coded turbulence reports are presented on a map
- White dots represent areas of no turbulence and colored dots represent different intensity of turbulence as per the scale on the right
- Flight Level filter on the left can be used to assess the intensity of turbulence at different flight levels
- Time slider at the bottom allows users to see turbulence reports between now and up to four hours prior
- The user can click on the dot and see a detailed report as shown on the left, including time, altitude, aircraft position, mean and peak turbulence values as well as wind and temperature data

Thank you.

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