Cockpit Weather
Existing Capabilities vs. Future "Must Haves"

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FPAW – Fall Meeting
Las Vegas, NV October 12, 2017

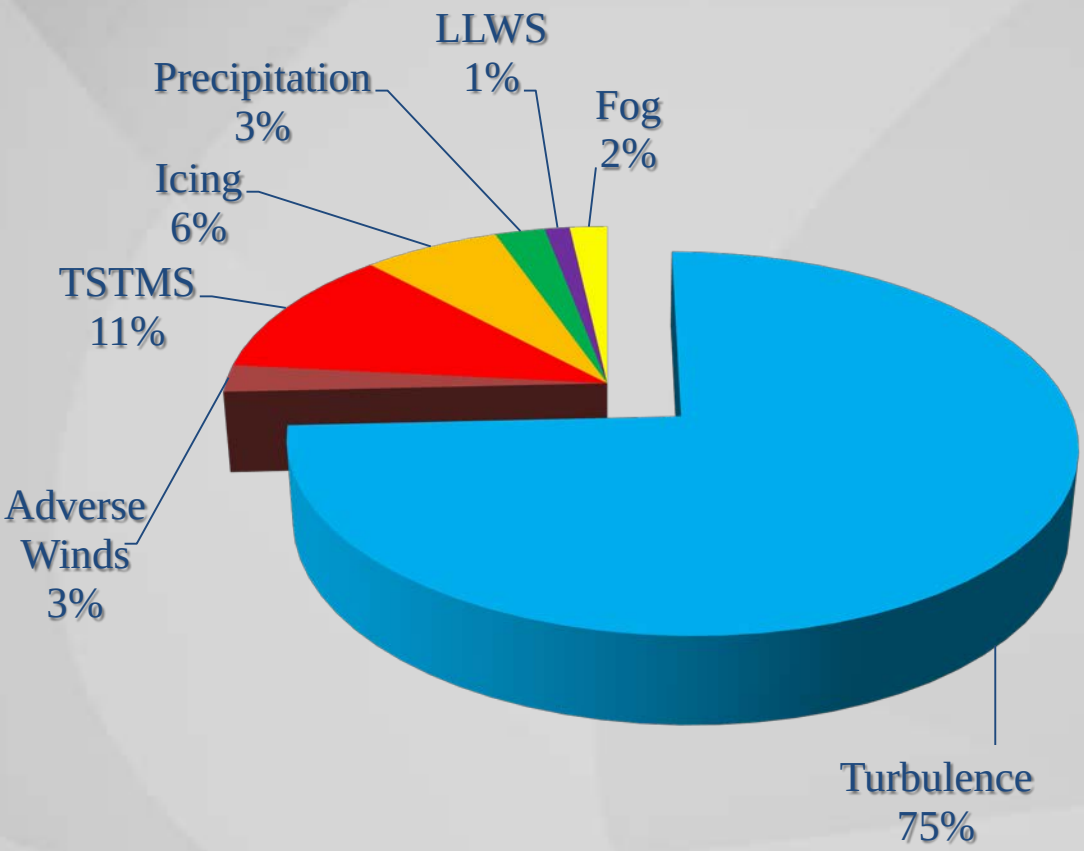
Weather Importance

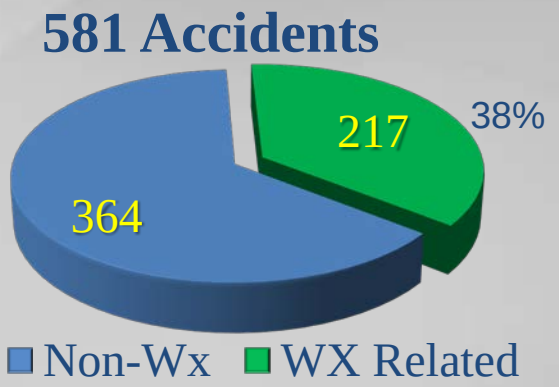
- Weather information is still one of the most important pieces of information pilots need for their daily operations – not just to meet the regulation but to maintain safety of flight

By Regulation

- §121.613 Dispatch or flight release under IFR or over the top
  - no person may dispatch or release an aircraft for operations under IFR or over-the-top, unless *appropriate weather reports or forecasts, or any combination thereof*, indicate that the weather conditions will be at or above the authorized minimums at the estimated time of arrival at the airport or airports to which dispatched or released.

Part 121 Air Carrier Weather Related Accidents 2000 - 2016





2016 Part 121 Air Carrier Accidents

- 29 Accidents
  - **Turbulence** **15**
  - Engine Failures/Fires 4
  - Gear Issues 3
  - Ground Collisions 2
  - Overruns – Wet/Contaminated RWY 2
  - Rapid Decompression 1
  - Landed Wrong Runway 1
  - Tail Strike – Adverse Winds 1

Turbulence Events

- 15 Turbulence events with 14 serious and 60 minor injuries officially reported in NTSB data base. Many other incidents with minor injuries not included in data base.

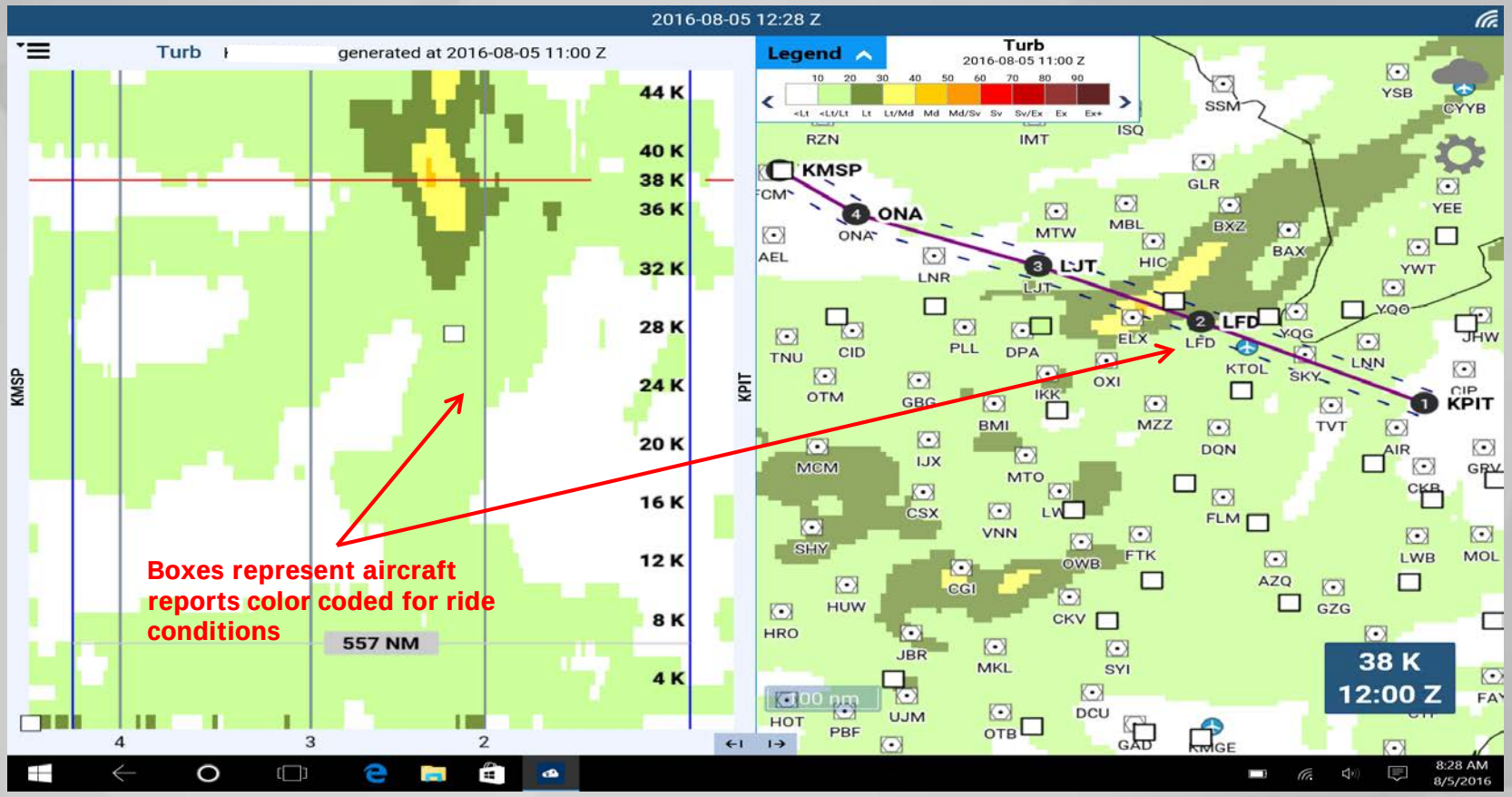
Gaps in Forecast Accuracy/Information

- There is still a significant gap in forecast accuracy for adverse weather conditions in the following areas
  - Turbulence
  - Icing
  - Volcanic Ash Detection
- These areas still pose a significant operational safety hazard to the flying community and further research needs to continue in order to improve the efficiency and safety of flight

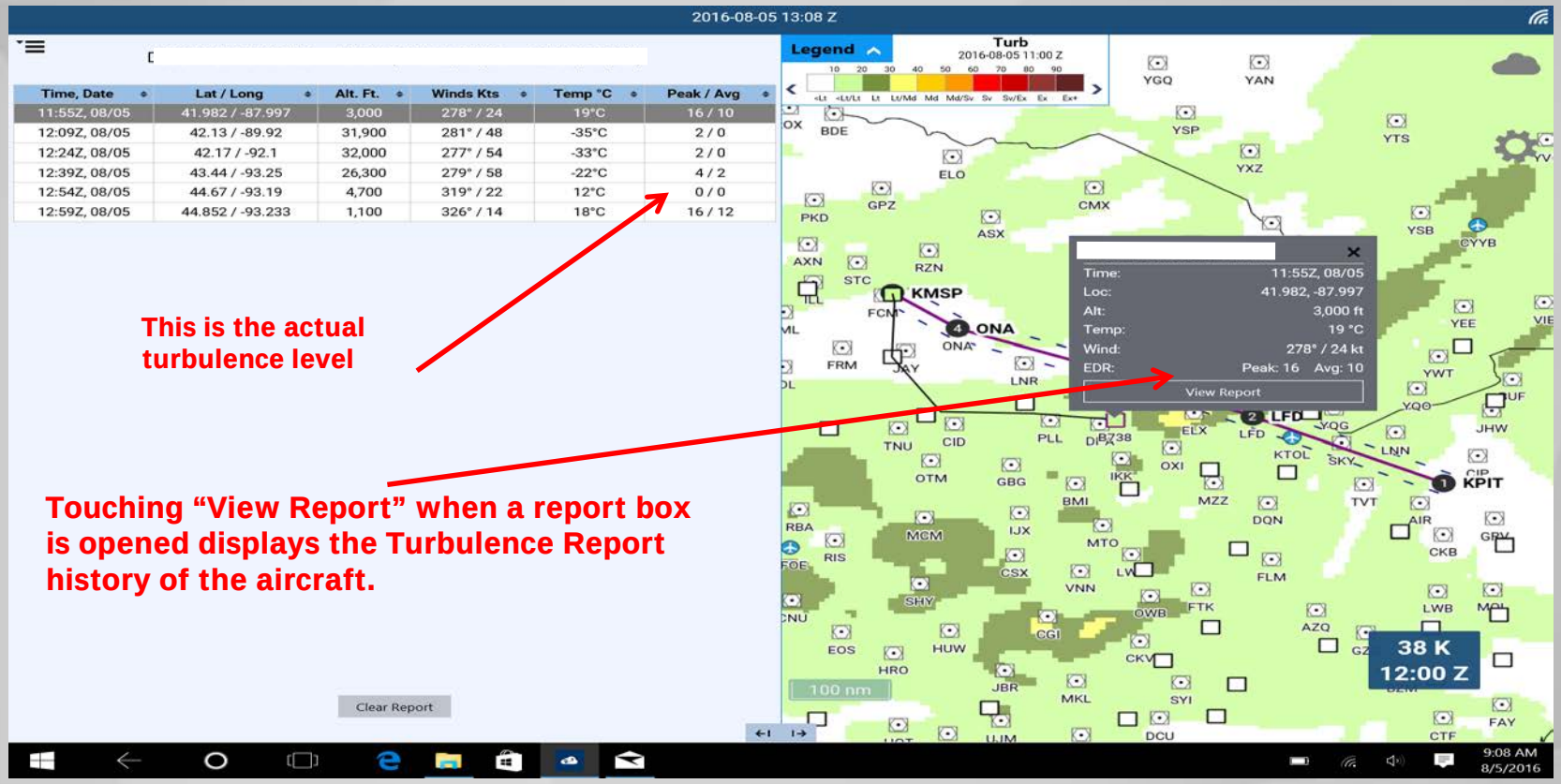
Turbulence Information

- Predicting the where, when and intensity of turbulence is notoriously difficult to do. But Delta has developed a new, industry-leading app that's helping pilots better spot and avoid it.
- Delta's Flight Weather Viewer app provides pilots with real-time graphics of turbulence observations and forecasts on the flight deck.

Tool in the Cockpit for Operational Decisions



Reports Validate Forecast and Facilitate Operational Decisions



Future Advancements - Turbulence

- GTG Nowcast
  - NEXRAD Turbulence Detection Algorithm combined with existing aircraft EDR reports fed back into the model makes it smarter
  - Delta Airlines helping to validate this product domestically
  - Need to move this technology into the Global GTG-N

Future Advancements Needed

- Over the next 5 to 10 years, technology advancements would help increase safety and efficiency relative to weather information in the cockpit

- ALPA would like to see advance detection and warning of High Altitude Ice Content (HAIC) provided to the flight crew

Validation is IMPORTANT

- With advancement, validation and verification of products is key to pilot and flight crew acceptance.
- In order for something new to be accepted within the operational environment of the carrier, long term studies and proven safety enhancements are needed in order for the company to adopt new safety information.

PIREP Information Critical

- Verification of upper-air forecasts as well as fill gaps in ground-station coverage
- NWS can only improve the system when it has accurate information—and reporting from pilots is key
- The more frequently pilots provide accurate inflight information, the more NWS can learn about unexpected conditions and, more importantly, refine its forecast models

PIREP Information

- ALPA strongly believes that more PIREP information and data sharing of PIREP information is critical to safety of flight
- Holding this information to gain a competitive advantage creates a negative environment in the long run and withholds critical safety information from those that need it most

Integrating Weather Information

- The more information and data that is integrated into avionics, the less workload it becomes for the flight crew
- Weather information combined with other flight information will minimize the workload and decision making for the crew and ultimately enhance safety and efficiency

Summary

- Weather information critical to aviation safety and helps compute aircraft performance for takeoff, landing and safe route selection
- Turbulence information helps find smooth air and reduce passenger/FA injuries.
- PIREP data helps pilots with detailed information for each phase of flight
- Integration helps decrease pilot workload and increase safety and efficiency


Together we are making a difference
THANK YOU
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