

The background is a light-colored map with various street names and landmarks. There are four stylized airplane icons: one in the top left, one in the top right, and one in the bottom right. The top left and right airplanes are blue with yellow and orange accents. The bottom right airplane is blue with a yellow tail.

# Improving Cabin Safety via Turbulence Planning and Communication

**Thursday, November 3, 2016 | 9:30am – 10:00am(TBD)**

**PRESENTED BY:**

**Winston S. Carter, CAM - Flight Ops Dispatcher, Gulfstream Aerospace Corp.**

**Judith Reif - Flight Attendant, JR Flight Services, Inc.**



**NBAA**



**BUSINESS AVIATION  
CONVENTION & EXHIBITION**  
NOVEMBER 1-3, 2016  
ORLANDO, FL

# Problem Statement

- Turbulence remains the number one culprit of injuries for flight attendants and passengers
- Advancements in turbulence forecasting, data uplink/downlink, EFB applications, and onboard radar detection have led to improvements
- Improved communication of threats and information to the cabin has yet to occur: when, how severe, how long?



## Turbulence Injuries (Part 121)

| Year | PAX | Crew | Total |
|------|-----|------|-------|
| 2006 | 4   | 8    | 12    |
| 2007 | 5   | 20   | 25    |
| 2008 | 18  | 16   | 34    |
| 2009 | 80  | 26   | 107   |
| 2010 | 62  | 27   | 89    |
| 2011 | 6   | 23   | 29    |
| 2012 | 9   | 21   | 30    |
| 2013 | 9   | 4    | 13    |
| 2014 | 22  | 9    | 31    |
| 2015 | 7   | 14   | 21    |

# General Aviation (part 91, 135)

- Turbulence incident reporting not published by FAA and NTSB for continuous safety improvement (only Part 121)
- Incident reports concerning corporate aircraft turbulence events are usually published from overseas aviation agencies (EASA, Spanish Civil Aviation and Incident Investigation Commission, Civil Aviation Authority of China)
- Most operators prefer avoidance of the risk of turbulence in flight planning  
i.e. willingness to burn fuel for comfort vs. airlines with flight efficiency is the baseline for flight plans
- Flight attendants not required on any size aircraft with 19 seats or less (per FAA)

# Current State

## Dispatch perspective

- 121.601 states how the aircraft dispatcher must provide available information pertaining to turbulence during planning and flight following.
  - 135 and 91 do not have such mandates. Why shouldn't business aviation maintain this standard, regardless of regulation?
- The word “turbulence” is rarely mentioned in corporate aviation audit manuals/protocols
- Dispatchers and schedulers are in a position to serve as an excellent source of information as the “hub” of most flight departments.

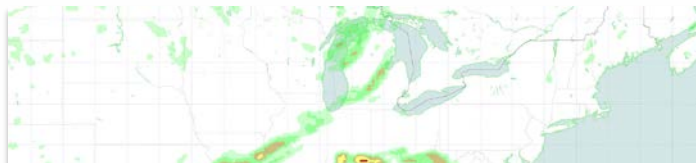
# Current State

## Crew perspective

- Part 91 and Part 135 - flight attendants not required nor recognized by the FAA. (FAR 91.533)
- Passengers have a tendency to ignore seatbelt signs
  - “It can’t happen to me” mentality
  - Most annoyed by multiple seatbelt chimes enroute.
- Even in Part 121, FA’s are not always included in weather briefings.
- Emphasize FA personal safety - Secure cabin and galley items to minimize injury risk - turbulence will win

# Advancements for Enroute

...not yet leveraged in the cabin



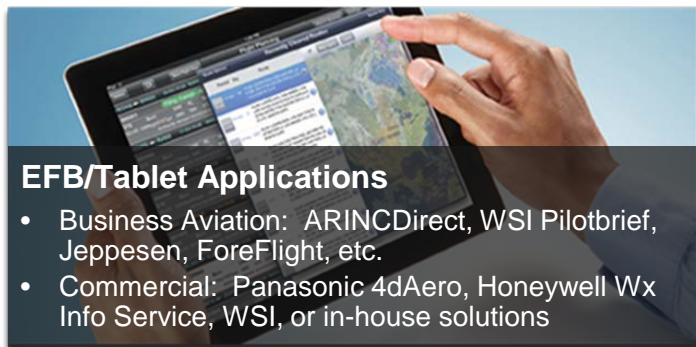
## Turbulence Forecast Advancements

- EDR Turbulence guidance
- Public: NCAR's *Graphical Turbulence Guidance*
- Private: WSI, Schneider Elec, Meteostar



## Downlink/Uplink Information

- Aircraft observation assimilation into models and monitoring tools
- Push notifications to cockpit



## EFB/Tablet Applications

- Business Aviation: ARINCdirect, WSI Pilotbrief, Jeppesen, ForeFlight, etc.
- Commercial: Panasonic 4dAero, Honeywell Wx Info Service, WSI, or in-house solutions



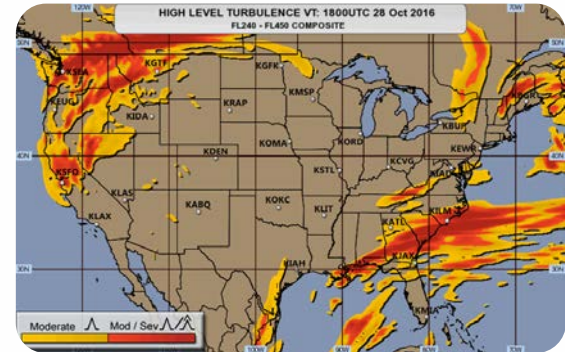
## Cabin communication

- Pilot audio notification (tone, seatbelt sign, phone)

# Proposed Changes

## Improved pre-flight briefings with crew, pax

- Inclusion of entire crew in pre-flight briefings
  - Pre-Departure Risk Assessment with all crew members
  - Share relevant information with pax
- Utilize the talent and tools already in place. Dispatchers and schedulers have varying backgrounds.



### Flight Briefing Example:

#### IMPORTANT NOTES

WEATHER ALERT FOR . . . . . A LOW LEVEL VOLCANIC ERUPTION IS TAKING PLACE FOR MT. YASUR IN VANUATU. NO IMPACT EXPECTED. MODERATE TURBULENCE IS EXPECTED WEST AND SOUTHWEST OF CALIFORNIA DUE TO A STRONG JET AND TROUGH MOVING IN.

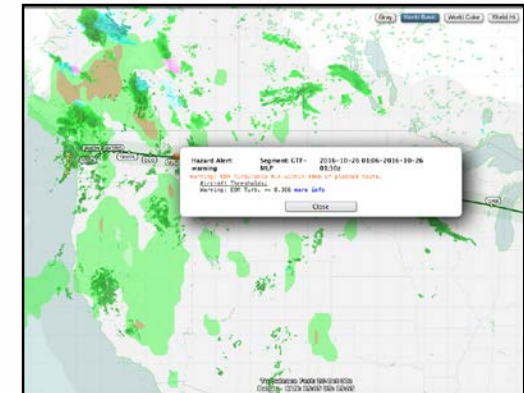
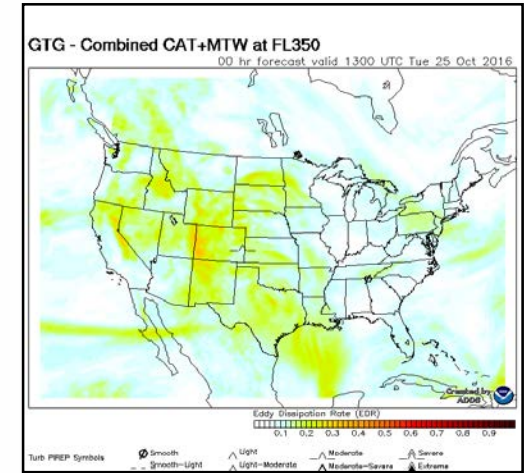
PLEASE NOTE RUNWAY CLOSURES AT YSSY, YBBN, PHTO & KLAX. ALSO SEE CLOSURE TIMES AT KOAK. SEE NOTAMS FOR DETAILS.



# Proposed Changes

## Education and Training

- Improve crew performance thru better crew communication - CRM
- Develop training program to address turbulence - establish best practices in SMS and SOP's - risk assessment form
- Training of crew members, schedulers, and dispatchers for utilization of graphical weather resources and situational awareness tools
  - Public resources: e.g. GTG over US airspace
  - Private subscriptions: weather apps, flight planning services (w/ weather integrated), etc.

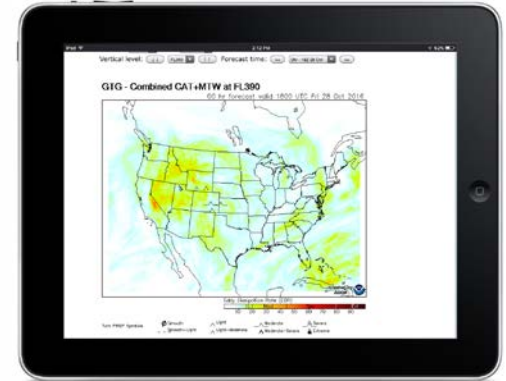




# Proposed Changes

## Encourage inflight tool usage

- Flight attendant access to enroute graphical weather applications for situational awareness
  - Short Legs (<2hrs): data downloaded pre-flight relevant, useful
  - Longer legs (>2hrs): Ability to download recent data would be ideal
- Push notifications received by both cockpit and cabin, or at a minimum share information with cabin
- Training for utilization of new tools



# Proposed Changes

## Expanded NBAA Guidelines

- Address in NBAA Management Guide and SMS programs.
- Work closely with other NBAA Committee's promoting better communication of weather risks.

# Questions and Discussion?



# NBAA BACE

**BUSINESS AVIATION  
CONVENTION & EXHIBITION**

**NOVEMBER 1-3, 2016  
ORLANDO, FL**

