Progress in Turbulence Information

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Friends/Partners in Aviation Weather Forum
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Operational NWS Turbulence Products

- **SIGMETs**
  - Issued by AWC, AAWU, and WFO Honolulu for Severe Turbulence or Convection over domestic and oceanic airspace

- **AIRMETs**
  - Issued by AWC, AAWU, and WFO Honolulu for Moderate Turbulence over domestic airspace

- **MIS/CWA**
  - Issued by CWSUs and specialized for needs of the ARTCC

- **Significant Weather Forecasts**
  - 100-FL630: 24 hour forecast issued by AWC and WAFC London for moderate or severe turbulence for entire globe
  - Low-Level: Issued by AWC and AAWU for moderate or greater turbulence

- **Graphical Turbulence Guidance**
  - Supplementary and restricted automated product issued by AWC every hour for turbulence intensity between FL200-FL450
GFA/G-AIRMET Implementation

• GFA Work Group
  • Government/Industry group est. by FPAW

• G-AIRMET
  • Nov 2006: Standardize Text AIRMET
  • Feb 2007: Experimental G-AIRMET
  • Oct 2007: G-AIRMET Supplementary/Unrestricted
  • ~Oct 2008: G-AIRMET Primary

• GFA
  • 2009-2011

• More GFA discussion during Cross-Cutting Issues this afternoon
Turbulent Weather in Graphical Forecast for Aviation (GFA)

- **Graphical AIRMET** (Includes all criteria in AIRMET Tango)
  - Moderate Turbulence
    - *Bases and Tops*
  - Low-Level Wind Shear
  - Surface Winds in excess of 30 knots
- **Full GFA**
  - Mountain Waves
  - Surface Winds in excess of 20 knots
G-AIRMET Example

More Demos and Information at http://aviationweather.gov/testbed/g-airmet/

0000-1200 UTC All Turbulence
• 20500 PIREPs submitted in last year via AWC Web PIREP submission form

• 77% (15800) of those Turbulence reports

• Organizations wishing to participate should contact AWC

https://aviationweather.gov/exp/pirep_submit

Major Contributors
Alaska Airlines
Southwest Airlines
Delta Airline
Continental Airlines
Turbulence in Significant Meteorological Weather Forecasts

- ICAO Annex 3 requirement
- 24 Hour Global Forecast
- Includes Moderate and Severe Turbulence
- July 2006 became a **DIGITAL** product
  - Distributed in a digital format - BUFR
  - Objects which are being integrated in user systems
WAFS Global Turbulence Grids

- Goal is to replace current WAFS SIGWX-Medium (FL100-450) forecasts charts by 2010.
- Global gridded Icing, Turbulence, and Convective Clouds by US and UK
- US development by NOAA Environmental Modeling Center (EMC)
  - Funded by FAA Requirements and Policy
  - Plan to develop and test by Feb 2008
  - UK’s being evaluated by IATA and IFALPA
- 2008-09: ICAO & WMO plan to conduct user training on the use of gridded WAFS products.
Short-Range Ensemble Forecasts (SREF)

- Experimentally produced by NOAA Environmental Modeling Center (EMC)
- Combination of multiple models
  - Different initial conditions or model configurations/parameterizations.
- Level of uncertainty, the most likely forecast outcomes, and probabilities of those outcomes
- Turbulence probabilities
  - Light-Moderate, Moderate, & Severe
  - Ellrod Index
SREF Probability
Moderate Turbulence

Prob of MDT Turbulence between FL330 and FL300. At 51H, FCT