Airborne In Situ Weather Observations
Government Perspective

Presented to: Friends and Partners of Aviation Weather

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Airborne In Situ Weather Observations
Government Perspective

• Current Status
  – MDCRS Contract
  – Eddy Dissipation Rate (EDR)
  – Graphical Turbulence Guidance (GTG)
  – Future Efforts

• Optimization
  – Right-sizing Program – Airborne Obs Component
  – Need for interagency/industry-level agreements
Airborne In Situ Weather Observations
MDCRS Contract Update

• Current contract with ARINC expires Mar 31, 2011.
• Market survey currently out on FAA Business Opportunities website
  – https://faaco.faa.gov/
Airborne In Situ Weather Observations
Eddy Dissipation Rate (EDR)

• Current Deployments
  – DAL ~80 737NGs
  – UAL ~100 757s
  – SWA 10 737s (FY10)

• FY11
  – Continue SWA deployments
  – Begin deployment DAL and UAL 767s
    • Transoceanic coverage
Average 24 hour EDR coverage

UAL ~100 a/c

DAL ~80 a/c

SWA 10 a/c
Airborne In Situ Weather Observations
GTG2 Implementation

• GTG2 incorporates EDR observations
• GTG2 implemented operationally at AWC 1Qtr 2010
Projected GTG releases – next 7 years

<table>
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<tr>
<th>Version</th>
<th>Capabilities</th>
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<tr>
<td>GTG1Upper levels</td>
<td>RUC20</td>
<td>3/2003*</td>
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<tr>
<td>GTG2Improved GTG1</td>
<td>+Mid levels</td>
<td>2/11/2010*</td>
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<td></td>
<td>+Uses UAL in situ</td>
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<td>GTG2.5</td>
<td>13 km WRF RR</td>
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<td>+VWA insitu</td>
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<td>GTG31</td>
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<td>mid+upper levels, 0-15 min</td>
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<td>GTG4Improved GTG3</td>
<td>Ensembles/Probabilistic forecasts</td>
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<td>all altitudes, full WRFRR domain</td>
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<td>GTG5</td>
<td>Improved GTG4</td>
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<td>GTG6Improved GTG5</td>
<td>&lt; FL650</td>
<td>FY19</td>
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Seg 1 versions

NextGen IOC versions

Future Efforts

• Future EDR Deployments
  – “When is enough, enough?”
  – NAS cost-benefit needed for possible future government buy-ins
  – DAL EDR Proof of Concept Demo
    • Attempting to document benefits to NAS capacity and flight operations
    • Data collect on-going, thru mid-January 2011
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Future Efforts

• MCR on contract for EDR NAS cost-benefits study
  – Purpose:
    • To determine delays due to Clear Air and Convectively Induced Turbulence
    • To quantify the amount of avoidable turbulence delays that EDR could be expected to mitigate
  – Preliminary results available in FY11
Airborne In Situ Weather Observations Optimization

- The selection of specific aircraft to obtain the data required to meet the government’s forecasting needs while reducing redundant or unnecessary observations that increase communications and processing costs.

**Spatial Coverage**

**Temporal Coverage**

ACARS - Mean Obs by Hour
May 13, 2001 to June 2, 2001 (Conus)

- Number of Observations vs Hour (UTC)
Airborne In Situ Weather Observations Optimization

- FAA Right-sizing Program: Airborne Obs Component
  - Baseline of current airborne sensor capabilities near complete
  - Concept of Operations in development
  - Requirements analysis underway
  - Gap identification (Super Density Terminal Ops) FY11
  - Gap Identification (En Route) FY11-12
  - Mitigation strategy development/demos FY12
Airborne In Situ Weather Observations Optimization

• Cooperative strategy development
  – FY11 – Governmental interagency agreements
  – FY12 – Government/Industry interagency agreements
    • Cost responsibilities?
    • Data access?
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Summary

• FY10:
  – SWA EDR deployments begun
  – GTG2 implemented operationally
  – DAL EDR Demo On-going

• FY11:
  – Begin DAL/UAL 767 EDR deployments
  – Optimization – Right-sizing Activities
  – Conclude DAL EDR Demo and Cost Benefits Analysis

• Future (FY11/12 →):
  – Optimization
  – Cost and data sharing policy/agreements development
• Back Up Slides
Airborne In Situ Weather Observations

Terminology

- **AM DAR** – Aircraft Meteorological DAta and Relay: A WMO-sanctioned international program of nations with air carriers that provide automated weather observations.


- **ACARS** - Aircraft Communications, Addressing, and Reporting System: The name of a datalink service provided by Aeronautical Radio, Inc. (ARINC) that sends information between aircraft and ground stations.

- **TAMDAR** - Tropospheric Airborne Meteorological DAta Reporting: “AirDat's network of patented airborne sensors…which provide a continuous stream of real time observations….“. (http://www.airdat.com/./index.php)