

WORLD METEOROLOGICAL ORGANIZATION

ET-AIR-3 and AMDAR Panel-14/Doc. 3.3.(2)

(13.X.2011)

**JOINT MEETING:
CBS EXPERT TEAM ON AIRCRAFT BASED
OBSERVATIONS
(Third Session)
AND
AMDAR PANEL
(Fourteenth Session)**

ITEM: 3.3

Original: ENGLISH ONLY

(QUEBEC CITY, CANADA, 2-4 NOVEMBER 2011)

AMDAR PROGRAMME STATUS

Report on Activities by the Training and Outreach Sub-Group

(Submitted by Carl E. Weiss, Convenor, Training and Outreach Sub-Group Convener)

SUMMARY AND PURPOSE OF DOCUMENT

To provide the AMDAR Panel with a report on the activities of the Training and Outreach Sub-Group since the last meeting

ACTION PROPOSED

1. The Panel is invited to note the information contained in the document.
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2011 AMDAR OUTREACH PROGRESS / ACTIVITY REPORT

Current Status:

1. The U.S. continues to promote AMDAR at various events and venues.
2. The U.S. also continues to seek new opportunities to promote AMDAR.

Development and other Activities:

3. Bryce Ford (SpectraSensors, Inc.) displayed a WVSS-II unit and distributed printed material at the NOAA Technology Summit Nov. 4, 2010 in Silver Spring, MD.
4. WVSS-II poster (below) and looped slide show was presented by Bryce Ford at the Nov. 9-10, 2010 Air Traffic and Meteorology conference, Toulouse, France. The conference was hosted by the Académie de l'Air et de l'Espace.
5. Bryce Ford wrote an article on WVSS-II for thAMDAR Workshop in Mexico City - Southwest Airlines Autumn 2010 Royal Meteorological Society Newsletter.
6. Additionally, SpectraSensors, Inc., or its subcontractor The Drake Group, promoted WVSS-II at the following events:
 - a. 2010 Unmanned Aerial Systems (UAS) Technical Analysis and Applications Center (TAAC) Conference, December 7-9, 2010, Santa Ana Pueblo, NM
 - b. 2011 American Meteorological Society (AMS) Annual Meeting, January 23-27, 2011, Seattle, WA
 - c. 2011 Association for Unmanned Vehicle Systems International (AUVSI) Unmanned Systems North America Conference, August 16-19, 2011, Washington, D.C.
 - d. 2011 National Business Aircraft Association (NBAA) Annual Meeting, Oct 10-14, 2011 Las Vegas, NV
7. On Oct. 21, Randy Baker (UPS) gave a 5-minute presentation on WVSS-II at the Friends and Partners of Aviation Weather (FPAW) meeting in Atlanta, GA.
8. Also at the FPAW meeting, Rick Curtis (Southwest Airlines) mentioned during his talk Southwest Airline's participation in the WVSS-II program.
9. At the 2011 Experimental Aircraft Association's (EAA) AirVenture (July 24-31), the National Weather Service (NWS) again promoted AMDAR activities at its exhibit. An AMDAR poster was displayed at the NWS booth along with a WVSS-II unit and TAMDAR poster.
 - a. Rich Mamrosh (NWS Weather Forecast Office in Green Bay, WI) and I spoke with numerous visitors about the AMDAR program and how the data play an important role both in NWP and forecast/watch/warning issuance.
 - b. We talked about the missing element in the AMDAR data being a water vapor sensing capability and how NWS is addressing this through the WVSS-II program.
 - c. Response from the General Aviation visitors with whom we spoke was unanimous; AMDAR is a valuable program and should be continued/expanded.
 - d. Rich Mamrosh gave two 30-minute presentations on aircraft observations entitled "Weather Data From Commercial Aircraft".
 - e. More information about the NWS exhibit at AirVenture can be found at http://www.airventure.org/attractions/federal_pavilion.html.

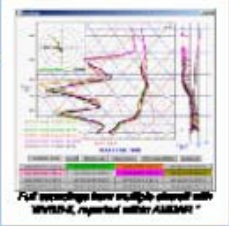
10. At the Air Transport Association (ATA) Meteorology Work Group Meeting on June 16, an entire session was devoted to AMDAR/MDCRS. Presentations given were:
 - a. Tammy Farrar, FAA
 - i. Current MDCRS contract extends to Sept.30, 2011
 - ii. Contract negotiations in progress with ARINC
 - iii. Alaska Airlines now participating in MDCRS
 - iv. Delta completed EDR proof on concept Jan. 2011
 - v. Results showed improved decision-making in fuel, safety, and NAS capacity
 - vi. Results will be presented at the AMS/ARAM conference in 2011
 - vii. Delta graphical turbulence uplink demo tentatively planned to start in early FY 2012
 - viii. GTG 2.5 planned implementation 10/11 incorporates rapid refresh model and Delta EDR data
 - ix. GTG 3 planned implementation 2013 will include mountain wave forecasts for surface- FL 450 valid 1-8 hours
 - b. Dave Helms, NWS
 - i. Future AMDAR Plans
 - ii. Certify the water vapor (WVSS) Sensor on B 737-700 and -800 and AirBus A319
 - iii. Continue testing with WVSS and radiosondes
 - iv. Enhance the monitoring and flagging of suspect WVSS data
 - v. Promote regional AMDAR partnerships (Mexico...)
 - vi. Operational deployment of EDR turbulence reporting
 - vii. Expand EDR internationally
 - viii. Enhance WVSS sensitivity from 50 ppmv to 1 ppmv through additional research
 - ix. Prototype US optimization capability with Southwest Airlines
 - c. Carl Weiss, NWS
 - i. AMDAR Panel will conduct an AMDAR workshop in Mexico City Nov. 8-10, 2011
 1. U.S. supporting workshop by:
 - a. Adding Alaska Airways to U.S. MDCRS program
 - b. Supplying AMDAR data to Mexico forecasters
 - c. Funding travel expenses for U.S. presenters and regional observers
 - d. Funding AMDAR start-up costs
 2. Mexican AMDAR will benefit the U.S. by providing a new source of upper air observations for monsoon and tropical weather analysis and forecasting.

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Water Vapor Sensing System, WVSS-II, for use in the WMO Aircraft Meteorological Data Relay (AMDAR) System

- **AMDAR Plays a Key Role in Aviation Meteorological Forecasting** with more than 3000 Aircraft on a Global Scale providing more than 220,000 Observations Daily reporting Upper Air Temperatures and Winds, but lacking Water Vapor data
- **WVSS-II provides the Technology for AMDAR to Include High Quality Water Vapor Profile Observations with High Stability and Reliability**
- **Independent Validation of WVSS-II Performance in Multiple Climate Chamber Tests, Intercomparisons, and Flight Operations**
- **High Value to Improving Forecasts of Fog, Convective Storms, Winter Storms, Icing Conditions, and Assimilation into NWP**
- **Low Impact to Airline Operations - Low Weight, Low Drag, Low Size, Low Power, and Low Maintenance**
- **In Operation today in the USA and Europe with 34 WVSS-II units in use, with plans to increase to over 100 units in 2011**
- **Installed currently on Aircraft at UPS, Southwest Airlines, and in Europe**
- **Worldwide National Meteorological Services are Currently Evaluating WVSS-II for Implementation with Partner Airlines**



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Future Plans:

11. As in 2011, NWS and the U.S. AMDAR program plan to continue promoting AMDAR, including WVSS-II, at the Experimental Aircraft Association (EAA) AirVenture and the National Business Aviation Association (NBAA) Convention and other appropriate events. Also, we hope take advantage of new outreach opportunities that present themselves during the upcoming year.

2011 AMDAR TRAINING PROGRESS / ACTIVITY REPORT

Current Status:

1. NTSB uses AMDAR data frequently in the meteorological factors sections of aircraft accident investigations. In a recent accident report the NTSB stated "Aviation safety in Alaska is highly dependent upon the quality of weather forecast products produced and disseminated by the NWS. U.S. government weather forecast model output and NWS weather advisory products can benefit substantially from improved meteorological data collected not only at the surface of the earth but also from airborne aircraft."
2. Continued to include forecast applications of AMDAR into COMET training modules. In the past year, AMDAR applications have been included in the HYSPLIT and Volcanic Ash modules. AMDAR is mentioned as a valuable tool for predicting the transport of hazardous airborne chemicals in the HYSPLIT model. Forecasters are also encouraged to look at recent AMDAR data when informed of a volcanic ash release.

Development and other Activities:

3. Included in the NWS volcanic ash aviation training course, in the Impacts to Aviation, Climate, Marine Operations and Society module, is a GSD web site animation of AMDAR activity for the North Atlantic and Europe during the eruption of Eyjafjallajökull. The animation, in 3-hour intervals from April 14, 2010 at 00:00UTC to April 21, 2010 at 21:00UTC, shows the reduction in air traffic across the area as the ash cloud spread toward the south and east.
4. Jonathan Blaes and Barrett presented "Examination of a Winter Storm using a Micro Rain Radar and AMDAR Aircraft Soundings" at the National Weather Association meeting in October, 2010. <http://www.erh.noaa.gov/rah/science/presentation.2010.nwa.smith.blaes.ppt>
5. After conducting impact studies of the Water Vapor Sensing System (WVSS) observations (e.g., ACARS humidity) on model analysis, NCEP will include WVSS in the operational data assimilation system, Gridscale Statistical Interpolation (GSI). GSI creates the analysis for the North American Model (NAM) starting this Fall.

Future Plans:

6. Rich Mamrosh is working with the organizers of Think Global Flight, a non profit organization that works to encourage interest in math, science and engineering among high school students. High School students will plan, organize and carry out an around the world flight in 2013. It is hoped that AMDAR data will be used in the flight planning and briefing (pending approval by the airlines). <http://thinkglobalflight.com/>
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