WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

How will ABO change over next 10 years?
Dean Lockett, WMO

WMO OMM

World Meteorological Organization
Organisation météorologique mondiale

Content

Expectation for next 10 years (+):

- Requirements for ABO
- ABO development generally
- Developments in AMDAR
- Humidity, icing & other variables
- Use of data by aviation
- UAVs
- Contributions to Big Data

Requirements to meet over period

Requirements

- Increased met. (HR NWP) requirements for HR data will drive ABO expansion
- Fill gaps: data-sparse areas, tropics and SH

Action/Implication/Comment

- ABO Programs need to respond to this requirement

General trends in ABO

Expectation

- Requirement for HR ABO initially **met** in some areas though greater availability of ADS-C, Mode S and ADS-B

Action/Implication/Comment

- Faster take up over Europe and USA – slower in other areas
- Much wider after 10 years
- Harmonization over Europe may allow AMDAR data costs to be redirected into other ABO
- Scope to expand ADS-C working with ATM/ANSP
- Push for mandatory or wider met. reporting with ADS-B
- Better QC required
- Develop improved data sharing techniques, formats

General trends in ABO

Expectations

- Access to ABO data will be easier due to less restrictive access to onboard avionics data sources – e.g. Electronic Flight Bag (EFB) coupled with satellite communications

Action/Implication/Comment

- AMDAR Programs to work with IATA (WICAP), Airlines, Standards Bodies and Avionics developers to ensure ABO requirements are available/met
- Will lead to cheaper solutions and costs for ABO programs

General trends in ABO

Expectation

- Wider availability of solutions for ABO (including turbulence) provision from factory floor.

Action/Implication/Comment

- WMO and IATA to push for this with manufacturers and airline partners
- Require clearer and unified approach to Aircraft Reports applications and functions

General trends in AMDAR

Expectation

- 2 to 3 x expansion of AMDAR program through development of WICAP

Action/Implication/Comment

- Early development heavily dependent on successful BC with IATA/airlines
- Success of WMO and RAs collaborating and obtaining resources
- Possibly driven by grant money in data-sparse, econ. challenged areas.
- Driven by success of TurbAware.
- Helped by improved/efficient solutions & cheaper comms
- Require harmonisation with other ABO sources – Mode S, ADS-C, etc

General trends in AMDAR

Expectations

- Increased reporting of humidity via AMDAR***

Action/Implication/Comment

*** Heavily dependent on:

- BC developed between WMO, IATA, Airlines & Manufacturers
- Factory floor integration
- Better demonstration of impact on NWP and better promotion of impact

General trends in ABO

Expectation

- Wider availability and sharing of TAMDAR and AFIRS data

Action/Implication/Comment

- High degree of certainty with the USA taking the lead in securing the data intially
- WMO Members and Data Users must assist in meeting costs
- TAMDAR increases availability of ABO/humidity

General trends in ABO

Expectation

- Increased reporting of atmospheric parameters – water vapour, ozone, ash, cloud, onboard LIDAR/radar, aerosols/greenhouse gases
- Increased reporting of icing/ice acretion

Action/Implication/Comment

- Driven by health and safety of crew and environmental and societal benefits
- Requires push from within the aviation industry
- Require development of “plug and play” type solutions
- Use for calibration of satellite monitoring systems (increased)
- Possibly Data from radio occulting, data from onboard radar systems

General trends in ABO

Expectation

- Wider use in ATM
- Possible direct use in the cockpit

Action/Implication/Comment

- Will be required to support the Next Gen ANS – SWIM (System Wide Information Management)
- Driven by required increase in efficient use of airspace
- Still only early stages within next 10 years?
- Data ownership/sharing issues must be resolved
- Merge obs. data with forecast products

General trends in ABO

Expectation

- Metadata standards to become more important for QC of large volume and HF data sources

Action/Implication/Comment

- WMO needs to accelerate efforts to develop a metadata repository for ABO
- Expect OSCAR/ABO to be available within 2 years
- Requires airline cooperation – e.g. WICAP data policy

Turbulence Monitoring & Prediction

Expectation

- Increase in turbulence/EDR measurement
- Improved predictive skill of models

Action/Implication/Comment

- Initially driven by IATA through TurbulenceAware
- Better standardised, normalised and harmonised across alternative algorithms
- Better integrated into and via the GANP
- Requires efforts to ensure wide data availability and sharing

UAVs

Expectation

- More ABO data from a greater variety of sources, particularly more so from low-flying, short-range autonomous vehicles.
- Initial UAV operational use will be in lower boundary layer (drones, small UAV) and upper trop. /lower strat. (High alt. gliders + drop sondes)

Action/Implication/Comment

- UAVs introduction and breadth of use heavily dependent on regulatory restrictions to airspace
- Initial possibities for large data via «Line of Sight» introduction by NMHSs and Volunteers
- WMO and Members need to harness crowd sourcing – paid and voluntary
- WMO and Members to use operationally, need to work with regulators
- WMO held workshop in July 2020 – now working on white paper on future of UAVs in operations
- Integration with shipping, moored platforms possible
- Later – autonomous, safety-intelligent (collision avoidance), UAV/drone swarms

General trends in ABO (> 10 years)

Expectation

- All aircraft to stream operational (and met. Data) data to the developing SWIM system under Global Air Naviation Plan.

Action/Implication/Comment

- ADS data is the precursor to this and is with us now
- Large scale not likely within 10 years?
- At that point, when data is abundant, NMHSs need only worry about accessing these data – NO AMDAR

General trends in ABO > 10 years

Expectation

- «Big Data» and «Internet of Things» to be a source of ABO Data – e.g. seat belt sign on registers turbulence event,

Action/Implication/Comment

- WMO, Members and Data Users need to prepare the way for accessing, handling and using such data.
- Depends on communications connectivity – which is likely to come fully to aircraft via sat. Comms.

WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

Thank you
Merci

WMO OMM

World Meteorological Organization
Organisation météorologique mondiale