



THE AANDD OPERATIONALIZATION WORKSHOP

Module 6 – Minimum Reporting Areas - MET

Goama ILBOUDO
WACAF Regional Officer MET

Chinga Mazhetese
ESAF Regional Officer MET/ENV



Content

1. Introduction
2. Minimum Reporting Areas in the Area of responsibility of Aerodrome MET Offices (AMOs)
3. Minimum Reporting Areas in the Area of responsibility of Meteorological Watch Offices (MWOs)
4. Minimum Reporting Areas at the Global /Regional level
5. Next Steps



Introduction

Foundation of any robust air navigation system

- The Basic Building Block (BBB) framework outlines the foundation of any robust air navigation system
- The **foundation** of any robust air navigation system :
 - Consist of essential services (ES) to be provided for international civil aviation in accordance with ICAO Standards and Recommended Practices
- These essential services are defined in the areas of AOP, ATM, SAR, MET and AIM. In addition, BBBs framework identifies the end users of these services as well as as well as CNS Infrastructure to provide them.

Essential services (ES) in MET

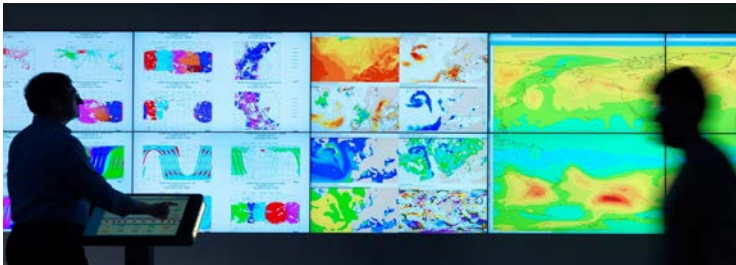
- **The essential services in MET :**
 - consist of a set of MET services recognized by ICAO Member States as necessary to contribute for international civil aviation to develop in a safe and orderly manner, and as such, shall be provided in accordance with ICAO Standards.
- Any deviation from ICAO SARPs and regional ANP provisions regarding the provision of essential services results in a deficiency that should be reported.

Minimum reporting area

- **A minimum reporting area in MET encompasses :**
 - The MET essential services
 - The related **ICAO SARPs** and Regional ANP requirements
 - The **resulting deficiency** if the ES is not provided in compliance with the SARPs
 - The **impact of deficiency** (if happen)
 - **First reported Date**
 - **Mitigation measures**
 - **Target dates**

①

MET Minimum Reporting Areas in the Area of Responsibility (AoR) of the Aerodrome Meteorological Offices (AMOs)





Flight briefing services

MET Related regulations and Procedures

- SARPs & Requirements
 - ICAO Annex 3: Chap. :9; App.: 8
- References /Guidance Material
 - Doc 8896, WM N°1100, Doc 10003

Potential Deficiency and Impacts if not implemented

Lack of providing Aeronautical users with the latest available information on existing and/or expected meteorological conditions along the route to be flown, at the aerodrome of intended landing, alternate aerodromes and other aerodromes as relevant, **may lead to safety risks for aircraft undertaking the flight.**



Met. Observations and Report Services

MET Related regulations and Procedures

- SARPs & Requirements
 - ICAO Annex 3: Chap. :3,4; App.:2,3
 - AFI eANP Volume II Part V: Table II-2, Table MET II-3 ; §2.2, §2.3, §2.8, §2.11, §2.12
- References /Guidance Material
 - Doc 8896, Doc 9873, WMO N°1100, Doc 10003, Doc, 9328, Doc 9377

Potential Deficiency and Impacts if not implemented

- 1) **Lack of local routine and local special reports** (disseminated at the aerodrome of origin) may deprive aircraft arriving at /departing from the aerodrome of **information on hazardous weather conditions at the airport, which constitute a safety risk.**
- 2) **Lack of routine and special reports** (disseminated beyond the aerodrome of origin in an appropriate format) **may affect the effectiveness of the flight planning and may affect efficiency and safety** of aircraft in-flight in case of failure of VOLMET broadcast and D-VOLMET services.



Aero. Met. Forecast Services

MET Related regulations and Procedures

- SARPs & Requirements
 - ICAO Annex 3: Chap.: 3, 6; App.:2,5
 - AFI eANP Volume II Part V: Table II-2; §2.4 - §2.8, §3.5, §3.6
- References /Guidance Material
 - Doc 8896, WMO N°1100, Doc 10003, Doc 9377

Potential Deficiency and Impacts if not implemented

The failure to provide aerodrome meteorological forecasts, or the provision of aerodrome meteorological forecasts **not complying with ICAO related SARPs** may adversely affect the safety of flight operations including descent, landing and take-off phases.



Aero. Met. Warnings Services

MET Related regulations and Procedures

- SARPs & Requirements
 - ICAO Annex 3: Chap.: 7; App.: 6
- References /Guidance Material
 - Doc 8896, Doc WMO N°1100, Doc 9817, Doc 9377

Potential Deficiency and Impacts if not implemented

The lack of providing information on hazardous weather phenomena at the aerodrome in the form of aerodrome warnings (AD WRNG, WS WRNG and Alerts) may lead to safety issues for :

- **Aircraft on the ground**, parked aircraft, and the aerodrome facilities and services
- **Aircraft on the approach path** or take-off path or during circling approach may experience WS in the approach/take-off paths.



Aero. Climatology Information Services

MET Related regulations and Procedures

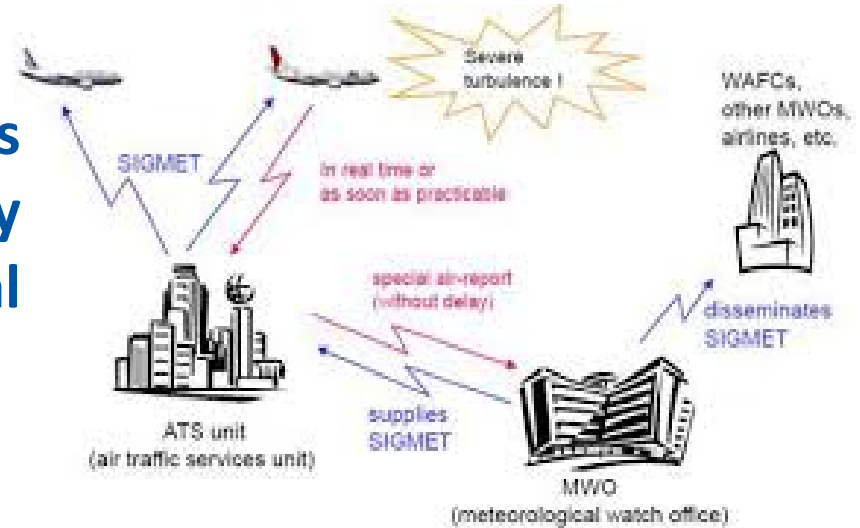
- SARPs & Requirements
 - ICAO Annex 3: Chap.: 8; App.: 7
- References /Guidance Material
 - Doc 8896, Doc WMO N°1100,

Potential Deficiency and Impacts if not implemented

- The **lack of climatological information** may cause challenges for the design and planning of infrastructure, flight routes and airspace management
- The **lack of historical meteorological observations, forecasts, advisories and warnings** may cause concerns for incident and accident investigations

②

MET Minimum Reporting Areas in the Area of Responsibility (AoR) of the Meteorological Watch Offices (MWOs).



SIGMET Services

MET Related regulations and Procedures

- SARPs & Requirements
 - ICAO Annex 3: Chap. :3,7; App.:6
 - AFI eANP Volume II Part V: Table II-1 ; §2.8, §2.9, §3.5
- References /Guidance Material
 - Doc 8896, Doc WMO N°1100, Doc 10003, Doc 9377

Potential Deficiency and Impacts if not implemented

The lack of provision of SIGMET information in accordance with ICAO MET related SARPs will keep aircraft in-flight out of information on en-route hazardous weather phenomena which may adversely affect the safety.



AIRMET Services *(Where applicable)*

MET Related regulations and Procedures

- SARPs & Requirements
 - ICAO Annex 3: Chap.: 3,7; App.:6
 - AFI eANP Volume II Part V: §2.8
- References /Guidance Material
 - Doc 8896, Doc WMO N°1100, Doc 10003, Doc 9377

Potential Deficiency and Impacts if not implemented

The failure to provide airspace users operating in the low layers with the **information on en-route hazardous phenomena** (including the development of those phenomena in time and space), **may cause safety risks to low-level flights.**



GAMET Services

MET Related regulations and Procedures

- SARPs & Requirements
 - ICAO Annex 3: Chap.: 6; App.: 5
- References /Guidance Material
 - Doc 8896, Doc 10003, Doc 9377

Potential Deficiency and Impacts if not implemented

The lack of area forecasts covering the layer between the ground and flight level 100 (or up to flight level 150 in mountainous areas, or higher, where necessary) may adversely cause safety risks to aircraft operating at the low levels.



AIREP Services

MET Related regulations and Procedures

- SARPs & Requirements
 - ICAO Annex 3: Chap.: 5; App. : 4, 6
- References /Guidance Material
 - Doc 8896, WMO N°1100, Doc 9377

Potential Deficiency and Impacts if not implemented

The absence of **air-report /special air-report** may deprive aircraft of relevant information on weather phenomena (**Icing, TURB, WS, Volcanic eruption, Volcanic ash, etc.**), which may adversely affect the safety of **other aircraft operating in the affected areas.**

③

MET Minimum Reporting Areas in the AoR of the Global /Regional Centres



The image contains two main parts. The top part is a diagram titled "Global Observing System" showing various data sources: AIRCRAFT, POLAR ORBITING SATELLITE, GEOSTATIONARY SATELLITE, OCEAN DATA BUOY, WEATHER SHIP, SURFACE STATION, UPPER-AIR STATION, WEATHER RADAR, and AUTOMATIC STATION. Red dashed lines represent data transmission paths to a central "SATELLITE GROUND STATION". The bottom part is a cover for "Guidance on the Harmonized WAFS Grid point forecasts for CB Cloud, Icing and Turbulence" published by WAFS London and WAFS Washington in May 2013. It features a large image of an airplane and three smaller thumbnail images labeled "Introduction", "About the Data", and "Using the Data". Logos for NOAA and Met Office are also present.



Figure 2.3 WIFS and SADIS Area Designations

WAFS Services

MET Related regulations and Procedures

- SARPs & Requirements
 - ICAO Annex 3: Chap.: 3; App.:2
 - AFI eANP Volume I Part V: §2.1, §2.2
- References /Guidance Material
 - Doc 8896, WMO N°1100, Doc 10003

Potential Deficiency and Impacts if not implemented

- In the Africa-Indian Ocean Region, WAFS products in digital form should be disseminated to AFI States by WAFC London using the Secure SADIS FTP service and/or WIFS.
- The inadequate ability of a State to receive and disseminate WAFS services in accordance with the related ICAO SARPs will mainly cause safety concerns for :
 - a) pre-flight planning by operators;
 - b) in-flight re-planning by operators;
 - c) use by flight crew members before departure; and
 - d) aircraft in flight

TCAC Services



MET Related regulations and Procedures

- **SARPs & Requirements**
 - ICAO Annex 3: Chap.: 3; App.2
 - AFI eANP Volume I Part V: §2.5
 - AFI eANP Volume II Part V: Table AFI MET II-1
- **References /Guidance Material**
 - Doc 8896, Doc WMO N°1100, Doc 10003, Doc 9377

Potential Deficiency and Impacts if not implemented

- In the AFI Region, the Tropical Cyclone Advisory Centre (TCAC) **La Reunion** has been designated as the **AFI TCAC to prepare tropical cyclone advisory information** for the Africa-Indian Ocean Region, and send it to the MWOs in its area of responsibility; other TCACs whose areas of responsibility may be affected; WAFCs, Int. OPMET databanks.
- Failure by the MWOs to develop capabilities to receive and deal with TC advisories issued by TCAC La reunion **in accordance with ICAO related SARPs** will cause safety issues to airspace users operating in the affected areas.



Remote Monitoring & Management (RMM) Services

MET Related regulations and Procedures

- SARPs & Requirements
 - ICAO Annex 3: Chap.: 3, §3.1, §3.2, §3.5, §3.8; App.2
 - AFI eANP Volume I Part V: §2
- References /Guidance Material
 -

Potential Deficiency and Impacts if not implemented

- In the AFI Region, SADIS Services Provider State **remotely** provides agreed Aeronautical Meteorological Offices States with SADIS products, technical and administrative messages.
- States that fail to receive these products and technical/administrative information may experience some difficulties to adequately respond to the airspace users' needs in terms of regular and reliable weather information.

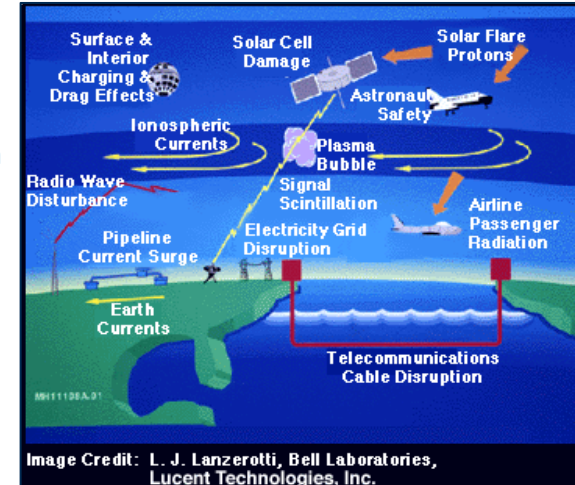
Space Weather Advisory Information

MET Related regulations and Procedures

- SARPs & Requirements
 - ICAO Annex 3 Chap.: 3 §3.8 ; App.: 2
 - APIRG/23 Conclusion 29; 30
- References /Guidance Material
 - Doc 8896, Doc WMO N°1100, Doc 10100, Doc 9377

Potential Deficiency and Impacts if not implemented

- Disrupt HF radio COM
- Airline COM affected
- Satellite COM disruption
- Radiation exposure to pilots & crew
- Astronauts (radiation)
- Satellite failures
- Radio Navigation (GPS)





Next steps

- Minimum Reporting Areas (MRA) in MET
 - **First release of the MRA** to be used for reporting deficiencies in MET;
 - **Dynamic**, and as such are subject to be maintained up to date with respect to the update of the BBBs in accordance with the **SARPs**.
 - **Dependent on regional requirements and priorities** in terms of implementation of MET facilities and services.

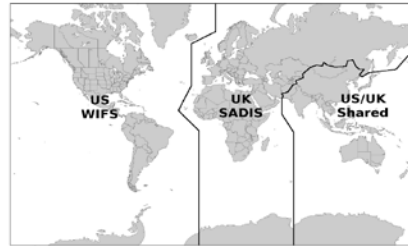


Figure 2-1 WIFS and SADIS Area Designations

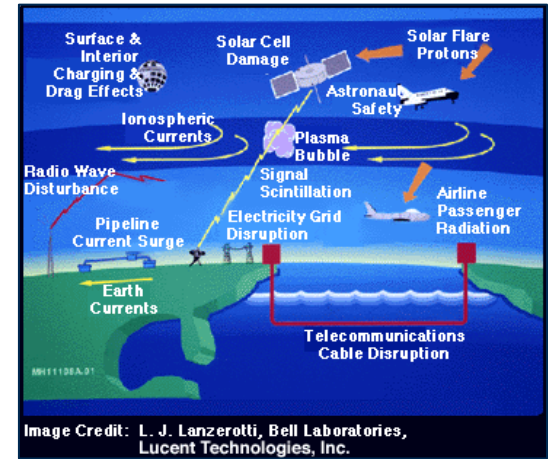
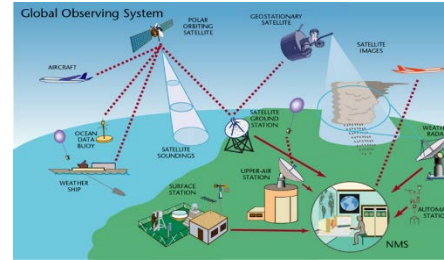
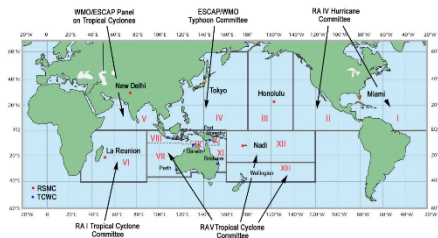
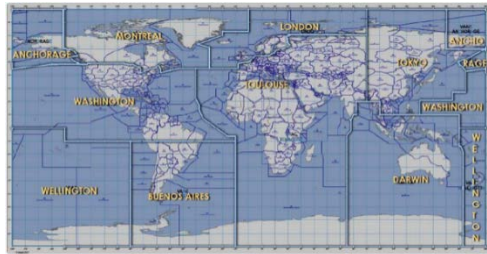


Image Credit: L. J. Lanzerotti, Bell Laboratories, Lucent Technologies, Inc.

Guidance on the Harmonized WAFS Grid point forecasts for CB Cloud, Icing and Turbulence

WAFS London and WAFS Washington May 2013

Introduction

About the Data

Using the Data



ICAO

North American
Central American
and Caribbean
(NACC) Office
Mexico City

South American
(SAM) Office
Lima

ICAO
Headquarters
Montréal

Western and
Central African
(WACAF) Office
Dakar

European and
North Atlantic
(EUR/NAT) Office
Paris

Middle East
(MID) Office
Cairo

Eastern and
Southern African
(ESAF) Office
Nairobi

Asia and Pacific
(APAC) Sub-office
Beijing

Asia and Pacific
(APAC) Office
Bangkok



THANK YOU