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ICAO NACC Regional Office, Mexico City, 29 August - 1 September 2022

Agenda Item 4: NACC/WG Work Programme Update to 2024

4.4 Development/updating of national air navigation plans

**VERIFICATION OF THE BASIC BUILDING BLOCKS (BBB) FOR MET
IN THE CAR REGION**

(Presented by the Secretariat)

EXECUTIVE SUMMARY	
As part of the MET Programme, this Working Paper presents the progress and a prototype of the forms needed to report, monitor and follow up on the implementation of air navigation Basic Building Blocks (BBB) of the Meteorological Services for the International Air Navigation as part of the CAR/SAM Regional Dashboard.	
Action:	As indicated on numeral 4.1.
<i>Strategic Objectives:</i>	<ul style="list-style-type: none">• Safety• Air Navigation Capacity and Efficiency• Environmental Protection
<i>References:</i>	<ul style="list-style-type: none">• ICAO Annex 3 - Meteorological Services for the International Air Navigation• GREPECAS Programmes and Projects Committee (PPRC) Fourth Virtual Meeting (ePPRC/04) Online, 21 – 22 April 2022

1. Introduction

1.1 GREPECAS Conclusion 19/09 required States to support the establishment of a CAR/SAM Regional Dashboard to be implemented for GREPECAS/20, as well as to provide ICAO with the information and data sets necessary for its implementation.

1.2 GREPECAS Conclusion 19/02 requested the States to determine the necessary mechanisms to verify the effective implementation of the BBBs corresponding to the Meteorological Service for international air navigation (MET).

1.3 The CAR Region through the NACC Systemic Assistance Programme (SAP) has made progress in the development of the necessary forms to facilitate the States to advance in the finalization of the referred conclusions.

1.4 The ePPRC/04 Meeting reviewed the progress and a prototype of the forms needed to report, monitor and follow up on the implementation of air navigation BBB of the Meteorological Services for the International Air Navigation.

2. Analysis

2.1 The Global Air Navigation Plan (GANP) portal presents the BBB framework for MET services <https://www4.icao.int/ganpportal/BBB>.

2.2 The technical teleconferences of the NACC SAP conducted with the CAR States facilitated the discussion of fundamental concepts, simplifying the exchange of information and the analysis of the BBB framework for MET services as proposed by the GANP.

2.3 The NACC Regional Office made progress in determining the most relevant metrics and indicators to be measured and displayed, as well as the configuration of the necessary form to facilitate the record of information through the *Power BI* platform as part of the CAR/SAM Regional Dashboard.

2.4 The **Appendix** to this Working Paper presents the progress made.

3. Conclusions

3.1 The dashboard will provide relevant information for planning, decision-making, and the development of future assistance activities based on realistic and relevant information.

3.2 Collaborative work on the platform between civil aviation authorities, meteorological authorities and entities that provide the meteorological service, has shown great potential to facilitate the collection, processing, storage and visualization of the reports in a manner consistent with the dynamic nature of the basic building blocks.

4. Suggested action:

4.1 The Meeting is invited to:

- a) note the development achieved in preparation for GREPECAS/20;
- b) support any other action that due to this work is required to the CAR States and other interested parties;
- c) urge States and international organizations to provide the necessary information to feed the dashboard when the final version of the prototype is available

APPENDIX

VERIFICATION OF THE BASIC BUILDING BLOCKS (BBB) FOR MET IN THE CAR REGION

Basic Building Blocks (BBB) Options analysis for the Dashboard in the Aeronautical Meteorology (MET)

Objectives: To provide the necessary information to feed the Dashboard for the review of the air navigation areas implemented, in order to provide important information for planning, decision-making and the development of future activities based on coherent information, easy to use and established according to a common language.

To establish objective and standardized measurement mechanisms that provide the necessary information for the continuous improvement of the Basic Building Blocks (BBBs) in the area of Aeronautical Meteorology (MET).

- IMP: Implemented
- PAR: Partially Implemented
- DEV: Under Development
- PLN: Under Planning
- EFOD: Electronic Filing of Differences system

Requirement	Application area	Reference Annex 3	Reference in National Regulation	Reference to Related Docs.	Implementation Status (IMP/PAR/DES/PLN)	Implementation percentage (if applicable)	A difference was reported in EFOD
Has the Meteorology Authority been designated?	MET Authority	2.1.4					
Have Agreements been established between Air Traffic Services (ATS) and MET?	MET Provider	2.1.1					
Have Cost Recovery procedures been established?	MET Authority						
Do the Aerodrome Meteorological Offices (AMO) have Meteorology technicians?	AMO	2.1.5					
Do the AMOs have forecasting meteorologists?	AMO	2.1.5					
Has a Quality Management System (QMS) been implemented?	MET Authority	2.2.2					
Is the QMS certified?	MET Authority	2.2.3 (Recommendation)					
Are there Manuals and Procedures duly approved?	MET Authority	2.2.4 and 2.2.5 (Recommendation)					
Have audits that demonstrate the application of the QMS been carried out?	MET Authority	2.2.6					
Have measures been taken to determine and correct the cause of deficiencies detected in the audits?	MET Authority	2.2.6					
Is there a QMS training matrix?	MET Authority			WMO Guidance. Doc. 1100			
Have personnel been trained according to the Training Matrix established in the QMS?	MET Authority			WMO Guidance. Doc. 1100			
Are there any AMOs?	MET Authority	3.3.1					
Is the AMO properly located to perform all the functions that are required?	AMO	3.3.2					
Does your State have a Meteorological Watch Office (MWO)?	MET Authority	3.4					
Is your State in charge of a Volcanic Ast Advisory Center (VAAC)?	MET Authority	3.5					
Is there a State Volcano Observatory?		3.6					

Requirement	Application area	Reference Annex 3	Reference in National Regulation	Reference to Related Docs.	Implementation Status (IMP/PAR/DES/PLN)	Implementation percentage (if applicable)	A difference was reported in EFOD
Has a Letter of Agreement been established between the MET service provider and the State Volcano Observatory?	MET Authority						
Is your State in charge of a Tropical Cyclone Warning Centre?	MET Authority	3.7					
Is your state in charge of a Space Weather Centre?	MET Authority	3.8					
Are there weather stations at the aerodromes?	MET Authority/MET Provider	4.1					
Are weather stations inspected at sufficiently frequent intervals to ensure that a high standard of observation is maintained?	MET Authority/MET Provider	4.1.4					
Have integrated automatic systems for automatic equipment been established to obtain, process, disseminate and present on screen in real time the meteorological parameters that influence landing and take-off operations?	MET Authority/MET Provider	4.1.5					
Are Human Factors principles observed and back-up procedures Human Factors principles and include back-up procedures in the design of integrated automatic systems?	MET Authority/MET Provider	4.1.5					
Have agreements been established between ATS and MET for the use of data from meteorological stations?	MET Authority/MET Provider	4.2					
Are ATS and MET personnel aware of the content of the Agreement and has it been properly disseminated to ATC and MET personnel?	AMO						
Are ordinary local reports (MET REPORTS) issued?	AMO	4.3.2					
Are routine Aerodrome meteorological reports (METAR) issued?	AMO	4.3.2					
Are local special reports issued?	AMO	4.4.2					
Are aerodrome special meteorological reports (SPECI) issued?	AMO	4.4.2					
Are Volcanic Activity Observations and Reports issued?	AMO	4.8					
Is retransmission of special air reports from ATS to MET carried out?	AMO	5.8					

Requirement	Application area	Reference Annex 3	Reference in National Regulation	Reference to Related Docs.	Implementation Status (IMP/PAR/DES/PLN)	Implementation percentage (if applicable)	A difference was reported in EFOD
Are Aerodrome Forecasts (TAF) and Amended TAF (TAF AMD) issued?	AMO	6.2					
Are forecasts constantly reviewed and, when necessary, are amendments issued without delay?	AMO	6.2.4					
Are landing forecasts made?	AMO	6.3					
Are Forecasts for take-off made?	AMO	6.4					
Are area and route forecasts prepared, other than those issued within the framework of the World Area Forecast (WAFS)?	MWO	6.5					
Are area forecasts issued for low-altitude flights or information regarding en-route meteorological phenomena that may affect the safety of low-altitude aircraft operations (AIRMET)?	AMO	6.5.3 Amendment 79					
Is information issued regarding en-route weather phenomena that may affect the safety of aircraft operations (SIGMET) for wind shear (WS)?	MWO	7.1.1	RAC-03.495				
Is the validation and cancellation of the SIGMET information for volcanic ash (VA) carried out?	MWO	7.1.2 and .3					
Is Volcanic Ash and Tropical Cyclone information included in the SIGMET information for tropical cyclones (WC)?	MWO	7.1.4 to .1.6					
Are Aerodrome Warnings issued?	AMO	7.3					
Are WS warnings issued?	AMO	7.4.1					
Is the proper cancellation of WS warnings and alerts issued?	AMO	7.4.2					
Are the aerodrome climatological tables prepared?	MET Authority/MET Provider	8.1					
Are aerodrome climatological summaries prepared?	MET Authority/MET Provider	8.2 a)					
Is the updating of climatological tables carried out within a period of time agreed with the aeronautical users?	MET Authority/MET Provider	8.2 b)					
Are copies of observed meteorological data made available?	MET Authority/MET Provider	8.4					

Requirement	Application area	Reference Annex 3	Reference in National Regulation	Reference to Related Docs.	Implementation Status (IMP/PAR/DES/PLN)	Implementation percentage (if applicable)	A difference was reported in EFOD
<p>Is information supplied to operators and flight crew members prior to flight?</p> <p>Does the meteorological information provided to operators and flight crewmembers contain time, altitude and geographical extent?</p>	<p>MET Authority/MET Provider</p>	<p>9.1.1</p>					
<p>Is the meteorological information provided to operators and flight crew members up-to-date and includes:</p> <p>a) forecasts of:</p> <ol style="list-style-type: none"> 1) wind and temperature at 2) humidity at altitude; 3) geopotential altitude of flight levels; 4) flight level and tropopause temperature; 5) maximum wind direction, speed and flight level; 6) Forecast Significant Weather Phenomena (SIGWX); and 7) cumulonimbus clouds, icing and turbulence. <p>b) METAR or SPECI (including trend forecasts) and destination;</p> <p>c) TAF or amendments to the same for the scheduled departure and landing aerodromes, and for the post-off alternate, en-route and destination aerodromes;</p> <p>d) Forecasts for take-off;</p> <p>e) SIGMET information and appropriate special air-reports related to the entire route;</p> <p>f) volcanic ash and tropical cyclone advisory information relevant to the entire route;</p> <p>g) as determined by regional air navigation agreement, Area Forecast for Low-Altitude Flights (GAMET) and/or Area Forecasts for Low-Altitude Flights prepared in cartographic form as a complement to the issuance of AIRMET information, as well as AIRMET information for low-level flights related to the entire route.</p>	<p>MET Authority/MET Provider</p>	<p>9.1.3 and 9.1.4</p>					

Requirement	Application area	Reference Annex 3	Reference in National Regulation	Reference to Related Docs.	Implementation Status (IMP/PAR/DES/PLN)	Implementation percentage (if applicable)	A difference was reported in EFOD
h) aerodrome warnings for the local aerodrome; i) meteorological satellite images; j) ground weather radar information, and k) advisory information on space weather conditions relevant to the entire route.	MWO	9.1.5					
Is the broadcast made in World Area Forecast Center (WAFc) format? Are forecasts of significant weather (SIGWX) issued in chart format and provided at least 3 hours prior to departure?	MWO	9.1.7 and 9.1.8					
Is a briefing or consultation provided upon request to flight crewmembers or other flight operations personnel?	AMO	9.2.1 Amendment 79					
Is flight documentation issued?	AMO	9.3					
When automated pre-flight information systems are used to provide and display meteorological information to operators and flight crewmembers for self-reporting, flight planning, and flight documentation purposes, does the information provided and displayed conform to the provisions of 9.1 to 9.3?	AMO	9.4					
Does the aerodrome meteorological office or the MWO provide meteorological information for use by aircraft in flight to its corresponding unit of air traffic services and through the meteorological information service for aircraft in flight (VOLMET) by data link (D- VOLMET) or VOLMET broadcasts?	AMO	9.5					
Does the aerodrome meteorological office or the associated MWO provide updated meteorological information that is necessary for the performance of the functions of the air traffic unit?	AMO	10.1					

Requirement	Application area	Reference Annex 3	Reference in National Regulation	Reference to Related Docs.	Implementation Status (IMP/PAR/DES/PLN)	Implementation percentage (if applicable)	A difference was reported in EFOD
Do aerodrome meteorological offices or designated MWOs provide search and rescue units with the meteorological information they require, in a mutually agreed manner?	AMO	10.2					
Does the meteorological authority provide the aeronautical information services units with the updated meteorological data they need to perform their functions?	MET Authority/MET Provider	10.3					
Does the communications service provider provide adequate telecommunications facilities for aerodrome meteorological offices?	AMO	11.1.1					
Are the telecommunications facilities adequate to provide communications between the Aeronautical Mobile Service (AMS) and the Aerodrome Control Tower (TWR)?	AMO	11.1.1					
Are the telecommunications facilities adequate to provide communications between AMS and the Approach Control Office (APP)?	AMO	11.1.1					
Are the telecommunications facilities adequate to provide Communications between AMS and the Flight Information Center (FIC)?	AMO	11.1.2					
Are the telecommunications facilities adequate to provide Communications between AMS and the Area Control Center (ACC)?	AMO	11.1.2					
Are the telecommunications facilities adequate to provide Communications between AMS and the Search and Rescue Region (SRR)?	AMO	11.1.2					

Requirement	Application area	Reference Annex 3	Reference in National Regulation	Reference to Related Docs.	Implementation Status (IMP/PAR/DES/PLN)	Implementation percentage (if applicable)	A difference was reported in EFOD
Are the telecommunications facilities adequate to provide communications between AMS and the Rescue Coordination Center (RCC)?	AMO	11.1.2					
Adequate telecommunications facilities to provide Communications between AMO and ACC or FIC?	AMO	11.1.4					
Adequate telecommunications facilities to provide Communications between AMO and SRR?	AMO	11.1.4					
Adequate telecommunications facilities to provide Communications between AMO and RCC?	AMO	11.1.5					
Adequate telecommunications facilities to provide Communications between AMSs?	AMO						
Are the telecommunications facilities adequate to provide Communications between AMS and AMO?	AMO						
Are telecommunications facilities adequate to provide Communications between MWO and VAAC Washington?	AMO	11.1					
Are aeronautical fixed service communications and the public Internet used for the issuance of weather bulletins?	AMO	11.2					
Is the content and format of the meteorological information transmitted to aircraft and that is transmitted by aircraft in binary format?	AMO	11.3					
Does the content and format of meteorological information transmitted to aircraft and that is transmitted by aircraft comply with the provisions of Annex 3?	AMO	11.4					

Requirement	Application area	Reference Annex 3	Reference in National Regulation	Reference to Related Docs.	Implementation Status (IMP/PAR/DES/PLN)	Implementation percentage (if applicable)	A difference was reported in EFOD
Is the aeronautical data link service (D-VOLMET) content used for the transmission of METAR and SPECI, together with available trend-type forecasts?	AMO	11.5					
Do the aeronautical broadcasting service VOLMET broadcasts contain the METAR and SPECI, together with the trend type forecasts available?	AMO	11.6					
Are there Aeronautical Meteorological Stations?	MET Authority/MET Provider						
Is the location of the Aeronautical Meteorological Stations adequate?	MET Authority/MET Provider						
Is access to the observation point easy or difficult?	AMO						
Are visual displays on AWS, Air Traffic Control (ATC), FIC, RADAR easily accessible?	AMO						
Are there semi-automatic stations?	AMO						
Is the location of the stations in accordance with Annex 3?	MET Authority/MET Provider						
In the displays in the air traffic services units, are the appropriate units of measurement used to represent the meteorological elements?	Aeródromo	Ref: 4.3.3, 4.5.2, 4.6.1, 4.7.1					
Are there additional wind measurement sensors along the runway?	Aeródromo						
Are there additional visual aids from the wind data (ATS units)?	Aeródromo						
Are there transmitters (RVR)?	Aeródromo						
Is there visual display of RVR (ATS units)?	Aeródromo						
Is the location of the Transmissometer in accordance with Annex 3?	Aeródromo						
Forward Scatter Meters	Aeródromo						
Forward Scatter Meter Location	Aeródromo						
Is there a ceilometer?	Aeródromo						

Requirement	Application area	Reference Annex 3	Reference in National Regulation	Reference to Related Docs.	Implementation Status (IMP/PAR/DES/PLN)	Implementation percentage (if applicable)	A difference was reported in EFOD
Is there a visual cloud ceiling display?	Aeródromo						
Is the Skyometer Location adequate?	Aeródromo						
Is there a workstation for the International Satellite Communications System (ISCS), WAFS?	Aeródromo						
Is Satellite Meteorology data received in each AMO?	AMO						
Is Radar data received in each AMO?	AMO						
Is "radiosondeo" data received at each AMO?	AMO						
Is photodetection and Telemetry (LIDAR) data received at each AMO?	AMO						
At aerodromes with frequent wind changes, is WS measurement data received?	AMO						