INTERNATIONAL CIVIL AVIATION ORGANIZATION



Manual of procedures for assessing and overseeing the implementation of the Basic Building Blocks (BBB) CAR/SAM Region
*General aspects
*MET Part

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ICAO



❑ Vision

A safe, secure and sustainable international civil aviation system that connects the world for the benefit of all nations and peoples.

❑ Mission

Leading international civil aviation as a key driver of social and economic development, while improving safety, security, economic development and environmental sustainability for a growing air system.

❑ Three key aspirations

- ✓ Net-Zero Carbon Emissions
- ✓ Connected Transport System
- ✓ Zero Fatalities

❑ High-Priority Enablers

- ✓ ICAO Continuous Organizational Improvement
- ✓ Gender equality and attracting new talent
- ✓ Innovation
- ✓ Partnerships, resource mobilization and financial sustainability

❑ Strategic Objectives



EVERY FLIGHT IS SAFE AND SECURE

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AVIATION IS ENVIRONMENTALLY SUSTAINABLE

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AVIATION DELIVERS SEAMLESS, ACCESSIBLE, AND RELIABLE MOBILITY FOR ALL

AVIATION PROVIDES SEAMLESS, ACCESSIBLE AND RELIABLE MOBILITY FOR ALL.



NO COUNTRY LEFT BEHIND

NO COUNTRY LEFT BEHIND



THE INTERNATIONAL CIVIL AVIATION CONVENTION AND OTHER TREATIES, LAWS AND REGULATIONS ADDRESS ALL CHALLENGES

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THE ECONOMIC DEVELOPMENT OF AIR TRANSPORT ASSURES THE DELIVERY OF ECONOMIC PROSPERITY AND SOCIETAL WELL-BEING FOR ALL

THE ECONOMIC DEVELOPMENT OF AIR TRANSPORT ENSURES THE GENERATION OF ECONOMIC PROSPERITY AND SOCIAL WELL-BEING FOR ALL

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Global Air Navigation Plan (GANP)



GLOBAL STRATEGIC

GLOBAL TECHNICAL

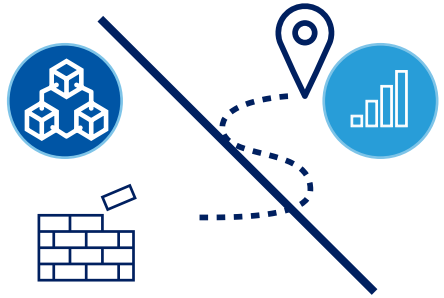
REGIONAL

NATIONAL

Basic Building Blocks (BBB).

Aviation System Block Upgrades (ASBU)

Air Navigation System Performance Ambitions (AN-SPA).



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Principles

PRINCIPLES OF THE PRESCRIPTIVE-BASED APPROACH
PRINCIPLE OF THE RISK-BASED APPROACH
PRINCIPLE OF THE USE OF OBJECTIVE EVIDENCE
PRINCIPLE OF CONTINUOUS IMPROVEMENT
PRINCIPLE OF PROPORTIONALITY
PRINCIPLE OF TRACEABILITY

Oversight methodology

ASSESSMENT PLANNING
DOCUMENT REVIEW
OPERATIONAL VERIFICATION
RECALCULATION DETERMINATION OF THE IMPLEMENTATION LEVEL

ASSESSMENT RECORDING AND DOCUMENT MANAGEMENT
RESULTS

Assessment and self-assessment methodology

ASSESSMENT PLANNING
DOCUMENT REVIEW
OPERATIONAL VERIFICATION
DETERMINATION OF THE IMPLEMENTATION LEVEL

ASSESSMENT RECORDING AND DOCUMENT MANAGEMENT
RESULTS

Findings management

FINDINGS MANAGEMENT IS THE SET OF ACTIVITIES AIMED AT IDENTIFYING, DOCUMENTING, COMMUNICATING, ANALYZING, CORRECTING AND VERIFYING THE DEVIATIONS, DEFICIENCIES OR GAPS EVIDENCED DURING THE ASSESSMENT AND OVERSIGHT PROCESSES OF THE BASIC BUILDING BLOCKS.

Supporting metrics for the BBBs

When assessing the **Essential Elements**, the fundamental question the assessor must ask is:

Does the capability or service exist and is it available for operational use?

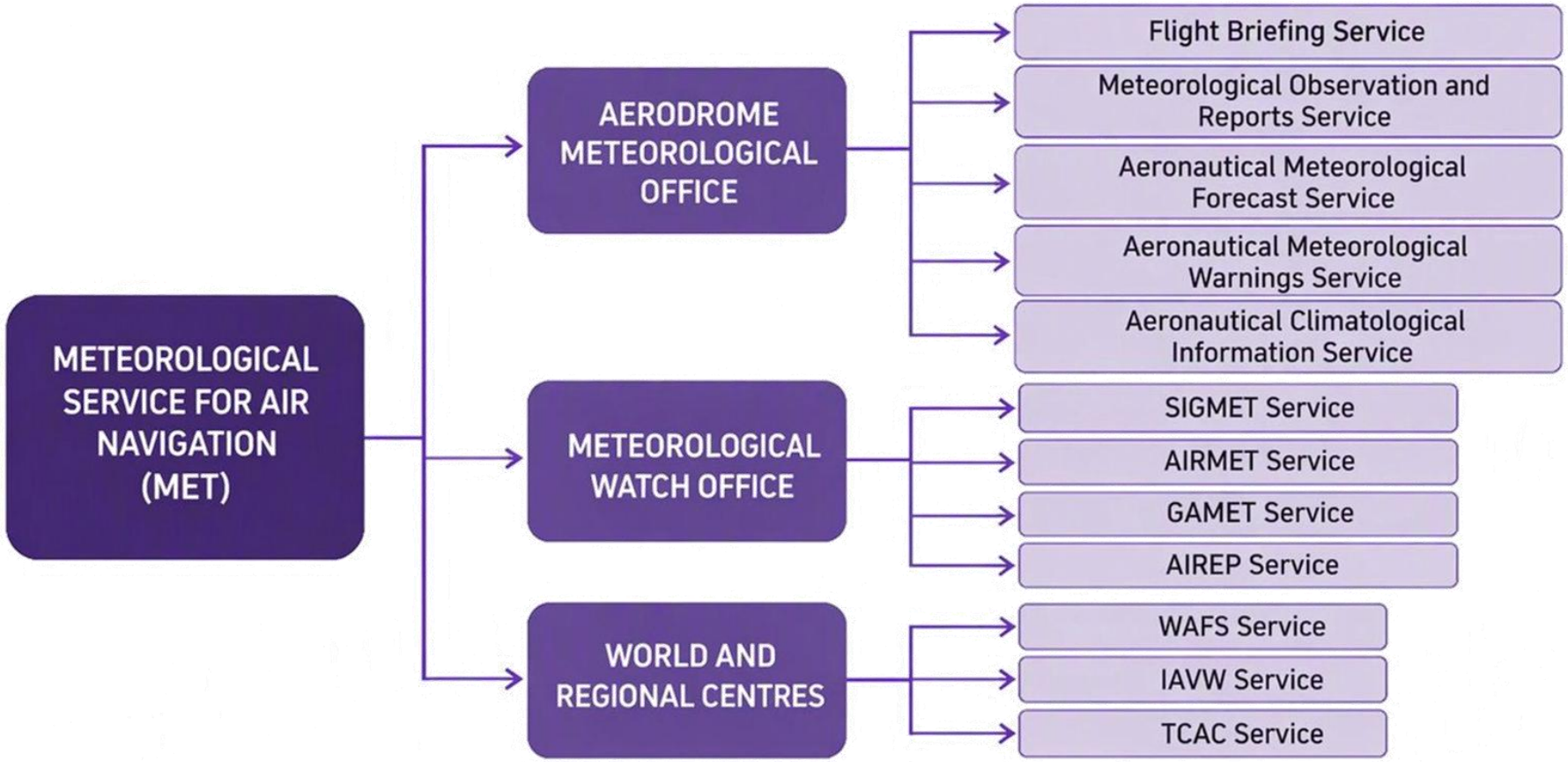
In the case of the **Quality and Continuous Improvement Elements**, the assessment must be aimed at determining:

Whether the capability is adequately managed, controlled and sustained through formal processes that ensure its continuous operation and progressive improvement

Finally, for the **Technological and Interoperable Elements**, the assessment must focus on establishing:

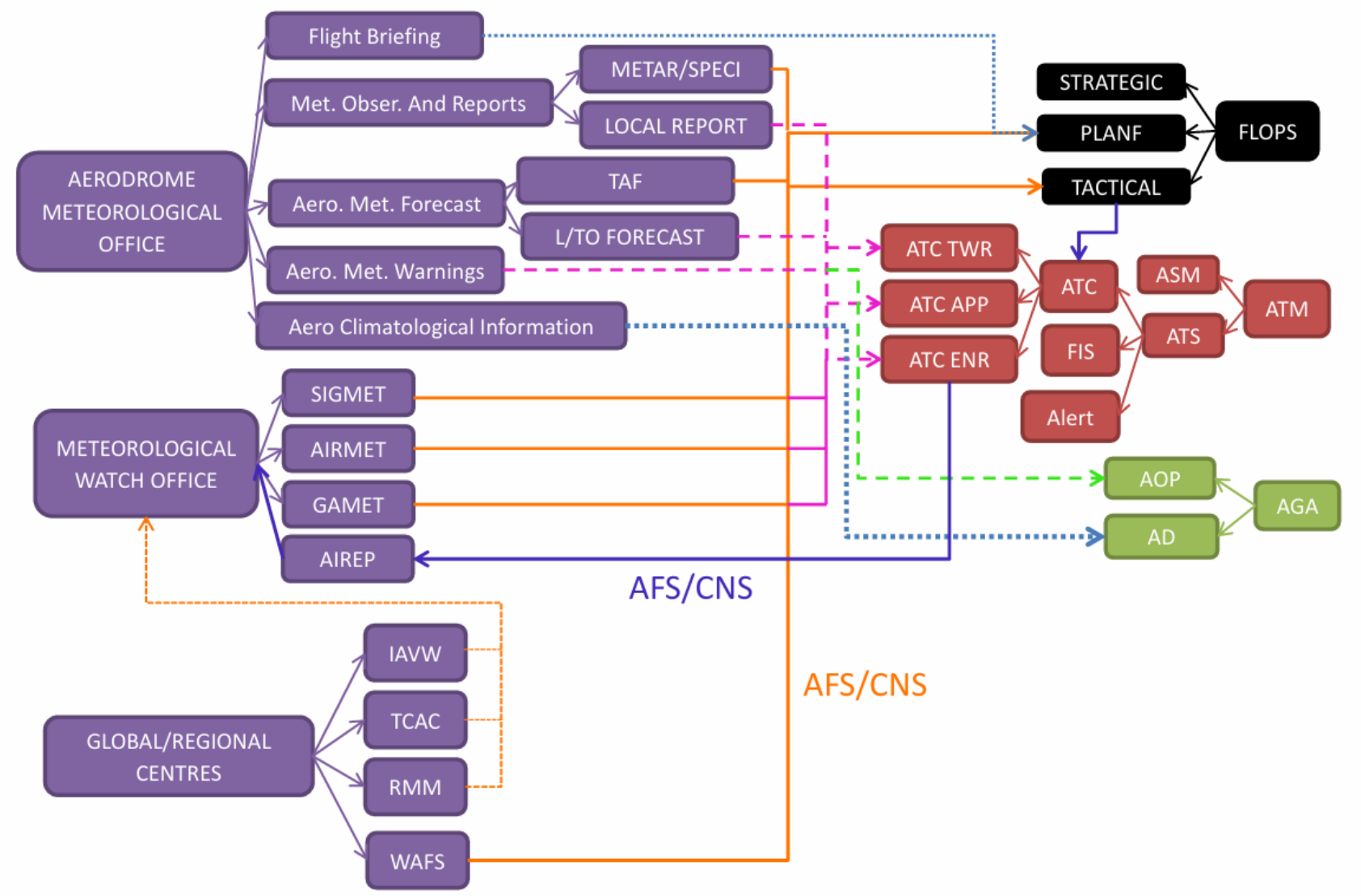
Whether the capability has the technological means, information exchange mechanisms and interoperability necessary to evolve in line with the modernization objectives defined by ICAO, the GANP and the applicable ASBU threads.

Modules and Basic Building Blocks of the Meteorological Service for Air Navigation

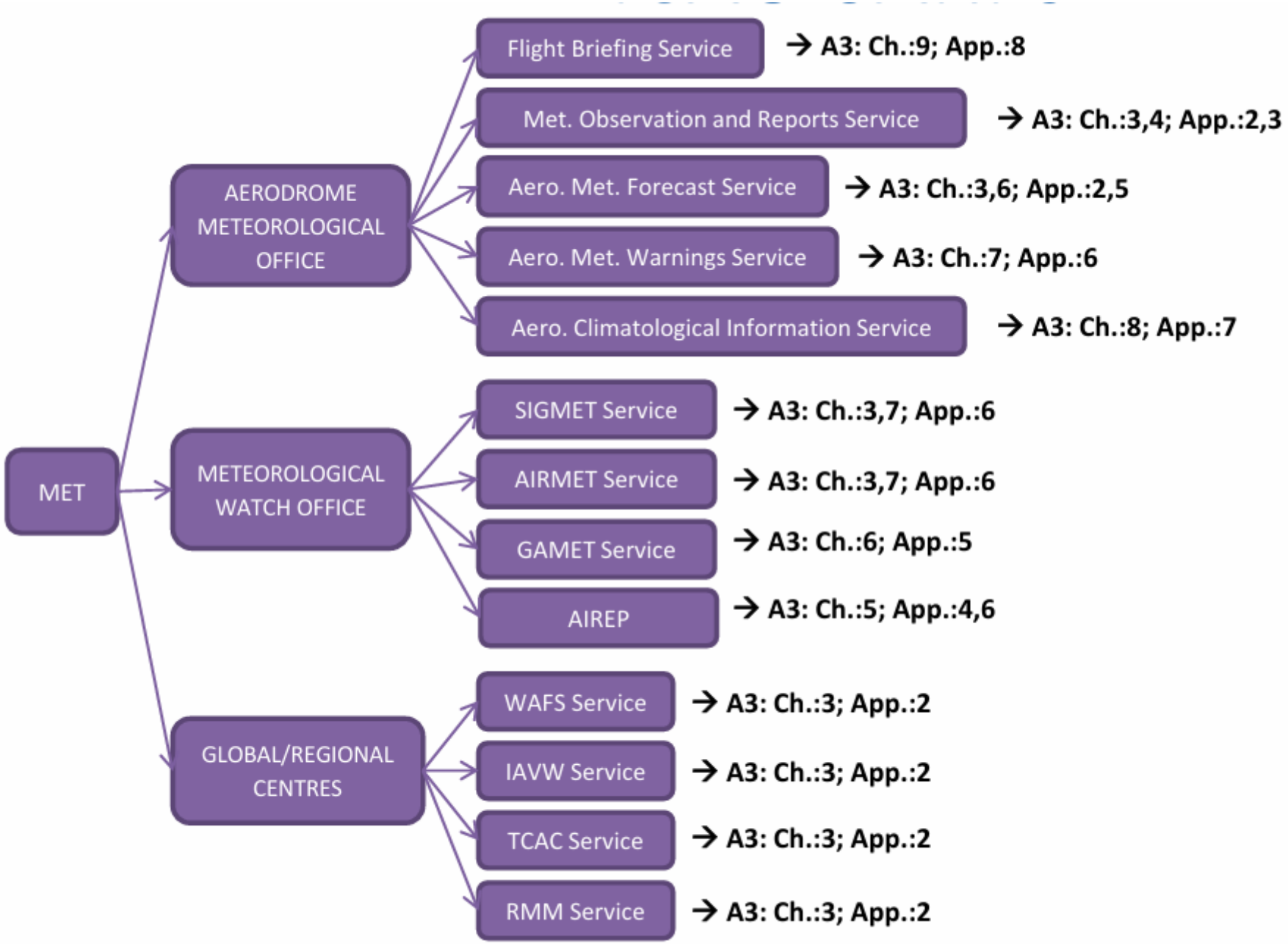


https://ganpportal.icao.int/BBB

Modules and Basic Building Blocks of the Meteorological Service for Air Navigation



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MET
AERODROME METEOROLOGICAL OFFICE
Flight Briefing Service
→ A3: Ch.:9; App.:8
Met. Observation and Reports Service
→ A3: Ch.:3,4; App.:2,3
Aero. Met. Forecast Service
→ A3: Ch.:3,6; App.:2,5
Aero. Met. Warnings Service
→ A3: Ch.:7; App.:6
Aero. Climatological Information Service
→ A3: Ch.:8; App.:7
METEOROLOGICAL WATCH OFFICE
SIGMET Service
→ A3: Ch.:3,7; App.:6
AIRMET Service
→ A3: Ch.:3,7; App.:6
GAMET Service
→ A3: Ch.:6; App.:5
AIREP
→ A3: Ch.:5; App.:4,6
GLOBAL/REGIONAL CENTRES
WAFS Service
→ A3: Ch.:3; App.:2
IAVW Service
→ A3: Ch.:3; App.:2
TCAC Service
→ A3: Ch.:3; App.:2
RMM Service
→ A3: Ch.:3; App.:2

Modules and Basic Building Blocks of the Meteorological Service for Air Navigation

ELEMENTS TO BE ASSESSED AND OVERSEEN	MAIN PURPOSE	SERVICES/PRODUCTS
METEOROLOGICAL OBSERVATION PRODUCTS	Deliver meteorological observations for airspace management and situational awareness.	~~AWOS~~, METAR/SPECI, local reports, AIREP, aeronautical meteorological warnings.
METEOROLOGICAL FORECAST AND WARNING PRODUCTS	Support operational decisions through forecasts and warnings.	TAF, GAMET, SIGMET, AIRMET, TREND, WAFS, IAVW TCA, VAA (warnings and alerts).
CLIMATOLOGICAL AND HISTORICAL PRODUCTS	Compile historical information for climatology, planning and incident investigation.	Climatological tables and summaries and historical information.
TECHNOLOGICAL AIDS FOR THE GENERATION AND DISSEMINATION OF AERONAUTICAL METEOROLOGICAL PRODUCTS AND INFORMATION	Generate and disseminate operational meteorological information.	Technology for the generation and dissemination of products and information for aeronautical purposes.

Modules and Basic Building Blocks of the Meteorological Service for Air Navigation

BBB AREA	ESSENTIAL ELEMENTS LINE (%)	QUALITY AND CONTINUOUS IMPROVEMENT ELEMENTS LINE (%)	TECHNOLOGY AND INTEROPERABILITY ELEMENTS LINE (%)	BBB AREA IMPLEMENTATION LEVEL (%)	IMPLEMENTATION STATUS
MET					
AIM					
ATM					
AOP					
SAR					
CNS					

Modules and Basic Building Blocks of the Meteorological Service for Air Navigation

- **Essential Elements Line (%):** Corresponds to the aggregated result of the supporting metrics (MA) associated with the essential elements of the assessed BBB area.
    - *Essential Elements Line (%) = Σ results of the line of MA / Number of applicable MA*
- **Quality and Continuous Improvement Elements Line (%):** Corresponds to the aggregated result of the MA associated with quality management, performance, competence, continuous improvement and sustainability.
    - *Formula:*
    - *Quality and Continuous Improvement Line (%) = Σ results of the line of MA / Number of applicable MA*
- **Technology and Interoperability Elements Line (%):** Corresponds to the aggregated result of the MA associated with technology, interoperability and information exchange.
    - *Technology and Interoperability Elements Line (%) = Σ results of the line of MA / Number of applicable MA*
- **BBB Area Implementation Level (%)**: Corresponds to the implementation percentage of the BBB area, obtained by integrating the three methodological lines.
    - *BBB Area Implementation (%) = (Essential Elements (%) + Quality and Continuous Improvement (%) + Digital and Interoperability (%)) / 3*
- **Determination of Implementation Status:** Corresponds to the classification of the implementation status of the assessed BBB area, determined from the value obtained in the BBB Area Implementation (%) field and in accordance with the criteria established in the table 3 Status of Implementation BBB

Modules and Basic Building Blocks of the Meteorological Service for Air Navigation

STATUS*	EXPLANATION
N/A	The BBB element is not applicable.
PLANNING	Implementation of the BBB element is planned, but has not yet started.
DEVELOPING	Implementation of the BBB element is under development, but is not yet operational.
PARTIALLY IMPLEMENTED	Implementation of the BBB element is partially completed and/or partially operational, but not all planned implementation phases have been completed yet.
IMPLEMENTED	Implementation of the BBB element has been completed and/or the element is fully operational.

Modules and Basic Building Blocks of the Meteorological Service for Air Navigation



Modules and Basic Building Blocks of the Meteorological Service for Air Navigation

ESSENTIAL ELEMENTS LINE

- **MA-MET-001: METAR (Reliable METAR generation)**
  Supporting metric classification: Quality.
  What does it measure?: Measures the accuracy, completeness and reliability of the METAR reports issued by the State, through the percentage of meteorological observations correctly issued with respect to the total scheduled observations.
  Objective: Verify that METAR reports are generated consistently, completely and in accordance with the requirements established by ICAO, ensuring that the information provided to pilots, ATS units and other aeronautical users is reliable for operational decision-making.

- **MA-MET-002: SPECI (Reliable SPECI generation)**
  Supporting metric classification: Quality.
  What does it measure?: Measures the accuracy, completeness and reliability of the SPECI reports issued by the State, through the percentage of special reports correctly generated with respect to the total SPECI reports issued.
  Objective: Verify that significant changes in meteorological conditions are published correctly and reliably, supporting situational awareness and operational safety.

- **MA-MET-003: AIREP (Availability of aircraft meteorological information)**
  Supporting metric classification: Availability.
  What does it measure?: Measures the State's capacity to receive, process and make available aircraft meteorological reports (AIREP).
  Objective: Verify that information observed in flight is incorporated into the aeronautical meteorological system to complement meteorological watch and operational support processes.

Modules and Basic Building Blocks of the Meteorological Service for Air Navigation

QUALITY AND CONTINUOUS IMPROVEMENT ELEMENTS LINE

- **MA-MET-012: SGC-MET (Meteorological Service Quality Management System)**
  Classification: Compliance.
  What does it measure?: Degree of implementation of the Quality Management System applicable to the Meteorological Service for Air Navigation.
  Objective: Verify that the provider has a formal system to control and improve the quality of meteorological products and services.

- **MA-MET-013: STAFF-COMPETENCE (Competence of meteorological personnel)**
  Classification: Capacity.
  What does it measure?: Percentage of personnel who meet the competence requirements defined for the functions performed.
  Objective: Verify the availability of competent human resources for the provision of the service.

- **MA-MET-014: TRAINING (Compliance with the training program)**
  Classification: Effectiveness.
  What does it measure?: Percentage of training activities carried out with respect to those scheduled according to ICAO/WMO requirements.
  Objective: Verify the maintenance and updating of technical competencies in line with ICAO/WMO.

Modules and Basic Building Blocks of the Meteorological Service for Air Navigation

TECHNOLOGICAL AND INTEROPERABLE ELEMENTS LINE

- **MA-MET-018: AWOS (Availability of the Automated Weather Observing System)**
  Supporting metric classification: Availability.
  What does it measure?: Measures the operational availability of the Automated Weather Observing Systems (AWOS) used to obtain aeronautical meteorological information.
  Objective: Verify that the State has automated weather observing systems that contribute to the continuous and reliable generation of aeronautical meteorological data.

- **MA-MET-019: DIE-MET (Electronic Dissemination and Exchange of Meteorological Information)**
  Supporting metric classification: Capacity
  What does it measure?: Measures the availability of electronic mechanisms for the continuous dissemination of aeronautical meteorological products to authorized users and, in turn, the State's capacity to exchange aeronautical meteorological information through standardized electronic platforms and means.
  Objective: Verify that meteorological systems have mechanisms that facilitate distribution to authorized users and the secure and timely exchange of information with other units and aeronautical users, to facilitate the flow of information needed for operational decision-making.

- **MA-MET-020: DBC (Availability of Climatological Databases)**
  Supporting metric classification: Availability.
  What does it measure?: Measures the availability and accessibility of databases used to store and manage aeronautical climatological and historical information electronically.
  Objective: Verify that the State has adequate electronic mechanisms for the storage, querying and retrieval of climatological and historical information.

	A	B	C	D	E	F
1	KI Code	MA-MET-001	MA-MET-002	MA-MET-003	MA-MET-005	MA-MET-006
2	BBB Framework	BBB-MET	BBB-MET	BBB-MET	BBB-MET	BBB-MET
3	KI Name	METAR (Reliable METAR generation)	SPECI (Reliable SPECI generation)	AIREP (Availability of aircraft meteorological information)	WS (Availability of wind shear observations and information)	TAF (Effectiveness of TAF forecasts)
4	Objective	Verify that METAR reports are generated consistently, completely and in accordance with the requirements established by ICAO, ensuring that the information provided to pilots, ATS units and other aeronautical users is reliable for operational decision-making.	Verify that significant changes in meteorological conditions are published correctly and reliably, supporting situational awareness and operational safety.	Verify that information observed in flight is incorporated into the aeronautical meteorological system to complement meteorological watch and operational support processes.	Verify that operational mechanisms exist for the detection and dissemination of wind shear phenomena that may affect takeoff and landing operations.	Assess the State's capacity to generate aeronautical forecasts that adequately represent the expected meteorological conditions and support air operations planning.
5	What does it measure?	Measures the accuracy, completeness and reliability of the METAR reports issued by the State, through the percentage of meteorological observations correctly issued with respect to the total scheduled observations.	Measures the accuracy, completeness and reliability of the SPECI reports issued by the State, through the percentage of special reports correctly generated with respect to the total SPECI reports issued.	Measures the State's capacity to receive, process and make available aircraft meteorological reports (AIREP).	Measures the State's capacity to generate wind shear observations, reports and warnings at aerodromes where this service is required.	Measures the percentage of agreement between the meteorological variables forecast in TAFs and the conditions subsequently observed through METAR and SPECI during their validity period.
6	Supporting metric type	MA	MA	MA	MA	MA
7	Supporting metric classification	Quality	Quality	Availability	Availability	Effectiveness
8	Verification method	Document review and operational verification	Document review and operational verification	Document review and operational verification	Document review and operational verification	Document review and operational verification
9	Unit of measure	%	%	%	%	%
10	Formula detail	(SA/MP)*100	(SP/SE)*100	(AR/AT)*100	(WS/WD)*100	(FT/VE)*100
11	Formula	=(B13/B15)*100	=(C13/C15)*100	=(D13/D15)*100	=(F13/F15)*100	=(G13/G15)*100
12	Variable 1 name	SA=METAR correctly transmitted	SP=SPECI correctly transmitted	AR=AIREP processed	WS=Wind shear events managed	FT=TAF variables correct
13	Variable 1 value					
14	Variable 2 name	MP=METAR scheduled	SE=SPECI issued	AT=AIREP received	WD=Wind shear events detected	VE=TAF variables evaluated
15	Variable 2 value					
16	Variable 3 name (if applicable)	N/A	N/A	N/A	N/A	N/A
17	Variable 3 value	N/A	N/A	N/A	N/A	N/A
18	Information source	METAR records	SPECI records	AIREP records	WS records	TAF/METAR/SPECI records
19	Measurement frequency	Monthly	Monthly	Quarterly	Quarterly	Semiannual
20	Measurement owner	MET AMO Provider	MET AMO Provider	MET AMO Provider	MET AMO Provider	MET AMO Provider
21	Target	>=98%	>=98%	>=95%	>=95%	>=80%
22	Alert threshold	<80%	<90%	<90%	<90%	<75%
23	KI Value	=B11	=C11	=D11	=F11	=G11
24	Remarks					

BBB Area	Essential Elements Line (%)	Quality and Continuous Improvement Elements Line (%)	Technology and Interoperability Elements Line (%)	BBB Area Implementation Level (%)	Implementation Status
MET	= Σ results (MA-MET-001 MA-MET-002 MA-MET-003 MA-MET-004 MA-MET-005 MA-MET-006 MA-MET-007 MA-MET-008 MA-MET-009 MA-MET-010 MA-MET-011 / 12	= Σ results (MA-MET-012) MA-MET-013 MA-MET-014 MA-MET-015 MA-MET-016 MA-MET-017) / 6	= Σ results (MA-MET-018 MA-MET-019 MA-MET-020 MA-MET-021) / 4	= Σ results of the MA-MET (Essential Elements Line Quality and Continuous Improvement Elements Line Technology and Interoperability Elements Line) / 3	N/A or Planning or Developing or Partially Implemented or Implemented

Thank You



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