



World Meteorological Organization

Weather • Climate • Water

***Seminar on the Implementation of the
Quality Management System QMS/MET
for the SAM Region***

Lima, Peru, 20 - 24 October
2014

by

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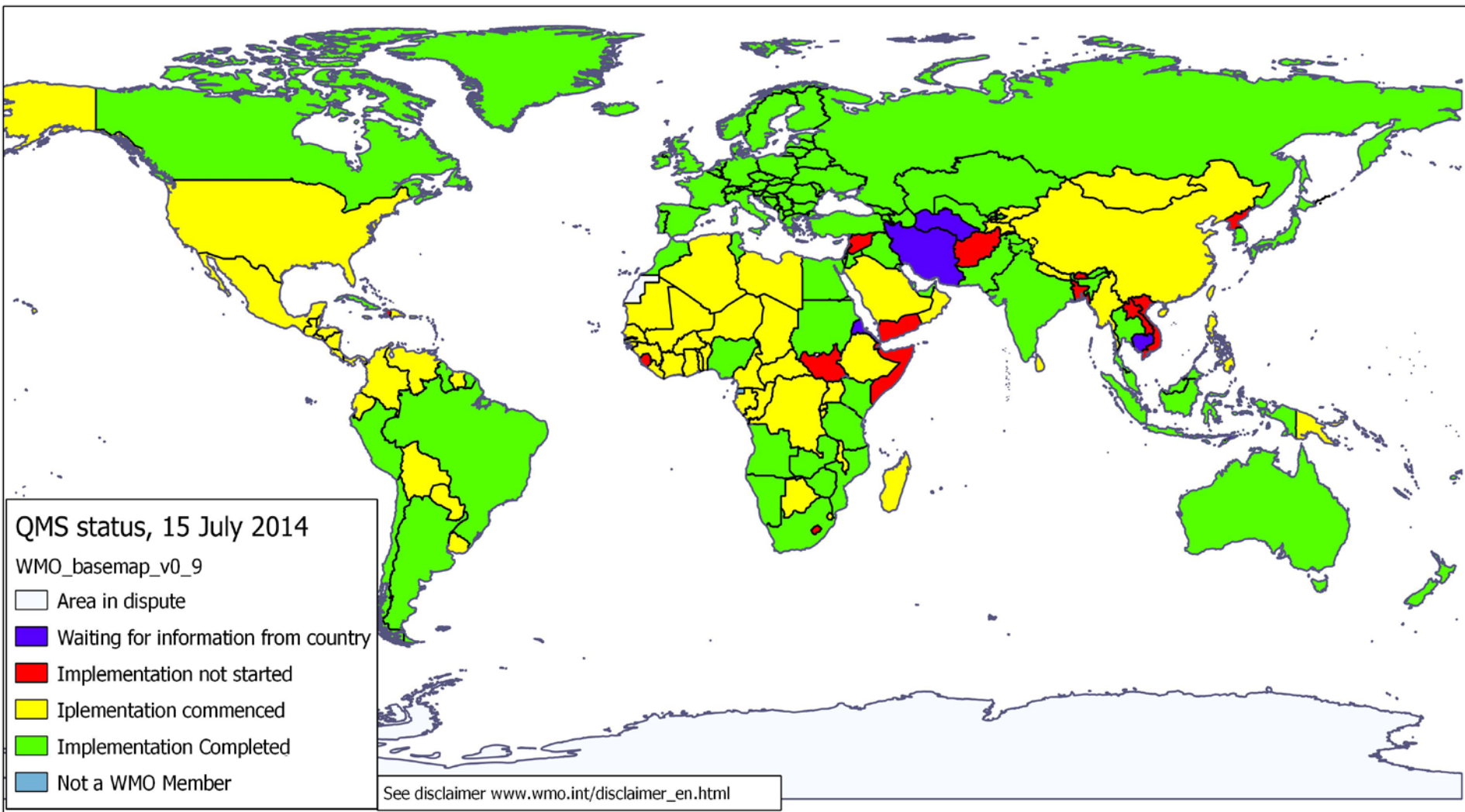
General: Implementation of competency standard

- As of 1 December 2013, competency standards for aeronautical meteorological forecasters (AMF) and aeronautical meteorological observers (AMO), included in WMO Technical Regulations, Vol I, Part II, Chapter 5, came into force
- Members required to assess and provide evidence of the attained competency of their AM personnel and to ensure their continuous professional development
- CAeM provided ample guidance and training material = <http://www.wmo.int/aem> and <http://www.caem.wmo.int/moodle/>
- RA III workshop on competency assessment to be held in Buenos Aires, Argentina, 17-20 November 2014; WMO will support one expert from each RA III Member State; some trainees from Spanish speaking RA IV Members are also supported
- **Members requested to expedite the implementation and notify Secretariat on the attained level of compliance with the competency standards**
(to reply to WMO circular letter of 3 December 2013 and reminder of 25 March 2014)

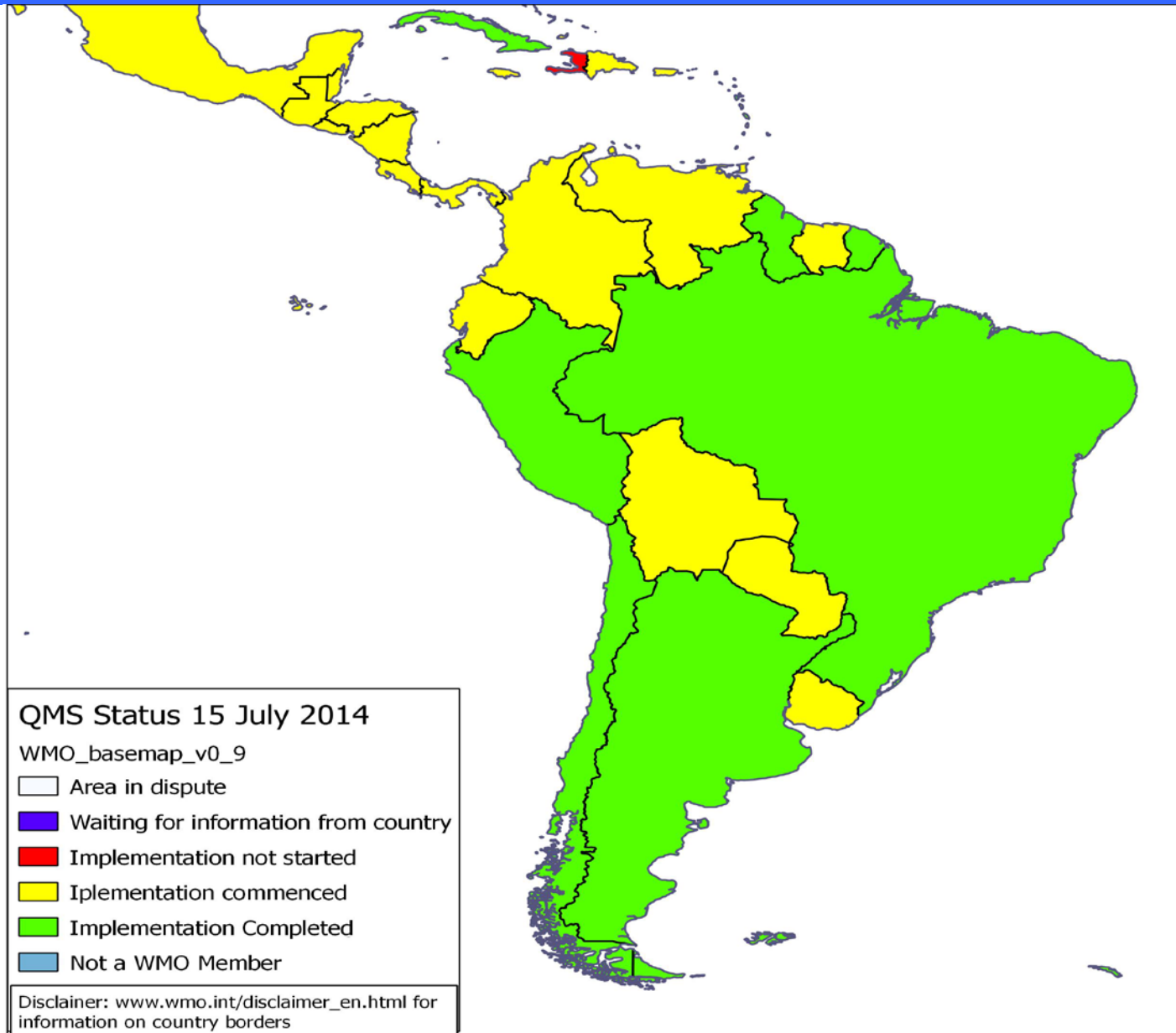
General: Qualification standards

1. Qualification requirements for aeronautical meteorological forecasters (AMF) included in WMO Technical Regulations, Vol I, Part II, Chapter 4, will become a **standard practice as of 1 Dec 2016**
2. Members will have to provide evidence of compliance with the qualification standards, i.e. the qualifications of the AMF are compliant with the Basic Instruction Package for Meteorologist (BIP-M)
3. Guidance on the implementation is provided in *WMO-No. 1083, Volume I*
4. **Members to initiate action on qualification assessment in order to meet the target date**
5. **Regional Training Centres (RTC) and relevant National Training Centres to offer training options based on an analysis of the Members' needs to fill the gaps in the AMF qualifications**

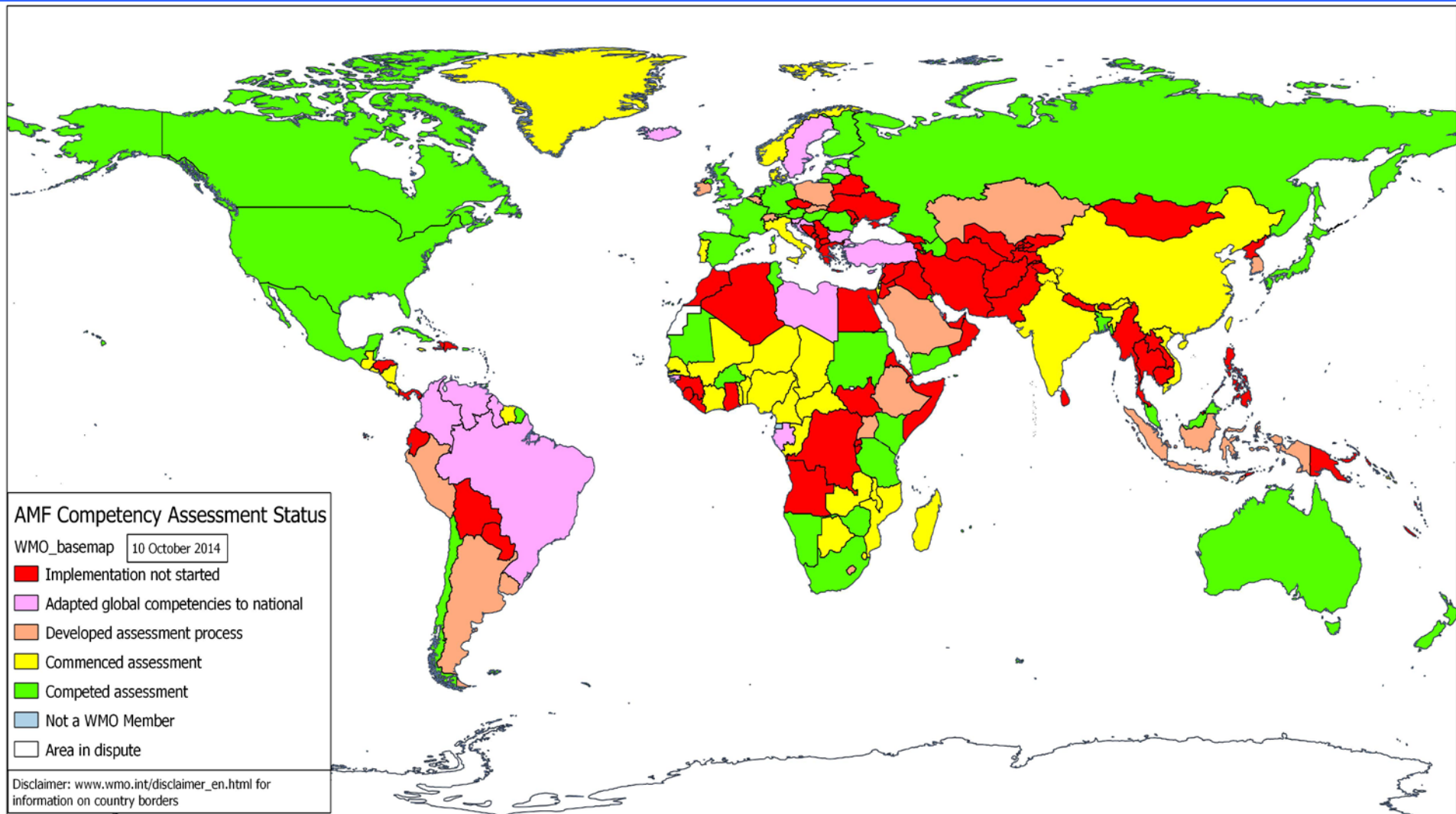
Global QMS Implementation status



QMS Implementation status RA III



Global CA Status Oct 2014



CA Status for RA III Oct 2014



Background and Necessary Documents

WMO No. 49, Technical Regulations

Vol I. General standards and recommended practices.

Vol II. Requirements concerning qualifications and training of meteorological personnel in aeronautical meteorology

WMO No 1083, Manual on the Implementation of Education and Training Standards in Meteorology and Hydrology Volume I – Meteorology

Background and Necessary Documents

ICAO Annex 3; Meteorological service for international air navigation Para 2.1.5

- **Top-level competencies will be mandatory to all Member countries**
- **Secondary level competencies are “guidance” and they are designed to clarify what is meant with the top-level ones = “Supportive role”**

Top level competences: Application conditions:

A. for the area and airspace of responsibility

B. in consideration of the impact of met phenomena and parameters on aviation operations, and

C. in compliance with aviation user requirements, international regulations, local procedures and priorities

Competence is described for each standard and Performance criteria given for each standard while recognizing Regional variations and Background

WMO No. 49: Top-level competencies for AMF broken into:

- 1. Analyze and monitor continuously the weather situation**
- 2. Forecast aeronautical meteorological phenomena and parameters**
- 3. Warn of hazardous phenomena**
- 4. Ensure the quality of meteorological information and services**
- 5. Communicate meteorological information to internal and external users**

THESE WILL BE MANDATORY!!!

1. Analyze and monitor continuously the weather situation

Performance criteria:

- Analyze and diagnose the weather situation as required in forecast and warning preparation.
- Monitor weather parameters and evolving significant weather phenomena (as defined in ICAO Annex 3) and validate current forecasts and warnings based on these parameters.
- Appraise the need for amendments to forecasts and updates of warnings against documented criteria and thresholds.

2. Forecast aeronautical meteorological phenomena and parameters

- **Performance criteria:**
- **Forecast the following weather phenomena and parameters: T, ρ , V, QNH, clouds, precipitation, fog or mist, other types of obscuration, hazardous weather phenomena listed in Performance criterion 3.1 etc**
- **Ensure that forecasts are prepared and issued in accordance with ICAO Annex 3, WMO-No.49, regional and national formats, codes and technical regulations on content, accuracy and timeliness.**
- **Ensure that forecasts of weather parameters and phenomena are consistent (spatially and temporally) across FIR, whilst maintaining met integrity. This will include monitoring fcsts issued for other regions, and liaison with adjacent FIR.**

3. Warn of hazardous phenomena

Performance criteria:

- Forecast the hazardous weather phenomena, including spatial extent, onset, duration, and intensity for e.g TS, FZRA, turbulence, low level wind shear, sand and dust storms, TCs...
- Ensure that warnings are prepared and issued in accordance with thresholds for hazardous weather, and with ICAO Annex 3, WMO-No.49, regional and national formats, codes and technical regulations on content, accuracy and timeliness
- Ensure that warnings of hazardous weather phenomena are consistent (spatially and temporally) across FIR, whilst maintaining meteorological integrity. This will include monitoring forecasts issued for other regions, and liaison with adjacent FIR

4. Ensure the quality of meteorological information and services

Performance criteria:

- Apply the organization's quality management system and procedures
- Assess the impact of known observational error characteristics (e.g. bias, achievable accuracy of observations and sensing methods) on forecasts and warnings
- Validate aeronautical meteorological data, products, forecasts and warnings (timeliness, completeness, accuracy), using real-time checks
- Monitor the functioning of operational systems and take remedial actions when necessary



5. Communicate meteorological information to internal and external users

Performance criteria:

- **Ensure that all forecasts/warnings are disseminated through the authorized communication means and channels to designated user groups**
- **Explain aeronautical meteorological data and information, deliver weather briefings and provide consultation to meet specific user needs**



Q: Who can certify that personnel are competent?

It is up to each aviation meteorological service provider, based on their national regulations and organizational procedures, to determine who can certify that personnel are competent. Experienced personnel should be selected and then trained to assess competence.

- **Q: What records must be kept to show that personnel have the required competencies and qualifications?**

NMHS must be able to demonstrate that competence Standards have been adapted to local and national circumstances and that all personnel satisfy the relevant requirements of the competence Standards. For AMF, have also successfully completed the requirements of the BIP-M in compliance with national/regional academic qualification requirements



Q: How frequently must competencies of personnel be tested?

The standards do not specify the frequency of assessment, it should be determined by review processes of the QMS and other factors such as staff recruitment, audits, changes in operating systems, products and services and by the results of earlier competence assessments (Typically 2 years)

- **Q; What will happen if an aviation meteorological service provider is unable to demonstrate by 1 Dec 2013 that their personnel are able to satisfy the competence Standards?**

A non-compliance issue should be raised against the associated ICAO requirement (i.e. ICAO Annex 3 Paragraph 2.1.5).



Possible steps of CA implementation

- 1. Customise the global CA toolkit to get a national one.**
- 2. Develop CA Implementation plan with budget lines, stations and dates**
- 3. Perform the assessments**
- 4. Re-train the “not yet competent staff” and re-assess them**
- 5. Issue certificates and Complete records on their personal files**



Conjoint ICAO/WMO meetings in July 2014

- The following meetings were held:
 - ❑ 7 – 8 July: CAeM Technical Conference (TECO) “Aviation Meteorology – Building Blocks for the Future”
 - ❑ 9-14, 17-18 July: Conjoint ICAO/WMO Meteorology Divisional Meeting <http://www.icao.int/meetings/METDIV14/Pages/default.aspx>
 - ❑ 15 – 16 July: 15th Session of CAeM <http://caem-15.wmo.int>
- Main topics discussed:
 - ❑ ICAO Global Air Navigation Plan (GANP) and the Aviation System Block Upgrades (ASBU) approach – how to plan and implement the meteorological components up to year 2028
 - ❑ Transition from “product-centric” to “data-centric” services through the System-Wide Information Management (SWIM)
 - ❑ Further regionalization of services (e.g., SIGMET) and related institutional and cost-recovery issues
 - ❑ Further development of a new “Space Weather” service
 - ❑ Roadmaps for the evolution of main services, such as WAFS and IAVW
 - ❑ Climate change impacts on aviation



Conjoint ICAO/WMO meetings in July 2014

- The decisions and recommendations of the Conjoint meeting will have significant impact on NMHSs and other MET service providers in the next decade and beyond
- It is recommended that a RA III subsidiary body should monitor all relevant activities of RA III Members and keep the Management Group of CAeM abreast of the developments
- Need to build better understanding of the forthcoming changes and their impacts on Members' MET authorities and service providers
- Following recommendations will have a bearing on the competencies of personnel serving IAN



Recommendation 2/4 Met information service provision to reflect GANP objectives

- Take into account recent developments in the exchange of meteorological information to support the needs of international air navigation, such as the use of the aeronautical fixed telecommunications network, the aeronautical fixed service satellite distribution system and the public Internet, and the code forms traditionally used for exchanging meteorological information
- Consider distribution systems and the development of new forms of data representation in the context of the integration of meteorological information in the future system-wide information management (SWIM) environment
- (Forecasters have to be conversant with all these)



Recommendation 2/4: Met information service provision to reflect GANP objectives

- The planned development of the evolution of aeronautical meteorology information exchange provisions in a foreseen end-state of this evolution by 2025. The established timeline includes gradual transition to XML/GML-based exchange format for METAR, SPECI, TREND, TAF and SIGMET to become a recommended practice as per ICAO Annex 3/WMO Technical Regulations, Volume II, in November 2016
- *The four blocks, with corresponding timelines of **2013, 2018, 2023 and 2028** respectively, consist of **capability modules defining solutions***
- *So, there are intended performance improvements, and these are embellished by descriptions of the anticipated technology and/or procedures (both air and ground), the business cases, the regulatory approval plans and the transition strategies.*
- *The beginning of each block refers to the availability of all components of its particular performance improvement and the end of each block refers to the target implementation deadline.*
- *One size may not fit all, so ICAO is working with States, in particular through regional planning groups, to help determine which capabilities should be implemented based on the operational requirement.*



Recommendation 2/9: Regional advisory system for select en route hazardous meteorological conditions

- **RHWAC** - Regional Hazardous Wx Advisory Centre (Please read Appendix E to the Report on Agenda Item 2)
- The acute lack of capacity of some States to meet many Annex 3 responsibilities regarding SIGMET issuance was emphasized during a SIGMET trial conducted by the METWSG in April to July 2011. This trial was aimed at testing the feasibility of regional SIGMET advisory centers (RSAC) assisting MWOs to issue SIGMETs by providing them with SIGMET advisory information.
- ICAO expert group to develop the RHWAC scheme by
 - (a) the development and implementation of permanent governance arrangements by mid-2015; and
 - (b) the development and implementation of appropriate funding systems by mid- 2015.
- **NOTE: 1. China and Russia gave a statement against the notion of having only two WAFCs**
- **2. Bahrain, Kuwait, Qatar and United Arab Emirates gave a statement against the development of a RHWAC in their region**



Recommendation 4/3 — Oversight of aeronautical meteorological service provision

- That personnel performing safety oversight functions of the aeronautical meteorological service are adequately qualified and competent meeting the requirements of Annex 19 — Safety Management;
- Emphasis is on the need for a State to ensure
- that the personnel performing safety oversight functions of the aeronautical meteorological service are adequately qualified as required by Annex 19



Recommendation 4/5 — Evolving competency of aeronautical meteorological personnel

- Ensure that aeronautical meteorological personnel can, through the implementation of a competency framework based on quality management system principles and supported by relevant training material, adapt to new working practices arising from the realization of the “One Sky” concept for international air navigation.
- Includes transition to automated production and delivery processes aligned with advances in technology (including digital information exchange) and a more prominent role in collaborative decision-making (CDM) among aviation stakeholders (service providers and users)



Recommendation 4/6 — English language proficiency of aeronautical meteorological personnel

- WMO/ICAO consider the development of provisions concerning the required level of English language proficiency of aeronautical meteorological personnel to be applied at the discretion of the State.
- The development of such provisions would be intended to mitigate the risk of misunderstandings between the aeronautical meteorological service provider and the user that may impact the level of weather-related situational awareness and flight safety, as well as promote inter-State coordination, as needed.
- However, this would involve a relatively small number of personnel and that in many States face-to-face briefing would tend to be replaced by more automated methods!



The Way forward

1. One size may not fit all, so ICAO is working with States, in particular through regional planning groups, to help determine which capabilities should be implemented based on the operational requirement of each State.
2. Each State should take part in the organization of a Regional Conference on the Future of Meteorological Service Provision to Civil Aviation, to explore coordinated regional approaches in RAIII in response to the evolving ATM system.
3. Evolving requirements will touch many areas of our operational work and the competency of the personnel providing it. To remain relevant, it is important that we remain vigilant and responsive.
4. Regionalization of the service provision, including cost-recovery is the way to go. We should further explore how our services fit into this!
5. Cost recovery could assist Members in meeting evolving requirements including QMS and CA.



Link to report of the Divisional meeting 2014

- It is very important for you to read the reports, as individuals or as a group! The future of aviation meteorology, to a good extent, lies in the deliberations of that meeting.

- The link to ICAO MET Divisional Meeting report is:

<http://www.icao.int/Meetings/METDIV14/Pages/YellowCoverReport.aspx>

- *Heads of NMHS should form a small team to study and customise the recommendations and develop GANP and ASBU country plans*





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Thank you for your attention

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