**Submission by CAeM – Expert Team on Education, Training and Competency**

**BIP-M Survey Questions for Technical Commissions (25 October 2018)**

The Basic Instructional Packages for Meteorologists and Meteorological Technicians (BIP-M and BIP-MT), published in 2013 and included in WMO-1083, recommend the appropriate educational background to become a meteorologist and meteorologist technician. This background can be used for personnel in many government and private sector jobs. The BIP-M is currently an international standard required by all Aeronautical Meteorological Forecasters and it has been proposed by EC-70 as a future standard for Marine Meteorological Forecasters as well. For other service areas, the BIP-M or MT is currently a recommended qualification.

EC-70 requested that a review of the BIP-M and MT be conducted to ensure they meet new professional requirements. Your input would be valuable to guide this review and revision.

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a. Have meteorologists working in your area of specialization typically completed the BIP-M or MT? Approximately what percentage of Members require completion of the BIP-M? What percentage require completion of the BIP-MT?

Yes reference CAeM Global Survey

**Q5.5: What is the readiness in your State/Territory to comply with the WMO**

**qualification standard for aeronautical meteorological forecasters to become**

**applicable on 1 December 2016?**

If the expected compliance level is below 25%, please provide a brief explanation, together with an indication of the expected date when the qualification requirement would be fully met?

Close to 40% of Members indicate that there AMSPs are fully compliant with the WMO qualification standard for aeronautical meteorological forecasters (AMF), see Figure 40. Forty percent of Members indicated that 50% till 99% of their AMFs are compliant, for 12% of Members less than half of their AMF comply, and the status is unknown for 10% of Members.

b. Has your commission completed development of a competency framework or supplement to the BIP-M or BIP-MT? Are there plans to develop one?

**Yes – The Competency Standards for AMF -**

[**http://www.caem.wmo.int/moodle/pluginfile.php/401/mod\_resource/content/3/Implementation%20Guidance%20of%20AMF%20Competency%20Standards\_v1\_6\_.pdf**](http://www.caem.wmo.int/moodle/pluginfile.php/401/mod_resource/content/3/Implementation%20Guidance%20of%20AMF%20Competency%20Standards_v1_6_.pdf)

**The Competency Standards for AMO**

[**http://www.caem.wmo.int/moodle/pluginfile.php/442/mod\_resource/content/2/Implementation%20Guidance%20of%20AMO%20Competency%20Standards\_V1\_5\_.pdf**](http://www.caem.wmo.int/moodle/pluginfile.php/442/mod_resource/content/2/Implementation%20Guidance%20of%20AMO%20Competency%20Standards_V1_5_.pdf)

c. We are interested in what you think of the BIP-M and BIP-MT since both are being reviewed at the direction of the EC. Please review possible changes below and check those that you believe should be considered during the review (ignore any that you do not consider necessary):

* ***BIP-M***
* Potential to focus on particular service areas (aviation, marine, public weather, etc.) by addressing required job competencies
* Suggest regional differences to the qualifications
* Reduce some math and physics requirements
* Include more than one class or level of qualification
* Offer **an** assessment tool that could be used to demonstrate expected learning outcomes
* Include content areas that represent new and emerging service delivery requirements (communications, impacts forecasting, DRR consultation, basic climate services, etc.)
* No changes are required
* Other:
* **BIP-MT**
* Address new requirements for Automated Weather Station maintenance
* Add requirements in the area of information technology and data processing
* Reduce content on manual observations
* Update to more directly include WIGOS requirements
* Increase content on interpretation of remote sensing products
* Include more than one class or level of qualification
* Offer an assessment tool that could be used to demonstrate expected learning outcomes
* No changes are required
* Other:

**Comments**

*Under BIP-M*

 The first two options may ensure MET Services will train forecasters specific to Aviation (or Marine) to minimise staff shortages (in the case where there is shortages).

       The use of an assessment tool or the concept of using assessment as a means to demonstrate learning outcomes may be useful, for example forecasters who have not worked in aviation but want to move to aviation will now have an official means to do so.

Suggestions for assessment tools is extremely important mainly taking into account that the learning levels are not defined in 1083 according to Bloom taxonomy. Another need of development in 1083 might be necessary in terms of KUSA.

In addition to what Andrea Henderson wrote on including communication I would like to add the following:

Active listening skill is essential to improve communication since each user is an individual and consequently has an individual level of understanding of weather as a result active listening skill need to be practiced to ensure that your response to the user meet his/her needs.

Perhaps Basic computer skills should be considered, to assist the meteorologist with the first line of computer related challenges during while carrying out their duties. E.g they should be creative enough to write their own macros.

It would be more effective to have different annexes for different branches of meteorology. Using this approach, it will be easier to follow, implement and focus. It should be remembered that operational meteorologists are less involved in some areas of science and the need of some topics might be less important in professional development.

Differences in qualifications are inherent, taking into account the educational approaches for each state. Some follow-ups in training might not be considered by NSA mainly because a lot of the training centers are not accredited as university level structures, even if the information is at the required level.

Regarding the reduction of mathematics and physics requirements, is not relevant at operational level unless the aviation forecaster wants to divert to research and dependent on the required competencies. Maths and science is the back bone of forecasting and understanding how the models work.

***Under BIP-MT***

The concept that not all MET Technicians are observers – some of the staff that delivers only MET Briefing for aviation is not dealing with observation at all! I know at least 3 organizations in Europe with this structure: Forecasters, Observers and MET Information staff. Maybe a slight change in the general approach might be necessary, taking into account that the MET Info staff has to be qualified and, also, to have deep knowledge and understanding of the meteorological phenomena and conditions.

Not related to the questionnaire but in the 'BIP Pathways' presentation a university degree-level is proposed for MET Technicians. The degree for MET technicians may be over qualification.

Core Meteorology may be addressed by in-house WMP training and Technical level Qualifications through advanced courses.

The new requirements for AWS (infrastructure) maintenance may be addressed by in-house WMP training as suggested above and the use of an assessment tool or concept of using assessment such as AMO competencies as a means to demonstrate learning outcomes. The same may be applied to increase content on interpretation of remote sensing products.

The need to offer an assessment tool that could be used to demonstrate expected learning outcomes cannot be overemphasized.

 From Gabo and Kathy-Ann