

WORLD METEOROLOGICAL ORGANIZATION

COMMISSION FOR AERONAUTICAL METEOROLOGY

Joint Meeting of ET-ETC and ET-GOV

Wellington, New Zealand

30 November – 3 December 2015

FINAL REPORT



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PICTURE



1. OPENING OF THE MEETING

1.1 The meeting was opened at 10:00 on Monday, 30 November 2015. Mr Peter Lennox, Chief Executive of MetService, New Zealand, welcomed the participants and expressed his satisfaction of the opportunity to host the meeting of the two Expert Teams of the CAeM. Mr Chris Webster and Mr James Lunny presented the working arrangements for the meeting. Mr Dimitar Ivanov, C/AEM, addressed the meeting on behalf of the WMO Secretariat and stressed on the importance of this meeting for progressing the tasks of the CAeM. The participation of invited experts forming the AG/1 of the ICAO MET Panel was an excellent opportunity for coordination and alignment of tasks and achieve better efficiency. Mr Ian Lisk, VP/CAeM, also welcomed the participants on behalf of P/CAeM.

1.2 The meeting was attended by 10 core members of ET-ETC and ET-GOV, 6 invited experts, from 6 Member States and one expert (Mr Dennis Hart) from EUROCONTROL. Mr Peter Lechner, Chair of the ICAO MET Panel was attending in a dual role as a core member of ET-GOV and as the Chair of ICAO MET Panel and its Ad-hoc Group on MET Cost Recovery Guidance and Governance (AG/1- MCRGG). Mr Chris Webster chaired ET-ETC and Mr Jan Sondij chaired the ET-GOV sessions. The secretarial support was provided by Mr Dimitar Ivanov (C/AEM) and Mr Jeff Wilson (D/ETR); they were assisted by Mr Ian Lisk and Ms Brigitte Vuitteney-Gelman (from her office in Geneva). The list of participants is in Annex 2.

1.3 The meeting adopted its Agenda as shown in Annex 1. The meeting was conducted as joint and separate sessions of the ETs as necessary for adequate covering of different agenda items.

2. REVIEW OUTCOMES AND DIRECTIONS BY RELEVANT WMO AND ICAO BODIES

2.1 ICAO METP/1 and subsequent developments

2.1.1 D. Ivanov presented briefly information on the establishment by the ICAO ANC of the ICAO Meteorology Panel (METP) and its structure, tasks and working arrangements ([Doc. 2.1](#)). It was beneficial for the meeting of ET/GOV and ET-ETC that a number of MET Panel members were in attendance, including the METP Chair, Peter Lechner. The meeting noted that the METP main objective was the follow-up on the MET DIV 2014 recommendations for the future development of the meteorological service for aviation in line with the ICAO GANP and ASBU, throughout the ASBU Blocks. The METP with its working groups and other subsidiary bodies completely replaced the previous ICAO structure of MET bodies and the outstanding legacy tasks have been assigned to relevant new groups.

2.1.2 METP work is based on Job Cards (tasks) approved by the ICAO ANC. The Job Cards are based on the recommendations of the MET DIV 2014 and the responsibility for each job card is assigned to one or more of the four METP working groups or another appropriate ICAO body.

2.1.3 The meeting was informed about the recent meetings of the METP working groups and the advancement of the priority tasks mainly related to preparation of material for Amendment 78 of Annex 3 and related guidance material. In view of the new update cycle of Annex 3 amendments adopted by ICAO, a number of tasks were to be completed by October 2016, the time of the planned second meeting of the METP, in order to fit to the amendment work flow that includes the circulation of the draft amendment for consultation with the States in December 2016.

2.1.4 To ensure consistency of the planning cycles and deliverables of its subsidiary bodies, the METP also established a standardized MET Panel Requirements Development Process. The meeting noted the important role played by ICAO in this process with inputs and contributions from relevant WMO bodies, such as CAeM and its ETs.

2.2 CAeM MG/2015

2.2.1 D. Ivanov briefed the meeting about the outcomes of the 2015 meeting of the Management Group of the CAeM (MG/2015) which was held from 12 to 14 May 2015 in Cape Town, South Africa ([Doc. 2.2](#)). The main objective of the meeting was to review the work programmes of all Expert Teams and align them with the priorities of the Commission for the current intersession period 2015 – 2018 (and the WMO financial period 2016 – 2019). All documents and the report of the meeting are available on the WMO AeMP website at: <https://www.wmo.int/aemp/node/63>.

2.2.2 The meeting noted the revised terms of reference (TOR) of ET-GOV and ET-ETC, as agreed by MG/2015, which should be considered in the updating of their respective work programmes.

2.2.3 The meeting reviewed the list of action items agreed by MG/2015 and noted those items for which the follow up action is assigned to ET-GOV or ET-ETC, as follows:

No.	A.I.	Action	Responsibility	Deliverable	Target date	Status
2.	4.1.1	Conduct global survey on institutional arrangements for the provision of MET Service for aviation, including business models and cost-recovery aspects.	ET-GOV	Survey	End of 2016	
3.	4.1.1	Revive WMO-No. 732, Guide to Practices for Meteorological Offices Serving Aviation. WMO-No. 732 should be fully updated and become a placeholder for the new guidance material; the starting point should be developing a new outline of the document.	ET-GOV Secretariat	Outline of updated WMO-No. 732	ET-GOV meeting, Nov 2015	On-going
4.	4.1.5	Transforming the WMO-No. 1083, Manual on the Implementation of Education and Training Standards in Meteorology and Hydrology, Volume I, into a Guide on compliance with both qualification and competency requirements. Coordinate with Secretariat how this work would be organized and should contribute the chapters related to the AMP.	ET-ETC Secretariat	Proposed outline of the Guide; Inputs on C&Q for AMP	ET-ETC meeting, Nov 2015	On-going
6.	4.2	All ETs should review and update their work programmes and submit to Secretariat for posting on the website	ET Chairs, Co-Chairs	Updated final work programmes	Sep 2015	On-going
7.	6	Prepare CAeM Operating Plan 2016-2019 as a compilation of the work programmes of the Expert Teams with appropriate grouping of the tasks according to the KOs.	ET-GOV to coordinate	Draft CAeM OP 2016-2019	ET-GOV meeting, Nov 2015	On-going

2.2.4 With regard to the action 4.1.5 above, the meeting noted that the current plan for Doc. 1083 was to be converted to a Guide on Education and Training, while the competency relevant guidance material would be included in a new Guide on competencies.

2.3 WMO 17th Congress

2.3.1 D. Ivanov presented the main outcomes of the seventeenth session of the World Meteorological Congress (Cg-17) which was held from 25 May to 12 June 2015 in Geneva ([Doc. 2.3](#)). The Cg-17 Abridged final report with resolutions is published on: http://library.wmo.int/pmb_ged/wmo_1157_en.pdf.

2.3.2 The meeting noted the Cg-17 resolutions of relevance for the CAeM, including ET-ETC and ET-GOV, as follows:

- **Resolution 3 (Cg-17)**, *Aeronautical Meteorology Programme*;
- **Resolution 66 (Cg-17)**, *WMO Support to Evolving Aeronautical Meteorological Services*;
- **Resolution 8 (Cg-17)**, *Amendment of Competency and Qualification Provisions in the Technical Regulations (WMO-No. 49), Volume I*;
- **Resolution 7 (Cg-17)**, *WMO Quality Management Framework*;
- **Resolution 38 (Cg-17)**, *Four-year Plan for WMO Coordination of Space Weather Activities*, calling for specific action by CAeM.

2.3.3 The meeting was further informed that Cg-17 approved the WMO Strategic Plan 2016 – 2019 (**Resolution 69 (Cg-17)**) in which aviation meteorological service is recognized as one of the seven strategic priority areas, i.e.,: 1. Disaster Risk Reduction (DRR); 2. Global Framework for Climate Services (GFCS); 3. WMO Integrated Global Observing System (WIGOS); 4. Aviation meteorological services; 5. Polar and high mountains regions; 6. Capacity Development; and, 7. Governance. The meeting agreed that ET-ETC and ET-GOV will have a major role in the follow-up of the Congress decision for prioritizing the aeronautical meteorology, which should be properly reflected in their respective work programmes. **[Action 1]** (Note: Action List is attached as Annex 6.)

3. REVIEW AND UPDATE OF ET WORK PLANS

3.1 Under this agenda item, the meeting reviewed the ICAO METP job cards in order to identify their relevance for ET-GOV and ET-ETC and ensure proper mapping in the corresponding work programmes. Mr P. Lechner introduced the job cards and provided details on the respective tasks of the METP bodies.

JC	Title	ET-GOV	ET-ETC	Note
1	AMHS tests	-	-	
2	MET modules for ASBU Block 2 and ASBU Block 1 (MSTA)	-	-	Administrative task for the METP
3	Aeronautical MET information to support ATM gate-to-gate	+	+	Concrete tasks would be developed based on the Concept for MET information for TBO and the “white paper”
4	Further development of IAVW	+	+	To be considered in the updating of Doc 732
5	SWIM	++	+	ET-GOV – governance aspects; ET-ETC – training and competency aspects
6	Reorganization of provisions (Restructuring Annex 3, PANS-MET)	+	+	WMO Secretariat and CAeM will be strongly involved; concrete tasks for ET-GOV and ET-ETC would be defined at a later stage
7	Provisions for RRM	-	+	WMO engagement is through ET-ERA of CBS; training aspects to be addressed by ET-ETC

8	Implementation of RHWAC	++	+	ET-GOV to contribute to governance aspects, including cost-recovery; ET-ETC role on training and competency at a later stage
9	SADIS	+	+	ET-GOV to look at SADIS cost-recovery as a possible model; ET-GOV to check existing guidance material and reflect the changes in the SADIS
10	Space Weather	+	+	WMO engagement is mainly through ICTSW; ET-GOV to follow on governance aspects; ET-ETC to consider needs for training and competency; More concrete tasks to be defined following the METP progress
11	Further development of WAFS	-	+	ET-ETC to consider future need for training and guidance material following the planned evolution of the WAFS, including the engagement of new methodologies, such as ensemble forecasting and probabilities
12	Governance and cost-recovery	++	+	ET-GOV to follow closely with METP AG/1; ET-ETC to contribute in developing of guidance material

3.2 With regard to Job Card 6 on the reorganization of Annex 3, the meeting discussed the impacts on the WMO Technical Regulations, Volume II. It was realized that WMO currently had no analogue of the ICAO PANS-MET, thus it would be questionable where such material would be published by WMO (if at all necessary). It was mentioned that for some Members (e.g., in SW Pacific) in the past, the access to ICAO documents was difficult, therefore, they relied on the WMO publications. The meeting agreed that the concept of maintaining two analogous documents by ICAO and WMO should be discussed in line with the review of the working arrangements between WMO and ICAO. **[Action 2]**

4. COORDINATION AMONG EXPERT TEAMS

4.1 Jan Sondij presented the Work Programme of ET-GOV which was updated after the CAeM MG/1 meeting. The following issues were discussed:

4.1.1 The monitoring of QMS implementation should continue with collecting information from the Member States in order to keep the geographic representation of the status of implementation for the EC. This task should be coordinated with ET-CCP and Secretariat. Question about QMS implementation should be included in the Survey.

4.1.2 Need to coordinate with the ET-ETC the development of guidance on the competency of MET oversight staff of Members.

4.1.3 The development of improved guidance on the Members' arrangements for MET Authority, MET service provider and MET oversight should be regarded in connection with the tasks for the restructuring of Annex 3 and the review of the working arrangements between ICAO and WMO.

4.1.4 MG/1 assigned the responsibility of the review and update of the WMO-No. 732 to ET-GOV. The task should be well coordinated with ET-ETC. The first step is to agree on a new outline. There is a possibility of hiring a consultant to assist with the drafting.

4.1.5 ET-GOV should contribute in the work on the restructuring of Annex 3. It is important to clarify the impact on the WMO Technical Regulations Vol II. There is also a need to analyse the impact on all related documents containing guidance material both by ICAO and WMO. There may be some opportunities to optimize the handling of the documents, e.g., some joint publications (e.g., the ICAO Doc 8896 and WMO-No. 732).

4.1.6 ET-GOV needs to consider some special demands by Members and Regional Associations, such as the provision of guidance on the cost-recovery for the SIDS.

4.2 Chris Webster presented the current version of the ET-ETC work programme updated after the MG/1 meeting. The meeting discussed the following issues:

4.2.1 It is necessary to clarify the situation with the co-chair of ET-ETC – request NWS to advise about replacement of Pat Murphy due to his relocation from NWS to FAA.
[Action 3]

4.2.2 The linkage with the EC Panel on ETR should continue be maintained; currently Chris is the link between ET-ETC and the ETR Panel.

4.2.3 The ET-ETC tasks are well defined and there is already some progress, e.g., the development and circulation to Members of initial guidance on the compliance with the qualification requirement for AMF which will become a standard from 1 December 2016. Question was raised on the validation and recognition of the AMF qualification status by different Member States. In this regard, it is desirable to develop further guidance detailing the roles and responsibilities of the AMSPs, educational institutions and national regulators.

4.2.4 The need for the compilation of the existing guidance developed by ET-ETC as online material into a Chapter of the future WMO Guide on Competency should be prioritized with the aim to complete this task in 2016.

4.2.5 The status of the existing internet resources (the Moodle website and the HKO online database); ET-ETC was requested to consider measures for consolidation and ensuring sustainability of these resources.

4.2.6 ET-ETC should also consider the training needs of Members (expressed through the Regional Associations) for training on the implementation of competency and qualification requirements. It was acknowledged that ET-ETC has been instrumental in executing a vast competency assessment training programme covering all WMO regions. Now it is necessary to consider a second phase with focus on individual Members or sub-regions where CA implementation is lagging behind.

4.2.7 Based on the above discussions, ET-ETC and ET-GOV considered further refinement of their WPs and reported back under agenda item 6.

5. EXPECTED KEY DELIVERABLES

5.1 ET-ETC

ET-ETC task 2.1.1: Second level competencies for Aeronautical Meteorological Personnel

5.1.1 The ET-ETC reviewed the document by Andrea Henderson ([Doc. 5.1\(1\)](#)) regarding the AMP second level competencies and related guidance material. The material was derived from that on the Moodle website and used within the AMP competency development workshops during the last financial period. The ET-ETC concluded that the material was almost ready for publication (including a slight update on the language performance criteria discussed below) but were uncertain about where it should be published: either in a CAeM-specific Guide (such as WMO-No.

732) or in a more broad publication such as that proposed by the EC Panel of Experts on Education and Training (see next section).

5.1.2 The ET-ETC requested D/ETR to circulate the appendix to Andrea's document to the RTCs and the ETR Focal Points for information prior to decisions regarding where to formally publish the material. The existing text is attached as Annex 3 to this report. **[Action 4]**

5.1.3 The ET-ETC agreed with the following replacement text related to the footnote in the performance criteria C5.2 regarding English language proficiency: *'In accordance with any language proficiency requirements stipulated by the national regulator.'* **[Action 5]**

5.1.4 To assist Members reconcile the content of 'ab initio' training courses with the knowledge components of the AMF competencies and the Basic Instruction Package for Meteorologists, it was suggested that examples of some of the mapping exercises that various training institutes (such as CIMH) have undertaken be provided on the Moodle website. The ET-ETC further decided that it would be worthwhile using a tool (such as SurveyMonkey) to request information from the Members' training institutes on what assistance and guidance they would like to see from the team. **[Action 6]**

5.1.5 The ET-ETC noted the resources that were compiled for the resource mapping exercise and hosted by Hong Kong Observatory (HKO). The ET-ETC requested Chris Webster to check with "Queenie" Lam for details of the usage of the HKO mapping website in terms of numbers, who are using (which countries from IP numbers in server logs) and what are they looking at. Information about the backup options for the site should also be of interest. The ET-ETC discussed how often the material on the site should be reviewed for accuracy. A decision regarding review frequency would be made once site usage was known. **[Action 7]**

WMO Guide on Competency Management

5.1.6 The EC ETR Panel have indicated that they will develop a "Guide on Competency Management" (title has been fluid up until this meeting). It was originally envisaged that this would also include second-level competency information from each of the different service areas. But during discussions at the recent "Writing Technical Regulations" workshop held in Geneva, it became apparent that a number of Technical Departments/Commissions suggested that their second level competency information should be included in their subject-oriented guides. On balance, the ET-ETC also agreed with this, particularly given the proposal to update WMO-No. 732. The ET-ETC agreed to review and contribute content (through Andrea) to the ETR Office for the wider Competency Management Guide. The first draft end of January from the ET-ETC. WMO-No.732 would reference WMO Guide on Competency for generic 'how' to assess. **[Action 8]**

5.1.7 Paul Bugeac presented a document on "Competence Management Systems as part of an overarching QMS" ([Doc. 5.1\(3\)](#)). The ET agreed for this material to be posted on the Moodle website as generic guidance information (including a shorter executive summary to be added by Paul). The final draft, to be circulated by Paul to ET-ETC members by the end of the year, should also be coordinated with the ET-GOV. The ET-ETC encouraged the Secretariat (ETR Office) to consider some of the content and ideas in this document when developing the wider competency management guide. The ET-ETC thanked Paul for his offer to update his material based upon discussions and feedback during the session. **[Action 9]**

5.1.8 The ET-ETC noted the similarity of a number of competency frameworks for forecasters in different service areas which were presented to Cg-17 (e.g., marine, PWS, WIS). The group considered the possibility of consolidating, over the next four years, the generic forecaster competency requirements across each of the competency frameworks for eventual inclusion in Vol. 1 of WMO-No. 49. The second level and service specific competency material could then be included in the service domain guides such as WMO-No. 732 for aviation. The ET-ETC suggested that Chris Webster should raise this at the March 2016 session of the EC Panel of Experts on

Education and Training for consideration in the Panel's work plan with possible target for submission to Cg-18 in 2019. **[Action 10]**

CAeM Publications

5.1.9 The ET-ETC reviewed the list of WMO AeM-related publication as presented in [Doc. 4.1](#).

5.1.10 The group recommended the withdrawal of WMO-No. 770 (NWP) as the NWP field was rapidly changing and it was impossible to keep up-to-date using the WMO publication process and the cost of production were prohibitive.

5.1.11 The ET-ETC noted that many of the CAeM publications had been produced prior to the widespread use of the internet and that the internet now provided many more ways to make this non-regulatory material available. The ET-ETC recalled that organizations like COMET, ECMWF and NCEP also provided online training modules and publications reducing the need for specific publications such as WMO-No. 770. The ET-ETC did note that the majority of the NWP related material available on the internet was in English only, or for the COMET modules English and Spanish, and this caused problems for personnel who did not speak English.

5.1.12 The ET-ETC needed further clarification from the Secretariat regarding their possible role in reviewing WMO-No. 8 (CIMO Guide), WMO-No. 731 and WMO-No. 1390 (old ETR publication Hazards). Regarding WMO-No. 1390, the ET-ETC noted that some of the useful material had been mapped to HKO website resource and thus if WMO-No. 1390 was removed, this mapping would need to be updated. The ET also noted that some of the WMO-No. 1390 material needed to be updated.

5.1.13 The overall recommendation from the ET-ETC was that WMO-No. 732 needs to become the overarching aviation services guide and to include competency guidance.

5.1.14 During a more general discussion on publications, the ET-ETC recommended that, as part of the planning and creation of any new or revised publication, review dates are set with the documents withdrawn unless the review shows they need to be kept or updated. The ET also recommended that the VP of CAeM should request the participants in the Presidents of Technical Commission meeting in January 2016 to include a work task in their various teams to review all of their publications to identify further aviation references and dependencies. **[Action 11]**

5.1.15 The ET-ETC further noted that ICAO Annex 3, para 2.1.5 and Annex 1, para 4.8, references WMO-No. 258 and that they should be updated to include 'competency' reference. **[Action 12]**

CAeM Moodle website

5.1.16 The ET-ETC recalled that much of their material was made available to Members via the CAeM Moodle website. During discussion on the website and possible actions, the team identified the following for the Moodle team to address:

- http://www.caem.wmo.int/index_bak.html needs to be taken down
- <http://www.caem.wmo.int/moodle> functionality needs to be reviewed and updated to split static and interactive content and to investigate whether guidance material can be accessed without having to log-in. **[Action 13]**

MET Inspectorate role

5.1.17 The ET recalled the discussion from the joint sitting regarding qualifications and competencies for personnel in the MET Inspectorate role. Whilst recognizing that ICAO (not WMO) had authority in this area, the ET recommended that WMO should have input into the setting and

review of any qualification and competency requirements. The ET agreed to assist the ET-GOV ensure relevant guidance material is adequately captured.

Task 3.1.1 Helping Members demonstrate BIP-M compliance for their staff by 1 December 2016

5.1.18 The ET reviewed the work led by Jannie Stander and Chris Webster prior to the session including the development of a flow chart as a tool for assessing compliance ([Doc. 5.1\(2\)](#)). Positive feedback was provided by some Members to the flow chart and examples of BIP-M compliance from the University of Pretoria and University of Dar Es Salaam. The ET noted that the flow chart had already been translated into Arabic, French, Russian and Spanish and made available on the Moodle website and via the RTCs and ETR Focal Points networks.

5.1.19 ET-ETC recommended that Members be reminded of the 1 December 2016 deadline and provided updated flow charts taking into account the adjustments at the meeting re. MET Authority, Regulator and Aviation Meteorological Service Provider. D/ETR agreed to work with Dimitar to draft a circular letter for the SG to send to all Members reminding them of the 1 December 2016 deadline, providing the updated flow chart and the revised FAQs. **[Action 14]**

5.1.20 D/ETR updated the ET on the anticipated compliance level for 1 December 2016 for the BIP-M based upon September 2014 data. D/ETR will seek updated information from Members and advise the ET and ET-CCP when that has been collected. The ET noted that it would be ideal if this data was available via the WMO Country Profile DataBase (CPDB). The ET further noted that many of the gaps in data coincided with Members where the AMSP was not the NMHS. The ET discussed whether it was necessary for data to be collected or obtained in these cases and recommended that it was to be in agreement with WMO Strategic Plan 2016-2019.

5.1.21 Noting the update to the flow chart to take into account the role of the regulator, it was necessary to update the FAQs for the BIP-M compliance. The changes included a new question / answer related to 'Has your regulator signed-off on your process?' and removal of all references to PR. See also revised FAQ2 below:

'2. What will be the role of Permanent Representatives in setting academic qualifications?

The Aeronautical Meteorological Forecaster (AMF) academic qualification requirement is the successful completion of the relevant parts of the Basic Instruction Package for Meteorologists (BIP-M) as informed by consideration of the area and airspace of responsibility, the impact of meteorological phenomena and parameters on aviation operations, and compliance with aviation user requirements, international regulations, local procedures and priorities. It is the responsibility of each Aviation Meteorological Service Provider (AMSP) to consult with the national Meteorological Authority (MET Authority), national aviation Regulator (in many countries the regulator also performs the Meteorological Authority role) and where appropriate other regional bodies to agree and assure that this requirement is being met. Some AMSP may decide, at the organisational level, to set a higher qualification level or a MET Authority may decide to impose a similarly higher qualification level. Only in instances where a WMO Meteorologist classification requirement is set or imposed should the relevant WMO Permanent Representative(s) also be consulted.'

8. What steps should be taken now to ensure that personnel providing meteorological services for international air navigation have the required qualifications and competencies?

"By 1 December 2016, AMSP, taking into consideration the area and airspace of responsibility, the impact of meteorological phenomena and parameters on aviation operations, aviation user requirements, international regulations, local procedures and priorities, shall ensure that their Aeronautical Meteorological Forecasters have successfully completed the BIP-M, as defined in Appendix D of WMO Technical Regulations Vol 1 (WMO-No. 49).

*Note that the deadline for AMSP to implement competency Standards for AMP passed in 2013. Guidance material will continue to be available on the CAeM Education and Training website at <http://www.caem.wmo.int/moodle/>." **[Action 15]***

Task 2.1.2 - How to deal with requests for AMF documents and assistance

5.1.22 ET-ETC discussed options for providing support to ad-hoc enquiries based on best use of available resources to include the assigning of the ETC Forum Triage. Kathy-Ann agreed to take the lead in these responses. The ET-ETC suggested aiming to respond to questions within a week. If things take longer, then look to escalate these to the Secretariat (Dimitar and Jeff) for action on how to deal with them. For very involved or detailed questions, it may be necessary to suggest the use of a "consultant". **[Action 16]**

5.1.23 A 4-yearly website review process to be proposed and introduced by Raf for consideration by the CAeM Management Group.

Aviation XML

5.1.24 The ET-ETC discussed [Doc. 5.1\(5\)](#), *Exchanging meteorological aeronautical information in XML: consideration of knowledge required*, submitted by Steve Foreman C/DRMM, WMO Secretariat. The document identified four different roles associated with the implementation of XML with specific needs for training, as follows:

- Managers – need to be aware of the upcoming changes to promote that the AMSP prepares for the implementation of Aviation XML. ET-ETC recommended that ET-CCP include this topic in their tasks;
- Developer – this group needs to adapt existing display and decision aid software to accommodate the new coding procedures. Whilst the XML is industry standard, the ET-ETC noted that there may be a requirement for the AMSP to ensure that the developers were aware of the content elements and their likely and unlikely physical values and characteristics. The ET-ETC recommended that this education task be undertaken by the AMSP;
- IT communications teams – similar requirements to the developers and also to be undertaken by the AMSP;
- End Users – this includes meteorological staff and airline staff (flight crews, dispatchers). Decision or recommendation regarding training requirements were put on hold until further information regarding the types and characteristics of data and products to be included in Aviation XML become more widely known.

5.1.25 The ET-ETC noted that it was not easy to find and navigate to material on the WIS Wiki site (the team searched for the latest information on AvXML and were unable to locate it). Additionally the team found the site was slow and in some instances just led to blank screens (*Post meeting note. It appears that the blank screen indicates that you need to be logged in to access the requested material. The WIS team have been trying to rectify this blank screen problem with little success. The BIPM referred to on the WIS wiki is not a misspelling of BIP-M rather the international bureau of weights and measures <http://www.bipm.org/en/about-us/>*)

5.2 ET-GOV

5.2.1 Jan Sondij provided four objectives of the face-to-face meeting in Wellington:

- For ET-GOV, ET-ETC and ICAO MET Panel members to get to know each other;
- To finalize the work plan of the ET-GOV;
- To align the ET-GOV work plan with the ICAO MET Panel;
- To address ET-GOV tasks to individual ET-GOV, ET-ETC and ICAO METP members.

5.2.2 The group discussed how to optimize the working mechanisms and agreed on the following:

- To use Google docs in working on common documents, however, this may be not feasible for some members. The Secretariat will investigate whether all members are capable of working in this environment. **[Action 17]**
- To use the term Aeronautical Meteorology Service Provider (AMSP) consistently in the communication and documentation of ET-GOV.
- To conduct the next ET-GOV WebEx in April 2016. A doodle poll will be set up in January 2016 by Jan Sondij. The preferred time is 9 pm Amsterdam local time. **[Action 18]**
- The proposal to hold two Webex meetings, given the global span of membership, was not supported. The meeting noted that there is a possibility to use the WebEx recording function to provide information to members that could not attend the Webex.

5.2.3 ET-GOV has eight main activities to consider in the time frame from December 2015 until May 2018. In all, the ET-GOV has 30 months remaining to accomplish these tasks, which is rather challenging. The activities are:

- 1) Monitor global landscape of aeronautical meteorological service provision;
- 2) Guidance on oversight of aeronautical meteorological service provision;
- 3) Governance issues;
- 4) Guidance on roles and responsibilities of meteorological authorities and meteorological service providers;
- 5) Review of WMO-No. 732, Guide to practices for meteorological offices serving aviation;
- 6) Address WMO and ICAO data management and governance policies;
- 7) Coordination of evolution of WMO regulatory and guidance material on aeronautical meteorology;
- 8) Reporting on progress of WMO CAeM ET-GOV.

Activity 1: Monitor global landscape of aeronautical meteorological service provision

5.2.4 The meeting considered the need for establishing a base line of the current aeronautical meteorological service provision by WMO Members. Information currently available is based on surveys from more than 5 years ago and not covering all regions evenly. A future survey would include information about the organization of regulator, oversight and service provider and the various meteorological functions (AMS, AMO, MWO etc.), legislative framework, implementation of QMS, SMS and competency assessment, and cost recovery.

5.2.5 The ET agreed that the aim should be to have a system in place that allows for regular updates of the survey and minimizes the workload of the ET-GOV. As such, a web survey tool is to be used, and the use of free text is to be limited. WMO offers to make use of the survey platform SurveyMonkey for which WMO has license to use it. The meeting noted that ET-GOV should have full control of the survey. **[Action 19]**

5.2.6 Regarding the design of the survey, the ET agreed that the number of questions must be kept to a minimum in order to increase the success rate of the survey. Future updates of the survey can be used to gather more detail on specific topics. A first outline of questions will be provided by Jan Sondij by the end of February 2016. **[Action 20]**

5.2.7 Several issues were identified with regard to the survey.

- The target responders in some Members are the AMSPs that are not NMHSs (e.g., 30 % in the EUMETNET area in Europe), and as such addressing the WMO Members may not always result in addressing the service provider as well.
- In some countries, several AMSPs may have been designated.
- How to come up with an email list that is up-to-date and is directed at the responsible staff member within that organization? Several options have been discussed including using the CAeM Member list (which is not up-to-date, and includes more than one person) or using the international advisors (INTADs) of NMHS organisations.
- How to deal with language issues? Will the questionnaire be in English only, or is there a need to translate the questions and the responses in order to provide a global picture in the English language.

5.2.8 The meeting discussed eventual communication strategies that would guarantee a good rate of return to the questionnaire and also gathering information from other possible sources to create a representative “baseline”. Among those were:

- Working with ET-CCP to update the CAeM members list. **[Action 21]**
- Engage WMO Regional Offices to stimulate Members to respond to the survey.
- Make use of already available information, e.g. within ICAO and WMO.
- Request ICAO to provide information available through the regular monitoring of compliance via the Universal Safety Oversight Audit Programme (USAOP) (see [Doc. 5.2\(1\)](#)). This could serve as an important base for the survey and compliance monitoring. The question is whether this information could be made available by ICAO and could be used in the public domain. **[Action 22]**

5.2.9 The activities with regard to the survey on the current baseline of meteorological service provision will be added to the work plan under Activity 1. Target date for sending out the survey to Members is end of May 2016, in order to have a paper with results before October 2016.

Activity 2: Oversight of aeronautical meteorological service provision

5.2.10 ET-GOV objective (d) is to collect and share best practices in relation to competency of aviation MET service oversight personnel and provide input to ICAO for the development of guidance material. There was general consensus within the team that the personnel providing oversight does not necessarily have to be qualified as an aeronautical meteorologist. However, oversight staff needs to have meteorological industry knowledge and access to an array of competences covering various domains.

5.2.11 The ET noted information by Dennis Hart on the course that is provided by EUROCONTROL to oversight staff of National Supervisory Authorities in Europe. Michael Berechree presented a document of the Bureau of Meteorology (BOM - Australia) on qualifications and competencies of meteorological office staff. Given the information being provided during the meeting, it was decided that there was no need to conduct a global survey by the ET-CCP as identified earlier in the ET-GOV work plan.

5.2.12 The meeting concluded that the best way forward is to start with creating a skeleton or strawman of guidance documentation, based on the BOM document. Once the skeleton is provided, members from ET-GOV and METP MCRGG will be requested to provide input to the document. It was agreed that the document will contain also a number of good national practices with inputs from ET members. The available (scarce) information on MET inspectorate in ICAO Doc 8896 should also be taken into consideration. The final report (deliverable) will be provided to

the ICAO METP and made available at the CAeM web portal. This will also be used as input for the revision of WMO-No.732 under Activity 5. **[Action 23]**

Activity 3: Governance issues

5.2.13 Activity 3 deals with governance and cost recovery issues and the group had a fruitful discussion on how to deal with the objectives. One important and shared notion was that not all AMSPs may continue to be full service providers in the future. However, equally important is the notion that this does not prevent cost recovery of meteorological core infrastructure from aviation in that situation to support local and sub-regional operations.

5.2.14 With regard to Small Island Developing States (SIDS), the following governance and cost recovery issues were mentioned:

- Lack of sustainable funding and/or focus to provide services;
- Lack of understanding of regulatory requirements/frameworks;
- Low traffic volumes that do not generate sufficient income from service taxes;
- No mechanism en-route / terminal charges for cost recovery;
- No forecasting capacity / qualified staff;
- Lack of understanding ICAO obligations and in some cases no MET authority designated;
- Lack of understanding of the importance of their airports for the ETOPs operations;
- Specific issue related to Fiji Meteorological Service as the AMSP of TAF and SIGMET for the SW Pacific region;
- No transparency and inclusiveness in cost recovery;
- QMS implementation is slow in some of the SIDS due to resource issues.

[Action 24]

5.2.15 Concerning the global governance and cost recovery, the ET considered a list of known issues, as follows:

- With regard to AMSPs not receiving funding for its services:
 - Mechanism/methodology to separate between en-route and terminal charges not established;
 - Who collect the charges at the level of government?
 - MET charges are collected at the level of government but not forwarded to NMHS/AMSP;
 - No incentive or mandate to create cost recovery system as there is a fear that this will reduce the guaranteed government budget;
 - Actual MET costs are not analysed/known by the NMS/AMSP;
 - Lack of cost allocation system;
 - Regulator is not known;
 - No coordination and transparency with government and users;
 - Lack of communication strategy and appropriate negotiation skills.
- With regard to AMSPs that cannot recover full cost:
 - Legal system / regulatory instrument is not in place;
 - Cost reduction targets (Europe Performance Scheme RP2);
 - Fair share of core infrastructure cannot be recovered.

- With regard to AMSP cost allocation system:
 - Allocation system challenges;
 - No standard costing model;
 - Internal discussion can be more difficult than external discussions.
- With regard to regional cost recovery:
 - How to recover costs for a regional training centre (consult with ET-ETC);
 - Cost-recovery for VAACs and TCACs (no established good practice).

5.2.16 The ET-GOV general conclusion was that, in many cases, the lack of transparency, equity of cost allocation, lack of communication strategy and appropriate negotiation skills contribute to the governance and cost recovery issues that impact directly on AMSP. A number of deficiencies (e.g. SIGMET) are related to the circumstances listed above. It is proposed to link to the set of deficiencies table of the WMO Secretariat.

5.2.17 In addition, ET-GOV noted that there are cases where the private providers use OPMET data inappropriately via the public internet for additional service provision outside the aviation domain. It was noted in this regard that IATA has a position paper on meteorological charges.

5.2.18 The meeting agreed that the best way to tackle these difficult topics is to gather global information on cost recovery and governance in order to identify good practices and practical solutions that could be included in the future guidance material on cost recovery. **[Action 25]**

5.2.19 With regard to the needed new guidance on specific cost-recovery issues in the case of regional (multi-national) service provision, in order to support the ICAO MET DIV 2014 recommendation on future regionalization (e.g., the RHWAC), a draft information paper on existing good practices with regard to regionalization of services should be provided by ET-GOV. This activity could start with examining different levels of regionalization within larger countries such as Canada, China, the Russian Federation and USA, as well as the experience of NAMCON. **[Action 26]**

5.2.20 The ET recognized that the main deliverable concerning the cost-recovery part of Activity 3 will be an update and enhancement of the WMO-No. 904, *Guide on aeronautical meteorological services cost recovery*. The Guide should provide more practical guidance to Members to develop their cost-recovery mechanisms, including the cases of multi-national service provision. It is also envisaged to include more examples of national/multi-national good practices. ET members and the other experts were invited to provide input material for the update of WMO-No. 904. **[Action 27]**

5.2.21 Based on these inputs and given the high work load on ET-GOV, next steps on Activity 3 will be decided upon during future ET-GOV WebEx session.

Activity 4: Guidance on roles and responsibilities of meteorological authorities and meteorological service providers

5.2.22 The objective of Activity 4 is to collect and share best practices of national institutional arrangements with regard to the roles and responsibilities of meteorological authority and meteorological service provider. The need for additional guidance on this issue has been raised by several Regional Associations and also at the MET DIV 2014 (recommendation 4/2 refers). Thus, ET-GOV should provide inputs for the improvements of relevant ICAO and WMO guidance material. The meeting noted that there were some language issues associated with translating the term MET Authority into other UN languages; inputs from native speakers of the other UN languages would be requested to develop unambiguous understanding.

5.2.23 ET-GOV recognized that guidance was required on the roles and responsibilities of the regulator, oversight and service provision, and the related notion of MET authority. It is

acknowledged that there should be functional separation between these functions. The meeting agreed that this does not necessarily mean that these functions have to be performed by different organizations, as one entity could perform several functions.

5.2.24 As a WMO guidance, the document to be prepared should provide an NMHS perspective. Included will be links to various documents where these functions are addressed, legislative frameworks, the relationship with cost recovery for the service provisions. Various service delivery models, including cross border service provision, should be analysed, as well as the link with commercial service providers. The document would present a number of national and regional good practices, e.g., the role of EASA regulations for EU Member States. **[Action 28]**

Activity 5: Review of WMO-No.732, Guide to practices for meteorological offices serving aviation

5.2.25 The objective of Activity 5 is to work, in coordination with the ICAO METP, to review/update/consolidate existing service delivery guidance material e.g. WMO-Nos. 732, 904 and 1001, in collaboration with the appropriate CAeM ETs and other WMO bodies. It is intended that the output of the guidance material of activity 2 and 4 will be included in this document.

5.2.26 The review will consider the name of the document, a possible merge with WMO-No. 731, the current situation on data policies and input of ET-ETC on training and competence. As a start, a draft outline of the revised WMO-No. 732 should be prepared. **[Action 29]**

5.2.27 The meeting noted that, once a decision on the new structure of WMO-No. 732 has been made, there would be a consultant hired by WMO to draft a revised version of the document. The draft will then be reviewed by all relevant CAeM ETs with the target to finalize and publish by mid-2017. **[Action 30]**

Activity 6: Address WMO and ICAO data management and governance policies

5.2.28 The meeting agreed on the objective of Activity 6 as: to address relevant WMO and ICAO data management and governance policies in consultation with the ICAO METP and relevant WMO bodies.

5.2.29 The meeting noted that the ICAO Information Management Panel (IMP) together with the METP WG-MIE have been tasked with dealing with MET data policies. There is a link to the governance of SWIM as detailed in METP Job Card 12. WMO ET-GOV will provide input to the ICAO METP.

5.2.30 At the moment, a general review of WMO data policy, including the current resolutions 40 (Cg-XII, free data exchange for operational services) and 25 (Cg-XIII, hydrological data and products) is focused on climate data. The meeting noted that some WMO Members' general data policies (e.g. EU Member States) already deviate from the current WMO resolutions.

5.2.31 The meeting noted that the "aeronautical information generated specifically to serve the needs of aviation" (i.e., OPMET information), is not considered to be part of resolution 40, as stated in footnote 3 of Appendix IV to resolution 40 ("*Aeronautical information generated specifically to serve the needs of aviation and controlled under the Convention on International Civil Aviation (Chicago, 1944) is not included in the application of the practice*").

5.2.32 The meeting noted further that there was a link with METDIV14 recommendation 3/2, Inclusion of aeronautical meteorological information in the future SWIM-enabled environment: "*d) the evolution towards an information management environment should be guided by a roadmap including a transparent system of governance and risk mitigation actions and the foreseen role of existing ICAO information exchange functions for aeronautical meteorology such as regional OPMET databanks (RODB), inter-regional OPMET gateways (IROG) and internet based services.*"

5.2.33 ET-GOV concluded that, at the moment, there were no concrete tasks for the ET for activity 6, other than describing the current situation with regard to data policies in the revised WMO-No. 732, as part of Activity 5. Future tasks are dependent on the outcome of SWIM developments and the WMO task team on data policies. It was noted that SWIM did not imply that aeronautical meteorological data would be available for free to the public.

5.2.34 The meeting was made aware that IATA sees a business case in providing worldwide aircraft derived data (IATA presentation at WMO ECMA RA VI); such development should also be monitored as they would have impact on the meteorological service provision in general.

Activity 7: Coordination of evolution of WMO regulatory and guidance material on aeronautical meteorology

5.2.35 Having considered the review/update/consolidation of existing service delivery guidance material (e.g. WMO-Nos. 732, 904 and 1001) under Activity 5, the objective of Activity 7 was to coordinate the evolution of the WMO regulatory material on aeronautical MET in line with ICAO plans for amendment and restructuring of Annex 3.

5.2.36 The Secretariat advised about the new guidelines in WMO-No. 1127, *Guidelines on the Preparation and Promulgation of the WMO Technical Regulations*, which should facilitate a homogeneous approach in developing regulations and guidance.

5.2.37 It was clarified that the restructuring of ICAO Annex 3 is under the remit of the ICAO METP WG-MRI as described in Job Card 6. The timeline for this task is as follows:

- AMD 77, November 2016: Keeping the existing structure; PANS-MET is not in scope;
- AMD 78, November 2018: PANS-MET is not in the scope;
- AMD 79, November 2020: introduction of PANS-MET and revised Annex 3.

5.2.38 The meeting was informed that Michael Berechree is WG-MRI activity leader and working on a strawman of the PANS-MET based on AMD 77. The METP deadline for delivering the draft documents is November 2017 and the deadline for WG-MRI to deliver a mature draft is Q2 2017.

5.2.39 Direct input from ET-GOV to the MRI activity is not required at this time. Given the planned timelines for introduction of the PANS-MET and the revised ICAO Annex 3 in 2020, the task of ET-GOV should be to perform an assessment on the required process, different solutions, and impact within the WMO system. The deliverable should be a documented proposal for the future development of WMO regulations and guidance in aeronautical meteorology, to be submitted for approval by CAeM and the executive WMO bodies.

5.2.40 Different options should be reviewed, including: a) a parallel revision of WMO Technical Regulation 49, Volume II; and b) a possible discontinuation of Technical Regulation 49, Volume II. The assessment should take into account all existing WMO documentation (technical regulations, manuals, guides) and how to deal with a PANS-MET document in a WMO context. ET-GOV should liaise with WG-MRI to identify opportunities to optimize the number of regulatory and guidance documents by consolidating information from ICAO and WMO and joint publications where possible. These issues should be considered in the context of the planned review and update of the working arrangements between ICAO and WMO.

5.2.41 Another aspect of the review process should be the use of information technology for better access to the regulatory and guidance material by Members and users. Future documents could be made available online in the form of e-documents and to keep printed publication only as necessary. An example is [WMO-No. 1112, Guidelines on the role, operations and management of the national meteorological or hydrometeorological services \(NMSs\)](#).

5.2.42 The proposal should include a regular review process on guidance and regulatory material as part of the WMO QMF. It is also advised to include the documents in the content management system (CMS) of WMO. Obsolete documents and old versions of actual documents could still be kept on the WMO website with a clear marking that the document is obsolete.

5.2.43 The final document that includes a proposal for WMO and ICAO documentation on aeronautical meteorological service provision has to be available in October 2017. This will enable consideration of the proposal at CAeM-16 in April 2018, and at WMO Cg-18 in 2019. **[Action 31]**

Activity 8: Reporting on progress of WMO CAeM ET-GOV

5.2.44 Regular reporting of process of the ET-GOV is a task for the co-chairs and is foreseen annually. For 2015, the reporting consists of the minutes of the face-to-face meeting in Wellington, the updated ET-GOV work plan, and the powerpoint presentation for the MG WebEx in December 2015.

6. UPDATE OF WORK PLANS & DELIVERABLES

6.1 The updated work plan of ET-ETC is provided as Annex 4 to the report.

6.2 The updated work plan of ET-GOV is provided as Annex 5 to the report.

7. ET WORK PLAN IMPLEMENTATION

7.1 Implementation issues and strategies have been discussed under agenda item 5 and respective actions included in the updated work programmes.

7.2 The Secretariat informed of the possibility for internships and secondments to the AEM Division which will facilitate the work on some of the ETs task (e.g., the survey, the review of WMO-No. 732).

8. ANY OTHER BUSINESS

8.1 ET-ETC requested Dimitar to contact the WAFCs regarding providing WAFS resource material to support the second level competencies for the AMF (some material may also be available in ICAO 8896). Similar material may be needed for the VAACs, TCACs, Radioactive hazards, Space Weather and SADIS. **[Action 32]**

9. CLOSURE OF THE MEETING

9.1 After the customary exchange of courtesies, the meeting closed at 15:00 on 3 December 2015.

WORLD METEOROLOGICAL ORGANIZATION

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Joint Meeting of ET-ETC and ET-GOV

Wellington, New Zealand
30 November – 3 December 2015

AGENDA

1. ORGANIZATION OF THE MEETING

- 1.1. Opening of the meeting
- 1.2. Adoption of the agenda
- 1.3. Working arrangements

2. REVIEW OUTCOMES AND DIRECTIONS BY RELEVANT WMO AND ICAO MEETINGS

- 2.1. ICAO METP/1 and subsequent developments
- 2.2. CAeM MG/2015
- 2.3. WMO 17th Congress

3. REVIEW AND UPDATE OF ET WORK PLANS

- 3.1. Mapping of ET tasks and timelines to ICAO MET Panel jobcards and working groups/work streams plans

4. COORDINATION AMONG EXPERT TEAMS

- 4.1. Identification of common objectives (e.g. in competencies, regionalization)
- 4.2. Discussion of top priorities for ET collaboration
- 4.3. Sharing of responsibilities

5. EXPECTED KEY DELIVERABLES

- 5.1. ET-ETC
- 5.2. ET-GOV

6. UPDATE OF ET WORK PLANS & DELIVERABLES

7. ET WORK PLAN IMPLEMENTATION

8. ANY OTHER BUSINESS

9. CLOSURE OF THE MEETING

WORLD METEOROLOGICAL ORGANIZATION

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Joint Meeting of ET-ETC and ET-GOV

Wellington, New Zealand
30 November – 3 December 2015

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Implementation Guidance of Aeronautical Meteorological Observer Competency Standards

1.1 The following guidance is supplementary to the AMP competency Standards endorsed by Cg-16 in Geneva in May 2011. Please note that the information contained in this guidance material replaces that which previously existed in the publication, 'Supplement No.1 to WMO-No.258.'

1.2 Format of the Descriptions

The text is structured according to the following format:

Position title: Aeronautical Meteorological Observer (AMO)

Application conditions: (from WMO-No. 49, Volume I)

- A. for the area and airspace of responsibility,*
- B. in consideration of the impact of meteorological phenomena and parameters on aviation operations, and*
- C. in compliance with aviation user requirements, international regulations, local procedures and priorities.*

Top-level competency Standard (also from WMO-No. 49, Volume I)

- Competency descriptions for each standard
- Performance criteria for each standard

Background knowledge and skills

Regional variations.

1.3 The importance of the preamble to the top-level competency Standards is emphasized. There will be considerable variation in the legitimate functions of aeronautical meteorological offices worldwide, and it is not possible to write a document that exactly matches every office's function. Therefore the performance criteria should be applied in a way that is consistent with these variations. For example, it is recognized that meteorological offices in the tropics will not have a responsibility to observe blowing snow (Performance criterion 2.1). The conditions A, B and C provide for this.

1.4 It is intended that the responsibility for meeting the Top-level competency Standards will, in the first instance, rest with the organization to which the AMO belongs. The responsibility of the individual will then be to meet (or exceed) the particular competencies which apply to his or her specific job within the organization (usually specified in terms of a job description).

1.5 In some organizations, the competencies may be collectively satisfied by a team or by multiple groups. In such cases the organization is responsible for ensuring that each individual does his or her part of the job to the required standard so that the Top-level competency Standards are met.

1.6 The role of observers will continue to change in response to evolving technology and user requirements. The guidelines presented in this document attempt to anticipate as far as possible imminent changes, but a review cycle of not more than 3-5 years as part of the overall Quality Management and Risk Management approach is strongly suggested.

C1. MONITOR CONTINUOUSLY THE WEATHER SITUATION**Competency description**

Weather parameters are appraised to identify the significant and evolving weather phenomena that are affecting or will likely affect the area of responsibility throughout the watch period.

Performance criteria

C1.1. Analyse and describe the existing local weather conditions.

C2. OBSERVE AND RECORD AERONAUTICAL METEOROLOGICAL PHENOMENA AND PARAMETERS**Competency description**

Observations of weather parameters and phenomena, and their significant changes, are made according to documented thresholds and regulations.

Performance criteria

- C2.1. Perform and record routine and non-routine observations of the following:
- a) surface wind direction and speed, including spatial and temporal variations
 - b) visibility for aeronautical purposes, including spatial and temporal variations
 - c) RVR, including spatial and temporal variations
 - d) significant weather phenomena (as defined in ICAO Annex 3)
 - e) cloud amount, height of base, and type, including spatial and temporal variations
 - f) vertical visibility
 - g) temperature and humidity
 - h) atmospheric pressure; determining QFE and QNH
 - i) supplementary information, wind shear and special weather phenomena.
- C2.2. Interpret automatic observed parameters to ensure that observations remain representative of local conditions when differences occur between automatic sensor technologies and manual observing techniques.
- C2.3. Ensure that observations are prepared and issued in accordance with ICAO Annex 3, WMO-No.49, regional and national formats, codes and technical regulations on content, representativeness and timeliness.

C3. ENSURE THE QUALITY OF THE PERFORMANCE OF SYSTEMS AND OF METEOROLOGICAL INFORMATION**Competency description**

The quality of meteorological observations is maintained at the required level by the application of documented quality management processes.

Performance criteria

- C3.1. Apply the organization's quality management system and procedures.
- C3.2. Check and confirm the quality of meteorological observations before issuance, including relevance of content, time of validity and location of phenomena.
- C3.3. In accordance with prescribed procedures:
 - i) identify errors and omissions in meteorological observations
 - ii) correct and report errors and omissions
 - iii) make and disseminate corrections in a timely manner.

C4. COMMUNICATE METEOROLOGICAL INFORMATION TO INTERNAL AND EXTERNAL USERS**Competency description**

All meteorological data and information are concise, complete and communicated in a manner that will be clearly understood by the users.

Performance criteria

- C4.1. Ensure that all observations are disseminated through the authorized communication means and channels to designated user groups.
- C4.2. Present² aeronautical meteorological data and information in a clear and concise manner using suitable terminology.
- C4.3. Alert forecasters to observed or imminent significant changes in the weather within the local area.

² Reference may be made to ICAO Annex 1 English language proficiency requirements when English is required to be used as a medium of communication.

1.7 Background knowledge and skills for the AMO competencies

The background knowledge and skills listed below underpin the performance criteria for AMOs:

- i) the key characteristics of the troposphere and tropopause
- ii) properties of air pressure, temperature, density and water vapour
- iii) atmospheric stability, inversions
- iv) the generation mechanisms of wind
- v) fog and cloud formation and dissipation
- vi) precipitation types and intensities
- vii) the general circulation of the Earth's atmosphere
- viii) the International Standard Atmosphere (ISA)
- ix) the characteristics, occurrence and effects of meteorological hazards to aviation, including low-level cloud ceiling, poor visibility, thunderstorms and associated phenomena, aircraft icing, freezing precipitation, turbulence, tropical cyclones, wind shear and volcanic ash
- x) interpretation of surface weather maps, satellite and radar imagery
- xi) region-specific weather phenomena, and likely weather sequences that are expected to affect the station
- xii) local topography and climatology
- xiii) procedures for performing routine and non-routine aeronautical meteorological observations and reports
- xiv) impacts of weather on aircraft and airport operations
- xv) strengths and weaknesses of manual observations and automatic observing systems
- xvi) observer directives, procedures and instructions
- xvii) validated sources of weather information
- xviii) quality management systems
- xix) aviation safety management systems, as required
- xx) standards (as defined in ICAO Annex 3, WMO-No.49) and Quality Management System procedures (as defined in ISO 9001 standards, national regulations):
 - a) procedures for checking and identifying errors and omissions (in automatically and manually derived data)
 - b) how to identify significant differences between observational and forecast data
 - c) when to ignore information and where to go to resolve points of contention
 - d) desirable accuracies of measurement and observation as in ICAO Annex 3, WMO-No.49 and national regulations
 - e) priority tasks and time constraints
 - f) actions to be taken in the event of repeated cases of discrepancies, inconsistencies and malfunctions
 - g) fall-back procedures in the case of computer failure

- h) contingency arrangements in case of emergencies such as fire, bomb alerts and natural disasters

- xxi) relevant ICAO and WMO documents, including ICAO Annex 3, WMO-No.49, WMO-No.306, ICAO Manual of Aeronautical Meteorological Practice (Doc8896), and ICAO Manual on Automatic Meteorological Observing Systems at Aerodromes (Doc9837). See Appendix for a list of relevant ICAO and WMO documents

- xxii) ICAO definitions of relevance to meteorology

- xxiii) WMO Traditional Alphanumeric Codes (TAC) and national aeronautical meteorological codes and forms of data representation

- xxiv) how weather information is disseminated at the aerodrome

- xxv) local aeronautical meteorological telecommunications

- xxvi) local Air Traffic Services meteorological requirements

- xxvii) local flight planning meteorological requirements.

1.8 Regional variations

- i) The range of significant weather phenomena
- ii) Extent of automation of observing and sensing systems
- iii) Thresholds for significant weather changes
- iv) Local climatology
- v) Extent, scope and exclusions of QMS implementation
- vi) Regional regulations
- vii) Communication language(s)
- viii) Available communication technologies.

Implementation Guidance of Aeronautical Meteorological Forecaster Competency Standards

1.1 The following guidance is supplementary to the AMP competency Standards endorsed by Cg-16 in Geneva in May 2011. Implicit in the background knowledge and skills for AMF is the requirement that they should, in taking into account the AMF Competency Standard 'conditions A to C', have successfully completed the BIP-M and that this requirement will become mandatory from 1 December 2016. It should however be recognized that national personnel qualification requirements for AMF can be set at a higher level, e.g. a national requirement for an AMF to also be degree qualified. Please also note that the information contained in this guidance material replaces that which previously existed in the publication, 'Supplement No.1 to WMO-No.258.'

1.2 Format of the Descriptions

The text is structured according to the following format:

Position title: Aeronautical Meteorological Forecaster (AMF) or Aeronautical Meteorological Observer (AMO)

Application conditions: (from WMO-No. 49, Volume I)

A. for the area and airspace of responsibility,

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

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

Top-level competency Standard (also from WMO-No. 49, Volume I)

- Competency descriptions for each standard
- Performance criteria for each standard

Background knowledge and skills

Regional variations.

1.3 The importance of the preamble to the top-level competency Standards is emphasized. There will be considerable variation in the legitimate functions of aeronautical meteorological offices worldwide, and it is not possible to write a document that exactly matches every office's function. Therefore the performance criteria should be applied in a way that is consistent with these variations. For example, it is recognized that meteorological offices in the tropics will not have a responsibility to forecast blowing snow (Performance criterion 2.1). The conditions A, B and C provide for this.

1.4 It is intended that the responsibility for meeting the Top-level competency Standards will, in the first instance, rest with the organization to which the AMF belongs. The responsibility of the individual will then be to meet (or exceed) the particular competencies which apply to his or her specific job within the organization (usually specified in terms of a job description).

1.5 In some organizations, the competencies may be collectively satisfied by a team or by multiple groups. In such cases the organization is responsible for ensuring that each individual does his or her part of the job to the required standard so that the Top-level competency Standards are met.

1.6 There are plans for regionally coordinated Air Traffic Management projects such as NextGen in the USA and SESAR in Europe. This may soon be followed by similar tendencies in Asia for very dense airspace. Various developments are underway in aeronautical meteorological service delivery in support of the latest development in international civil aviation.

1.7 New concepts such as dedicated services for the wider Terminal Area, uplink of data with high refresh rate containing severe weather information such as weather radar- or satellite-based information are likely to complement, if not eventually replace the legacy, product-oriented services as currently prescribed in the ICAO Annex 3. This development will require a regular review of the required competencies of forecasters working either in a traditional Meteorological Watch Office or Aerodrome Meteorological Office, with more stringent criteria likely to be required for experts working at the regional advisory centres.

1.8 The role of forecasters will continue to change in response to evolving technology and user requirements and such a change in itself will also likely require high standards of competency and underlying

knowledge. The guidelines presented in this document attempt to anticipate as far as possible imminent changes, but a review cycle of not more than 3-5 years as part of the overall quality management and risk management approach is strongly suggested.

C1. ANALYSE AND MONITOR CONTINUOUSLY THE WEATHER SITUATION

Competency description

Observations and forecasts of weather parameters and significant weather phenomena are continuously monitored to determine the need for issuance, cancellation or amendment/update of forecasts and warnings according to documented thresholds and regulations.

Performance criteria

- C1.1. Analyse and diagnose¹ the weather situation as required in forecast and warning preparation.
- C1.2. Monitor weather parameters and evolving significant weather phenomena and validate current forecasts and warnings based on these parameters.
- C1.3. Appraise the need for amendments to forecasts and updates of warnings against documented criteria and thresholds.

¹ "Analysis" may be defined as answering the question "what is happening?", and "diagnosis" as answering "why is it happening?"

C2. FORECAST AERONAUTICAL METEOROLOGICAL PHENOMENA AND PARAMETERS

Competency description

Forecasts of meteorological parameters and phenomena are prepared and issued in accordance with documented requirements, priorities and deadlines.

Performance criteria

C2.1. Forecast the following weather phenomena and parameters:

- a. temperature and humidity
- b. wind including temporal and spatial variability (wind-shear, directional variability and gusts)
- c. QNH
- d. cloud (types, amounts, height of base and vertical extent)
- e. precipitation (intensity and temporal variations, onset/cessation and/or duration, amount and types), and associated visibilities
- f. fog or mist, including onset/cessation and/or duration, and associated reduced visibilities
- g. other types of obscuration, including dust, smoke, haze, sand-storms, dust-storms, blowing snow, and associated visibilities
- h. hazardous weather phenomena listed in Performance criterion 3.1
- i. wake vortex advection and dissipation, as required.

C2.2. 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.

C2.3. Ensure that forecasts of weather parameters and phenomena are consistent (spatially and temporally) across boundaries of the area of responsibility as far as practicable, whilst maintaining meteorological integrity. This will include monitoring forecasts/warnings issued for other regions, and liaison with adjacent regions as required.

C3. WARN OF HAZARDOUS PHENOMENA

Competency description

Warnings are issued in a timely manner when hazardous conditions are expected to occur or when parameters are expected to reach documented threshold values, and updated or cancelled according to documented warning criteria.

Performance criteria

- C3.1. Forecast the following hazardous weather phenomena, including spatial extent, onset/cessation, duration, and intensity and its temporal variations:
- a. thunderstorms, particularly organized systems, including associated turbulence, in-flight icing, hail, heavy precipitation with poor visibility, electrical phenomena, down-burst/microburst or gust front, tornadic activity
 - b. turbulence (moderate or greater), including type (orographic, mechanical, convective and clear air turbulence).
 - c. moderate and severe low-level wind shear
 - d. aircraft icing (moderate or greater), including accumulation rate, spatial extent, type (rime or opaque, glaze or clear, freezing rain, hoar frost, mixed ice)
 - e. hazardous phenomena affecting aerodromes such as: strong surface winds including cross-winds and squalls, frost, freezing precipitation, snowfall, lightning, wake vortices
 - f. sand- and dust storms
 - g. volcanic ash based on observations and/or advisory products
 - h. tropical cyclones.
- C3.2. 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.
- C3.3. Ensure that warnings of hazardous weather phenomena are consistent (spatially and temporally) across boundaries of the area of responsibility as far as practicable, whilst maintaining meteorological integrity. This will include monitoring forecasts/warnings issued for other regions, and liaison with adjacent regions as required.

C4. ENSURE THE QUALITY OF METEOROLOGICAL INFORMATION AND SERVICES

Competency description

The quality of meteorological forecasts, warnings and related products is ensured at the required level by the application of documented quality management processes.

Performance criteria

- C4.1. Apply the organization's quality management system and procedures.
- C4.2. Assess the impact of known observational error characteristics (e.g. bias, achievable accuracy of observations and sensing methods) on forecasts and warnings.
- C4.3. Validate aeronautical meteorological data, products, forecasts and warnings (timeliness, completeness, accuracy), using real-time checks.
- C4.4. Monitor the functioning of operational systems and take remedial actions when necessary.

C5. COMMUNICATE METEOROLOGICAL INFORMATION TO INTERNAL AND EXTERNAL USERS

Competency description

User requirements are fully understood and are addressed by communicating concise and complete forecasts/warnings in a manner that can be clearly understood by the users.

Performance criteria

- C5.1. Ensure that all forecasts/warnings are disseminated through the authorized communication means and channels to designated user groups.
- C5.2. Explain² aeronautical meteorological data and information, deliver weather briefings and provide consultation to meet specific user needs.

² Reference may be made to ICAO Annex 1 English language proficiency requirements when English is required to be used as a medium of communication.

1.9 Background knowledge and skills for the AMF competencies

The background knowledge and skills listed below underpin the performance criteria for AMFs:

- i) Taking into account of the AMF competency Standards conditions A to C, the BIP-M requirements as described in the next revision of WMO-No 49 Volume I. These can currently be found in the Cg-16 PINK06-2_ETR_en_2.doc at <ftp://ftp.wmo.int/Documents/SESSIONS/Cg-XVI/English/Approved%26Corrected/>.
- ii) the generation mechanisms of low-level jet-streams, boundary layer turbulence and gusts, and their effects on aircraft
- iii) the formation and dissipation, characteristics, occurrence and effects of fog and other forms of obscuration, and low-level cloud, and associated diagnostic and prognostic parameters
- iv) mechanisms for generating different types of cloud and precipitation, and local enhancement mechanisms for cloud and precipitation
- v) volcanic ash cloud displacement and dispersion
- vi) formation mechanisms and characteristics of other aeronautical meteorological phenomena, such as dust-storms, sand-storms, dust devils, waterspouts
- vii) the International Standard Atmosphere (ISA)
- viii) meteorological hazards to aviation, including thunderstorms and associated phenomena, aircraft icing, turbulence, poor visibility, low-level cloud, tropical cyclones, wind shear and volcanic ash.
- ix) local topography and its effects on weather, such as gap flows, downslope windstorms, orographic turbulence, sea breezes and upslope fog
- x) the topographic influence on cloud, precipitation, fog and reduced visibility in typical wind and moisture regimes
- xi) areas of likely volcanic activity within the region of responsibility (for offices with responsibility for issuing volcanic ash advice and offices located close to volcanoes).
- xii) interpretation of:

- a. radar and satellite imagery to identify fog and stratus, gravity waves in cirrus cloud and jet streams, inference of icing potential in layer cloud, and of volcanic ash and wind-shear.
- b. numerical weather prediction guidance and other forms of objective guidance, and assimilate them into forecast/warning preparation
- c. observed parameters when variations result from differences between automatic sensor technologies and manual observing techniques
- xiii) ability to interpret all observational products (e.g. METAR), and encode forecast products (e.g. TAF, SIGMET) into Traditional Alphanumeric Codes (TAC)
- xiv) airport climatologies, including occurrence of significant cloud, thunderstorms, precipitation, high winds, low-level windshear, reduced visibility, fog and, where applicable, volcanic ash
- xv) local forecasting guides and techniques, including diagnostic and prognostic parameters, for forecasting significant cloud, thunderstorms, turbulence, aircraft icing, precipitation, high winds, low-level windshear, reduced visibility, fog and, where applicable, volcanic ash
- xvi) ability to carry out a routine, high quality self-briefing (which may include a shift hand-over briefing) of the recent and current weather situation, and integrate all available data to produce a consolidated diagnosis
- xvii) international, national and local aeronautical forecast/warning/monitoring procedures, directives and instructions
- xviii) local diagnostic and forecast tools and aeronautical forecast preparation systems, including basic operating system functions, data processing and visualization technologies
- xix) ability to explain the meteorological and procedural reasons behind a forecast and warning decision
- xx) the likely impact of forecasts of meteorological parameters and phenomena on aviation operations
- xxi) the significance of warning thresholds on aviation operations, and the ability to describe the likely impact of warnings of hazardous phenomena on these operations
- xxii) applicable TAF verification system(s) and verification statistics
- xxiii) latest developments in aeronautical weather monitoring and observing technologies, and aeronautical forecasting techniques in use at the service provider
- xxiv) quality management systems
- xxv) aviation safety management systems, as required
- xxvi) standards (as defined in ICAO Annex 3, WMO-No.49) and Quality Management System procedures (as defined in ISO 9001 standards, national regulations):
 - a. procedures for checking and identifying errors and omissions
 - b. how to identify significant differences between factual and forecast data
 - c. when to ignore information and where to go to resolve points of contention
 - d. desirable accuracy of forecasts as stipulated in ICAO Annex 3, WMO-No.49 and national regulations
 - e. priorities and schedules
 - f. actions to be taken in the event of repeated cases of discrepancies, inconsistencies and malfunctions
 - g. fall-back procedures in the case of computer failure
 - h. contingency arrangements in case of emergencies such as fire, bomb alerts and natural disasters.

- xxvii) relevant ICAO and WMO documents, including ICAO Annex 3, WMO-No.49, WMO-No.306, and ICAO Manual of Aeronautical Meteorological Practice (Doc8896). See Appendix for a list of relevant ICAO and WMO documents
- xxviii) ICAO, WMO and national aeronautical meteorological codes and forms of data representation
- xxix) aviation user requirements, including:
 - a. the effects on aircraft performance of air density, humidity, icing, low-level wind-shear, turbulence and wind, and the meteorological factors related to fuel consumption
 - b. the requirements for enroute wind, temperature and significant weather forecasts and aerodrome forecasts for pre-flight planning and in-flight re-planning
 - c. meteorological aspects of flight planning; definitions; procedures for meteorological services for international air navigation; types of meteorological information required for Air Traffic Services (ATS), aerodrome control towers, approach/area control, and flight information centers
 - d. low visibility runway operating procedures
 - e. effects of unfavourable meteorological conditions on aeronautical operations, including air traffic disruption, holding and diversions
 - f. meteorological effects on aerodrome ground services, such as snow clearing, the effect of wet runways, and the effect of thunderstorms and strong winds on apron operations
 - g. aerodrome operating minima, the need for alternates and impacts on fuel consumption
 - h. altimeter setting procedures
- xxx) common terms relevant to aeronautical meteorology, including:
 - a. (Special) Visual and Instrument Flight Rules and Conditions
 - b. Flight Information Region (FIR) / Functional Airspace Block (FAB)
 - c. final approach, missed approach
 - d. cruising and transition level, transition layer, transition altitude, Flight Level
 - e. Minimum Safe Altitude, Indicated Altitude, True Altitude
 - f. Category II and III operations, Aeronautical Information Publication (AIP)
 - g. NOTAMs / ASHTAMs
 - h. ATIS / VOLMET
- xxxi) the use and interpretation of products from the World Area Forecast System (WAFS); products provided by the Volcanic Ash Advisory Centres (VAACs), Tropical Cyclone Advisory Centres (TCACs) and other such centres
- xxxii) means of dissemination of aeronautical meteorological data and information
- xxxiii) local aeronautical meteorological telecommunications

1.10 Regional variations

- i) Locally agreed and documented criteria and thresholds
- ii) The range of weather phenomena
- iii) Risk assessment and estimation of forecast uncertainties
- iv) Types and use of forecast guidance
- v) Designated offices responsible for advice on volcanic ash, tropical cyclones and other phenomena
- vi) Regional regulations
- vii) Boundaries of forecast areas
- viii) Extent, scope and exclusions of QMS implementation

- ix) Communication language(s)
- x) Communications technology for forecast and warning transmission, and for weather briefing.

CAEM ET-ETC WORK PROGRAMME			
Version 2.0, January 2016 (approved by ET-ETC/1)			
Commission	WMO Commission for Aeronautical Meteorology (CAeM)		
Expert Team on	Education, Training and Competency		
Start / End Date	October 2014	June 2018	
Stakeholders	Aeronautical meteorological personnel; aviation user community; educators and trainers at NMHSs and training institutes		
Team	Name	Organization / Country	E-mail
Co-chairs	Chris Webster	MetService, New Zealand	chris.webster@metservice.com
	Bob Rutledge	NWS, USA	robert.rutledge@noaa.gov
Core Members	Paul Bugeac	Romanian Air Traffic Services Administration, Romania	paul.bugeac@gmail.com
	Kathy-Ann Caesar	Caribbean Institute for Meteorology and Hydrology, Barbados	kacaesar@cimh.edu.bb
	Andrea Henderson	Bureau of Meteorology, Australia	A.Henderson@bom.gov.au
	Jan Stander	South African Weather Service	Jannie.Stander@weathersa.co.za
	Raf Windmolders	Belgocontrol, Belgium	Raf_Windmolders@belgocontrol.be
ET/ETC Other (invited expert)	Queenie CC Lam	Hong Kong Observatory, Hong Kong, China	cclam@hko.gov.hk

DESCRIPTION	
Objective	Within the area of responsibility of the ET-ETC, to ensure the worldwide, reliable provision of high quality, timely, cost-effective and responsive meteorological service to users throughout the world in support of safe, regular and efficient aviation operations.
Background	The ET-ETC was first established by the 14th Session of CAeM (2010, Hong Kong, China) and re-established by the 15th Session of the CAeM (July 2014, Montreal, Canada).
Terms of Reference	<p>(a) To provide guidance on the implementation of WMO standards and recommended practices related to the competency and qualifications of aeronautical meteorological personnel (AMP);</p> <p>(b) To facilitate efficient methods of education and training in aeronautical meteorology by making education and training resources available online;</p> <p>(c) To encourage the sharing of education and training resources as well as best practices;</p> <p>(d) To look for cost-effective training opportunities and seek in-kind contributions to make these available in WMO official languages;</p> <p>(e) To coordinate with the WMO EC Panel of Experts on Education and Training in developing and updating WMO provisions on the competency and qualifications of AMP for inclusion in the WMO Technical Regulations and related guides;</p> <p>(f) To contribute to developing appropriate guidelines and other relevant material meeting aeronautical users' needs for training in aeronautical meteorology ;</p> <p>(g) To address emerging training and education needs for enhanced meteorological services stemming from the ICAO Global Air Navigation Plan (GANP) and the Aviation System Block Upgrades (ASBU);</p> <p>(h) To report regularly on progress to the president of CAeM.</p>

COMMUNICATION STRATEGIES				
Description	Target Audience	Delivery Method	Frequency / Date	Responsibility
Work Plan	ET-ETC	Email	Initial, and updated as required	Co-chairs
General correspondence	ET-ETC	Email	Introductions, and as required	ET-ETC
Team Meetings	ET-ETC	Conference calls Email contact FtF	At least biannually At least quarterly At least one during intersessional period (Dec 2015)	ET-ETC
Reports	CAeM	Email	As required	CAeM
Final Report	CAeM	Email	As required	CAeM

MILESTONES / WORKPLAN					
Milestone	TOR(s)	Accountability	Deliverables	Dates	Status
ACTIVITY 1: COMMUNICATIONS					
<i>Milestone 1.1: Establish communications</i>					
Task 1.1.1: Contact members and determine capability & interest in roles	-	Co-chairs	Welcome emails sent	Nov 2014	Done, 2014 & Feb 2015
Task 1.1.2: Assign liaison responsibilities by Region to core team members and invited experts	(c)	Co-chairs	Assignments agreed and implemented	Nov/Dec 2014	Done, Feb 2015
Task 1.1.3: Communicate regularly – see Comms strategies above	(h)	Co-chairs	Regular communications	on-going	on-going
<i>Milestone 1.2: F-t-F meetings</i>					
Task 1.2.1: Continue the global programme of workshops to assist Members with implementation of competency assessments.	(a), (c)	Co-chairs and workshop presenters	Successful completion of workshop(s)	Nov 2014, and beyond as required	RA-III workshop successfully completed, Nov 2014
ACTIVITY 2: DOCUMENTATION					
<i>Milestone 2.1: Develop, maintain and review documentation</i>					
Task 2.1.1: Prepare guidance material on AMP “second-level” competencies for formal publication, after consultation with ET-GOV. (relates to task 4.1.4 below)	(a)	AH, CW	Documents (& FAQs) reviewed and made available for WMO publication	March 2016	
Task 2.1.2: Develop a consistent process for dealing with requests from NMHSs and similar agencies for reviews of AMP educational documentation.	(f)	KC, PB	Process created and implemented. Requests logged and reported at ET-ETC meetings	March 2016	
Task 2.1.3: Maintain the ET-ETC Education & Training Website at http://www.caem.wmo.int/moodle/ , including posting of reviewed educational resources, and provision and moderation of discussion forums.	(b), (c), (d)	RW	Website available and up-to-date	on-going	on-going
Task 2.1.4: Maintain the AMP Competency Training Mapping Database at http://forum.14.caem.wmo.int/post14web/etet/master_list/web/ .	(b), (c), (d)	CCL	Database available and up-to-date	on-going	on-going

ACTIVITY 3: SUPPORT					
<i>Milestone 3.1: Support Members on Dec 2016 qualification requirement for AMF</i>					
Task 3.1.1: Support Members and training institutes in achieving the 1 Dec 2016 qualification requirement for AMFs.	(a), (b), (c), (f)	JS, CW	Raised profile of deadline, all requests for support responded to, and guidance developed on what will be required to be compliant	up to & beyond Dec 2016	
<i>Milestone 3.2: Support Members on competency requirements</i>					
Task 3.2.1: Support Members and training institutes by advising on achieving, demonstrating, assessing and documenting AMP competency requirements, including provision of examples of good practices.	(a), (c), (f)	PB, KC	Guidance document on supporting Competency Management	March 2016	
Task 3.2.2: Support Members in continuing to meet the AMP Competency requirements through a series of workshops as follow-ups to previous workshops dedicated to competency.	(a), (c), (f)	PB	Develop blended workshops dedicated to Competency implementation and assessment (to run in 2017)	Dec 2016	
<i>Milestone 3.3: Provide support in other areas</i>					
Task 3.3.1: Investigate translation of further educational materials into official WMO languages.	(d)	RW, CCL	Translation of some materials into another language	on-going	
Task 3.3.2: Follow up any relevant action items resulting from Cg-17 in May 2015.	-	Co-chairs	tba	as required	
Task 3.3.3: Keep up to date with developments in the ICAO Global Air Navigation Plan and Aviation System Block Upgrades, and coordinate related meteorological education and training resources as plans emerge, e.g. AvXML, ICAO Annex 3, PANS-MET.	(g)	Co-chairs	Advise on resources and advertise as plans emerge	as required	
ACTIVITY 4: RELATIONSHIPS					
<i>Milestone 4.1: Advise on AMP education & training issues</i>					

Task 4.1.1: Advise and assist ET-GOV and other bodies, such as RTCs, Regional Associations, Global Campus initiative and the EC Panel of Experts on Education & Training, on matters relating to AMP education and training.	(e)	CW, AH, Co-chairs	- Input into a new version of WMO-No.732. - Input into Competency Standards for the 'Met Inspectorate' - Other requests for advice responded to	- As in ET-GOV work plan - As above - on-going	
Task 4.1.2: Provide advice and, where possible, experts for other relevant workshops that are not under the direct control of ET-ETC.	(c), (d)	Co-chairs	All requests for advice responded to and experts provided if available	on-going	
Task 4.1.3: Support other Technical Commissions and bodies by providing guidance on implementation of competency standards outside the aviation area (e.g., marine, PWS, DRR, tropical cyclones).	relates to (a)	Co-chairs	Requests for advice fully answered	tba	
Task 4.1.4: Assist the EC Panel of Experts on Education & Training with a new WMO Guide on Competency Management (to relate to Ch 5 of a future edition of WMO-No. 49).	relates to (e)	AH, CW	Input provided to the new Guide	Outline done by March 2016	

CAEM ET-GOV WORK PROGRAMME			
<i>VERSION 0.6 14/12/2015</i>			
Commission	WMO Commission for Aeronautical Meteorology (CAeM)		
Title	Expert Team on Governance (ET-GOV)		
Start / End date	October 2014	August 2018	
Stakeholders	Air Traffic Management (ATM) community, Aeronautical Meteorological Service Providers (AMSPs), National Meteorological Services (NMHSs), ICAO MET Panel, WMO CAeM MG		
Team	Name	Organization / Country	E-mail
Co-chairs	Kent JOHNSON Jan SONDIJ	Environmental Canada, Canada KNMI, The Netherlands	kent.johnson@ec.gc.ca jan.sondij@knmi.nl
Core Members	Yuki KATO Peter LECHNER Jaakko NUOTOKARI Juana L. RAVINES RUIZ ZHANG Zhong Feng	JMA, Japan CAA, New Zealand FMI, Finland CAA, Peru CMA, China	yukikato@met.kishou.go.jp peter.lechner@caa.govt.nz Jaakko.nuottokari@fmi.fi jravines@mintc.gob.pe mazzf@vip.sina.com
Non-Core Members	Goama ILBOUDO Olga PETROVA	ASECNA Roshydromet, Russian Federation	ilboudogoa@gmail.com olpetrova2004@yandex.ru

DESCRIPTION	
Objectives	To provide guidance and address governance issues related to service improvements and institutional changes stemming from the ICAO Global Air Navigation Plan and the ICAO Aviation System Block upgrades (GANP/ASBU framework), including but not limited to cost recovery and the regionalization of aeronautical meteorological services. The results will be put forward to WMO CAeM and ICAO MET Panel during the intersession period and shall be reported to the WMO CAeM 16th session in 2018.
Background	<p>One of the purposes of WMO is to further the application of meteorology to aviation. The Aeronautical Meteorology Programme (AeMP) has the main long-term objective of ensuring worldwide, reliable provision of high quality, timely and cost-effective meteorological service to aviation users.</p> <p>In July 2014 the ICAO Meteorology Divisional Meeting (METDIV14), in part conjointly with the Fifteenth Session of the WMO CAeM (CAeM-15), took place in Montreal. The meeting addressed issues vital to the current and future provision of aeronautical meteorological services, in support of the "One Sky" concept and the related ICAO GANP/ASBU framework. The recommendations developed by METDIV14, direct the course of work for enhancing the provision of meteorological service to international air navigation.</p> <p>During CAeM-15 the Expert Team on Governance (ET-GOV) was established (CAeM-15 Final Report) and the objectives are listed in the final report. The CAeM Management Group Meeting (Cape Town May 2015) revised the Terms of Reference of ET-GOV and are described below. The connection of the ET-GOV objectives with the METDIV14 recommendations are listed as well.</p> <p>In April 2015 the first meeting of the ICAO Meteorology Panel (METP) took place in Montreal. The METP was established by the ICAO Air Navigation Commission to define and elaborate concepts and to develop ICAO provisions for aeronautical meteorological (MET) services consistent with operational improvements envisioned by the Global Air Navigation Plan (GANP) (Doc 9750) and in keeping with the Working Arrangements between the International Civil Aviation Organization and the World Meteorological Organization</p> <p>The METP shall collaboratively determine operational requirements for aeronautical MET service provision as an enabling function for a future globally interoperable air traffic management system and identify solutions, in coordination with WMO, to effectively and efficiently fulfil the requirements through sound scientific and/or technological capabilities. The activities of the METP are defined via Job Cards and the relation between the current Job Cards and the WMO ET-GOV objectives are described underneath.</p>

<p>Terms of Reference</p> <p>of WMO ET-GOV</p>	<p>Terms of Reference of WMO ET-GOV</p> <ul style="list-style-type: none"> a) To work in coordination with the ICAO METP to review/update/consolidate existing service delivery guidance material e.g. WMO-No. 732, 904 and 1001 in collaboration with the appropriate CAeM ETs and WMO bodies; b) To work in coordination with the ICAO METP on developing governance and cost-recovery guidance material to support the development of provisions for regional service provision, including Regional Hazardous Weather Advisory Centres; c) To address relevant WMO and ICAO data management and governance policies in consultation with the ICAO METP and relevant WMO bodies (<i>revised December 2015</i>); d) To collect and share best practices in relation to competency of aviation MET service oversight personnel and provide inputs to ICAO in developing guidance material; e) To collect and share best practices of roles and responsibilities of meteorological authority and meteorological service provider and provide inputs to ICAO in developing guidance material; f) To coordinate on the evolution of the WMO regulatory material on aeronautical MET in line with ICAO plans for restructuring Annex 3; g) To report regularly on progress to the president of the Commission;
<p>ET-GOV (a/b/c)</p>	<p>Connection with METDIV14 recommendations</p> <p>Recommendation 2/4 Review of MET information service provision framework to reflect GANP objectives</p> <p>b) (iv) development of guidance for States concerning how their ICAO obligations may be met in the context of local, sub-regional, regional, multi-regional and global MET, including cost recovery and governance considerations.</p> <p>d) ensure that guiding principles respecting the mandates of both ICAO and WMO are developed for States to facilitate inclusive MET service provisions to be done locally, sub-regionally, regionally, multi-regionally and globally when required and local, sub-regional, regional, multi-regional and global user communities could use this information in their operations.</p> <p>Recommendation 2/7 Development of provisions for information concerning space weather</p> <p>b) selection criteria and associated capability for the designation of global and regional space weather centers, including the optimum number thereof;</p> <p>c) appropriate governance and cost recovery arrangements for the provision of space weather information services on a global and regional basis.</p> <p>Recommendation 2/9 Implementation of a regional advisory system for select en-route hazardous meteorological conditions</p> <p>a) expeditiously develop provisions supporting the implementation of a phenomenon-based regional advisory system for select en-route hazardous meteorological conditions consistent with the evolving users' long-standing requirements, especially in those States where notable SIGMET-related deficiencies persist using, as appropriate, the strategic, governance and cost-recovery assessments provided in Appendices D and E;</p> <p>c) develop appropriate guidance material to support the selection criteria of regional hazardous weather advisory centers taking account of cost effectiveness, the processes for the preparation and dissemination of the advisory information, mutual cooperation, sustainability of the existing meteorological infrastructure and use of local expertise.</p> <p>Recommendation 3/2 Inclusion of aeronautical meteorological information in the future SWIM-enabled environment</p> <p>d) the evolution towards an information management environment should be guided by a roadmap including a transparent system of governance and risk mitigation actions and the foreseen role of existing ICAO information exchange functions for aeronautical meteorology such as regional OPMET databanks (RODB), inter-regional OPMET gateways (IROG) and internet based services.</p> <p>Recommendation 4/4 Guidance/guidelines on the recovery of costs of aeronautical meteorological service provision</p> <p>That ICAO and WMO undertake a review and, as necessary, update of the ICAO Manual on <i>Air Navigation Service Economics</i> (DOC 9161) and WMO <i>Guide on Aeronautical Meteorological Service Cost Recovery</i> (WMO Publication No. 904) so as to ensure that they appropriately reflect agreed and equitable cost recovery practices in those instances where aeronautical meteorological service provision is fulfilled on a multi-regional, regional or sub-regional (multi-State) basis.</p>

<p>ET-GOV (d)</p> <p>ET-GOV (e)</p> <p>ET-GOV (f)</p>	<p>Recommendation 4/3 Oversight of aeronautical meteorological service provision</p> <p>a) urge States to ensure that the personnel performing safety oversight functions of the aeronautical meteorological service are adequately qualified and competent meeting the requirements of Annex 19 - <i>Safety Management</i>; and</p> <p>b) develop appropriate guidance material to assist States in establishing oversight of aeronautical meteorological service provision</p> <p>Recommendation 4/2 Definition of meteorological authority</p> <p>That ICAO, in coordination with MWO, further clarify the notion of meteorological authority, through appropriate amendments to ICAO provisions and supporting guidance material.</p> <p>Recommendation 5/2 Reorganization of provisions relating to aeronautical meteorology</p> <p>a) a restructuring of Annex 3/Technical Regulations as part of amendment 78; and</p> <p>b) the development of a Procedures for Air Navigation Services - Meteorology (PANS-MET) so that a first edition be available concurrent with Amendment 78 referenced in a) above based on a roadmap (to be developed and published by ICAO) and the principles contained in Appendix E.</p>
<p>ICAO MET Panel Job Cards</p>	<p>Connection of ET-GOV with ICAO MET Panel Job Cards</p> <p>The following ICAO MET Panel Job Cards have a link with the WMO ET-GOV</p> <p>METP.003.01 Further development of the International Airways Volcano Watch (IAVW)</p> <p>METP.004.01 Inclusion of aeronautical meteorological information in the SWIM-enabled environment and further development of SWIM relating to MET</p> <p>METP.005.01 Reorganization of provisions relating to aeronautical meteorology</p> <p>METP.007.01 Implementation of a regional advisory system for select en-route hazardous MET conditions</p> <p>METP.008.01 Further development of the satellite distribution system for information relating to air navigation (SADIS)</p> <p>METP.009.01 Development of provisions for information on space weather to international air navigation</p> <p>METP.010.01 Further development of the World Area Forecast System (WAFS)</p> <p>METP.011.01 Development of cost-recovery implementation guidance and governance considerations</p> <p>Job Cards METP.003, METP.007, METP.008, METP.009 and METP.010 have a link with the overall governance principles and cost recovery of regionalized service provision as described in ET-GOV activity 3 governance issues.</p> <p>Job Card METP.004 is linked to ET-GOV activity 6 address WMO and ICAO data management and governance policies.</p> <p>Job Card METP.005 is linked to ET-GOV activity 7 coordination of evolution of WMO regulatory and guidance material on aeronautical meteorology.</p> <p>Job Card METP.011 is linked to ET-GOV activity 3 governance issues. The ICAO MET Panel Ad-hoc Working Group on Meteorological Cost Recovery Guidance and Governance (AG-MCRGG/1) deals with the development of cost-recovery implementation guidance and governance. The METP MCRGG members have attended the ET-GOV meeting in Wellington (December 2015) as invited experts, and the ET-GOV works in cooperation with the METP MCRGG.</p> <p>Members of the METP MCRGG are Peter Lechner – New Zealand, CAA (Chair), Dennis Hart – EUROCONTROL, Michael Berechree – Australia, BoM. Klaus Sturm – Germany, DWD, Christiane Givone – France, Meteo, Colin Hord – United Kingdom, CAA, Dirk Engelbart – Germany, BMVI, Kent Johnson – Canada, Env, Jan Sondij – Netherlands, KNMI.</p>

COMMUNICATION STRATEGIES				
Description	Target Audience	Delivery Method	Frequency / Date	Responsibility
Work Plan	CAeM MG, ET-GOV, aviation stakeholders	CAeM website	Annual review from March 2015	ET-GOV co-chairs
General correspondence	ET-GOV	Email	As required	ET-GOV
Team Meetings	ET-GOV	Teleconference	As required, approx. 4-monthly from March 2015	ET-GOV co-chairs
Team Meetings	ET-GOV	Face-to face meeting	Q4 2015	ET-GOV co-chairs & WMO
Team Meetings	ET-GOV	Face to face meeting	2017 TBC	ET-GOV co-chairs & WMO
Milestone Reports	CAeM MG, ICAO MET Panel, aviation stakeholders	CAeM website ICAO/WMO papers	See milestones / workplan	ET-GOV co-chairs
Final report	CAeM-16	Working paper(s) and presentation	February 2018	ET-GOV co-chairs

MILESTONES / WORKPLAN

Milestone / Activity / Task	ET TOR(s)	Accountability	Deliverables	Dates	Status (not started, ongoing, closed)
ACTIVITY 1: Monitor global landscape of aeronautical meteorological service provision					
Task 1: Monitor global landscape of aeronautical meteorological service provision. This includes organization of regulator, oversight and service provider and the various meteorological functions (AMS, AMO, MWO etc.), legislative framework, implementation of QMS, SMS and competency assessment, and cost recovery.	ET-GOV (c)	ET-GOV			
Task 1.1: Organize a first global web survey (targeted information gathering) using survey monkey in such a way that regular updates can easily be performed with limited effort.		Jan Sondij	<ul style="list-style-type: none"> - First set of questions available in survey monkey. - Target date of sending out the web based survey using updated CAeM Member list - First report on global landscape and compliancy 	February 29 th 2016 May 2016 October 2016	ongoing
Task 1.2: Provide regular updates of global landscape and compliance monitoring of aeronautical meteorological service provision using web based surveys.		ET-GOV	Regular updates of targeted information reporting.	-----	not started
ACTIVITY 2: Guidance on oversight of aeronautical meteorological service provision					
Task 2: Develop appropriate guidance material to assist States in ensuring that the personnel performing safety oversight functions of the aeronautical meteorological service are adequately competent meeting the requirements of Annex 19 - <i>Safety Management</i> .	ET-GOV (d) METDIV14 recomm 4/3				
Task 2.1: Provide a draft skeleton document for guidance and current practices with regard to qualifications of personnel performing safety oversight in the context of the ICAO Universal Safety Audit Oversight Program (USAOP).		Lead: Christiane Givone (METP MCRGG)	Provide a draft skeleton document for the guidance document	January 22 nd 2016	ongoing
		Dennis Hart (METP)	Provide information on the EUROCONTROL course for oversight staff of National Supervisory Authorities in Europe	January 22 nd 2016	ongoing
		ET-GOV METP	Provide feedback on the draft skeleton document	April 2016	not started

Task 2.2: Provide best practices with regard to qualifications of personnel performing safety oversight in the context of the ICAO Universal Safety Audit Oversight Program (USAOP)		Yuki Kato (ET-GOV) Juana Ravines (ET-GOV) Christiane Givone (METP) Andrea Henderson (ET-ETC)	Provide best practice material to be included in the document	April 2016	ongoing
Task 2.3: Prepare draft report based on input from task 2.1 and 2.2 containing current practices and guidance on the qualifications of personnel performing safety oversight.		ET-GOV with input from Andrea Henderson (ET-ETC)	Draft report.	September 2016	not started
<i>Milestone 1: Final report containing recommendations, current practices and guidance on the competencies of personnel performing safety oversight of aeronautical meteorological services.</i> The final report will be provided to ICAO METP and be published on the CAeM website. The report is also input for activity 5, the review of WMO Doc. No. 732.		ET-GOV	<i>Final report containing recommendations, current practices and guidance material on the competencies of personnel performing safety oversight of aeronautical meteorological services.</i>	November 2016	not started

ACTIVITY 3: Governance issues

Task 3: Address governance issues related to service improvements and institutional changes stemming from the meteorological components of the Global Air Navigation Plan and the Aviation System Block Upgrades, including but not limited to cost recovery (A) and the regionalization of aeronautical meteorological services (B).	ET-GOV (b) METDIV14 recomm 2/4b(iv), 2.4d, 2/7b, 2/7c, 2/9a, 2/9c, 3/2d, 4/4	ET-GOV METP Support: Christiane Givone (METP)	Meet with representatives of ICAO MET Panel to discuss governance issues, determine responsibilities and set priorities.		
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<p>Task 3.1: (A) Update information on cost-recovery models applied in different countries and regions (e.g. ASECNA) and EU (e.g. via EUMETNET AVIMET, NAMCON) and share best practices.</p> <p>Provide an update on the current best practice on cost recovery in WMO no. 904.</p>		<p>Jaakko Nuottokari (ET-GOV) Michael Berechree (METP) Ilboudo Goama (ET-GOV) Jan Sondij (ET-GOV) Dennis Hart (METP) Juana Ravines (ET-GOV)</p> <p>Klaus Sturm (METP) Chistiane Givone (METP) Olga Petrova (ET-GOV) Colin Hord (METP)</p>	<p>Draft information paper on global cost-recovery models for aeronautical meteorological service provision.</p> <p>NAMCOM Australia ASECNA EUMETNET Europe COSESNA</p> <p>Germany France Russia United Kingdom</p>	<p>May 1st 2016</p> <p>May 1st 2016</p> <p>June 1st 2016</p>	<p>ongoing</p> <p>ongoing</p>
<p>Task 3.2: (A) Provide an overview of the governance and cost recovery issues with regard to Small Island Developing States (SIDS).</p>		<p>Dimitar Ivanov (WMO) Peter Lechner (METP)</p>	<p>Information paper on governance and cost recovery issues for SIDS.</p>	<p>February 29th 2016</p>	<p>ongoing</p>
<p>Task 3.3: (A) Identify questions, among others based on task 3.1 and 3.2, relating to cost recovery and convey these to ICAO for clarification or to update the ICAO policies.</p>		<p>All</p>	<p>List with cost recovery related issues and questions sent to ICAO for clarification or to update the policy.</p>	<p>June 2016</p>	<p>not started</p>
<p>Task 3.4: (A) Prepare a draft report on cost recovery issues, proposals and existing practices based on the output of task 3.1, 3.2 and task 3.3.</p>		<p>Jan Sondij (ET-GOV) Support ET-GOV and METP</p>	<p>Draft report on cost recovery issues, proposals and existing practices.</p>	<p>April 2017</p>	<p>not started</p>
<p>Task 3.5 (B) Study existing models on regionalization of services including ASECNA and NAMCON and other forms of international cooperation e.g. MET Alliance in Europe and service provision in European Functional Airspace Blocks.</p>		<p>Lead: Kent Johnson (ET-GOV) Support: ET-GOV</p>	<p>Draft information paper on existing models on regionalization of aeronautical meteorological service provision, providing a MET Service provider view on governance and regionalization.</p>	<p>February 2017</p>	<p>not started</p>

Task 3.6: (B) Examine different levels of regionalization (forecasting) within larger countries such as Canada, China, the Russian Federation and USA.		Lead: Kent Johnson (ET-GOV) Support: Olga Petrova (ET-GOV) Feng Zhang (ET-GOV) Kent Johnson (ET-GOV) Olga Petrova (ET-GOV) Feng Zhang (ET-GOV)	Draft paper on regionalization (forecasting) within larger countries of aeronautical meteorological service provision. USA and Canada Russia China	November 2016	ongoing
Task 3.7: (B) Develop summary paper on regionalization of aeronautical meteorological service provision including cost recovery		Kent Johnson Support ET-GOV	Draft paper on regionalization of aeronautical meteorological service provision.	to be determined	not started
<i>Milestone 2: Final report containing best practice and guidance, and proposed amendments to WMO documentation, on governance of aeronautical meteorological service provision in line with ICAO GANP and ASBU developments.</i>		<i>ICAO MET Panel with support from ET-GOV</i>	<i>Final report containing best practice and guidance, and proposed amendments to ICAO and WMO documentation, on governance of aeronautical meteorological service provision in line with ICAO GANP and ASBU developments.</i>	<i>to be determined</i>	<i>not started</i>
<i>Milestone 3: Update of WMO publication 904 - Guide on aeronautical meteorological services cost recovery - Principles and guidance</i>		<i>TBD</i>	<i>Update of WMO 904 - Guide on aeronautical meteorological services cost recovery - Principles and guidance</i>	<i>November 2017</i>	
ACTIVITY 4: Guidance on roles and responsibilities of meteorological authorities and meteorological service providers					
Task 4: Share examples and assist Members in establishing optimal governance at national level with regard to meteorological authorities and meteorological service providers and their roles and responsibility, and provide inputs to ICAO in developing guidance material.	ET-GOV (d) METDIV14 recomm 4/2, 5/2				
Task 4.1: Prepare a skeleton for a guidance document that provides information on these roles and responsibilities and related topics, seen from an NMHS perspective. Included will be links to various documents where these functions are addressed, legislative framework, the relationship with cost recovering the services, and various service delivery models including cross border service provision and the link with commercial service providers. Included in the document will be a number of national and regional good practices.		Lead: Christiane Givone (METP MCRGG) Support : ET-GOV ET-GOV METP	Provide a draft skeleton document for the guidance document Provide feedback on skeleton	March 2016 August 2016	ongoing not started

Task 4.2: To provide best practices, including legislative framework, to be included in the document.		Dennis Hart (METP) Peter Lechner (METP) Ilboudo Goama (ET-GOV) Kent Johnson (ET-GOV) Juana Ravines (ET-GOV) Feng Zhang (ET-GOV) Yuki Kato (ET-GOV)	Best practices for inclusion in the document EU situation South-west Pacific ASECNA USA and Canada Peru China Japan	April 2016	on going
Task 4.3: Prepare draft report based on input from task 4.1 and 4,2 containing best practices and optimal governance at national level with regard to meteorological authorities and meteorological service providers and their roles and responsibility .		Christiane Givone (METP) with support of ET-GOV	Draft report	August 2016	not started
<i>Milestone 4: Final report containing guidance on the roles and responsibilities of meteorological authorities and meteorological service providers.</i> The final report will be provided to ICAO METP and be published on the CAeM website.		ET-GOV	<i>Final report containing current practices and guidance on the roles and responsibilities of meteorological authorities and meteorological service providers – as an input to relevant ICAO and WNO regulatory and guidance material</i>	December 2016	not started
ACTIVITY 5: Review of WMO Doc. No. 732, Guide to practices for meteorological offices serving aviation					
Task 5: Conduct a review of WMO Doc. No. 732 , Guide to practices for meteorological offices serving aviation and consider the possibility to use this document for publication of the output of the ET GOV in the form of guidance material. The WMO Doc. No. 732 will be complementary material to ICAO Doc. No. 8896 Manual of Aeronautical Meteorological Practice.	ET-GOV (a)	ET-GOV + contracted expert			
Task 5.1: Perform a first review of the WMO Doc. No. 732 Guide to practices for meteorological offices serving aviation and provide a revised draft skeleton. The review will consider the name of the document, a possible merge with WMO Doc 731, the current situation on data policies, and input of ET-ETC on training and competence.		Lead: Jaakko Nuottokari Support: Juana Ravines (ET-GOV) Christiane Givone (METP) Chris Webster (ET-ETC)	Revised draft skeleton for WMO Doc. No. 732	February 29 th 2016	ongoing
Task 5.2: Decide on document structure and select contractor for drafting updated document.		ET-GOV ET-ETC WMO	Agreed upon skeleton of updated document and contract awarded to expert in charge of revision, due date February 2017.	June 2016	not started

Task 5.3: Review updated WMO Doc 732.		ET-GOV ET-ETC	Final review of updated WMO Doc 732	May 2017	not started
<i>Milestone 5: Publication of revised WMO Doc. No. 732.</i>		Dimitar Ivanov (WMO)	Publication of revised WMO Doc. No. 732	August 2017	not started
ACTIVITY 6: Address WMO and ICAO data management and governance policies					
Task 7: To address relevant WMO and ICAO data management and governance policies in consultation with the ICAO METP and relevant WMO bodies; Currently no formal task of ET-GOV awaiting the outcome of SWIM developments, and the WMO task team on data policies. Take note that SWIM does not mean that data will be available for free to the public.	ET-GOV (c)	ET-GOV co-chairs	No deliverables determined yet	-----	not started
ACTIVITY 7: Coordination of evolution of WMO regulatory and guidance material on aeronautical meteorology					
Task 7: To coordinate on the evolution of the WMO regulatory material on aeronautical meteorological service provision in line with ICAO plans for restructuring Annex 3, and review/update/consolidate existing service delivery guidance material.	ET-GOV (e,f)				
Task 7.1: Provide a first draft of existing ICAO and WMO regulatory material and a proposal to review/update/consolidate this material.		ET-GOV co-chairs Lead: Jan Sondij Support: Kent Johnson	First draft of existing ICAO and WMO regulatory material and a proposal to review/update/consolidate this material.	October 2016	ongoing
Task 7.2: Provide a draft proposal on ICAO and WMO regulatory material on aeronautical meteorological service provision.		ET-GOV co-chairs	Draft proposal on ICAO and WMO regulatory material on aeronautical meteorological service provision.	September 2017	not started
<i>Milestone 6: Final report providing proposal on WMO and ICAO regulatory material on aeronautical meteorological service provision.</i> The final report will be put on the agenda for CAeM 16 in April 2018 and the WMO Congress 18 in 2019.		ET-GOV co-chairs	Final report providing proposal on WMO and ICAO regulatory material on aeronautical meteorological service provision.	October 2017	not started
ACTIVITY 8: Reporting on progress of WMO CAeM ET-GOV					
Task 8: To report regularly on progress to the president of the Commission via annual progress reports and updated work plan.	ET-GOV (g)	ET-GOV co-chairs			

<i>Milestone 7: Provide annual progress report and updated work plan 2015</i>		<i>ET-GOV co-chairs</i>	<i>Progress report and updated work plan</i> <ul style="list-style-type: none"> - <i>Report of Wellington meeting</i> - <i>Updated ET-GOV work plan v0.6</i> - <i>Powerpoint for MG WebEx December 2015</i> 	<i>December 2015</i>	<i>closed</i>
<i>Milestone 8: Provide annual progress report and updated work plan 2016</i>		<i>ET-GOV co-chairs</i>	<i>Progress report and updated work plan</i>	<i>December 2016</i>	<i>not started</i>
<i>Milestone 9: Provide annual progress report and updated work plan 2017</i>		<i>ET-GOV co-chairs</i>	<i>Progress report and updated work plan</i>	<i>December 2017</i>	<i>not started</i>
<i>Milestone 10: Provide final report and presentation for CAeM16,</i>		<i>All, ET-GOV co-chairs</i>	<i>Final report and presentation for CAeM16</i>	<i>February 2018</i>	<i>not started</i>

ACTION LIST

Agreed by ET-ETC/ET-GOV meeting – December 2015

No.	Ag. Item	Action	Responsibility	Deliverables	Deadline	Status	Note
1	2.3.3	ET-ETC and ET-GOV to ensure that the AeM as priority in the WMO Strategic Plan (2016-2019) is reflected in the ET work plans	ET Co-chairs	Revised work plans	immediate		
2	3.2	ET-GOV to address the impact of the restructuring of Annex 3 on related WMO publications	Jan	Task in the work plan	immediate		
3	4.2.1	Clarify the situation with the co-chair of ET-ETC – request NWS to advise about replacement of Pat Murphy	Ian Lisk	Nomination of a Co-chair of ET-ETC	immediate		
4	5.1.2	Circulate the appendix to Andrea's document to the RTCs and the ETR Focal Points for information	Jeff	Letter	Feb 2016		
5	5.1.3	Replace the text related to the footnote in the performance criteria C5.2 regarding English language proficiency	Jeff	Update document	Feb 2016		
6	5.1.4	Request information from Members' training institutes on what assistance and guidance they would like to see from the team	Jeff, Chris	Survey	Jun 2016		
7	5.1.5	Check with "Queenie" Lam for details of the usage of the HKO mapping website in terms of numbers; decide on review frequency	Chris	Information to ET-ETC	Mar 2016		
8	5.1.6	Provide first draft of Competency Management Guide	Andrea	Draft guide	Feb 2016		
9	5.1.7	Finalize and provide the document "Competence Management Systems as part of an overarching QMS"; post on AeMP website	Paul Dimitar	Guidance material online	Jan 2016 – final draft		
10	5.1.8	Raise the issue of finding the suitable place holders for different competency material at the session of the EC ETR Panel	Chris	Doc for ETR Panel meeting	March 2016		

11	5.1.14	Request PTC-2016 meeting to define a task on systematic maintenance of WMO publications related to AeMP	Ian	Discussion item for PTC-2016	Jan 2016		
12	5.1.15	Request ICAO to update Annex 1 and Annex 3 references related to competency	Dimitar	Formal request to ICAO	Feb 2016		
13	5.1.16	Update the moodle website	Raf	Updated website	Feb 2016		
14	5.1.19	Members be reminded of the 1 Dec 2016 deadline for qualification on AMF; provide updated flow charts	Jeff, Dimitar	Circular letter	Jan 2016		
15	5.1.21	Update the FAQs for the BIP-M compliance	Chris	Updated FAQ document	Jan 2016	completed	
16	5.1.22	Provide support to ad-hoc enquiries by Members on AMF qualification requirements	Kathy-Ann	Expert advice	2016+		
17	5.2.2	Advise on the possibility of using Google Docs for collaborative work on documents	Dimitar	Inform ETs	Jan 2016		
18	5.2.2	Organize ET-GOV WebEx in April 2016	Jan	Doodle poll	Mar 2016		
19	5.2.5	Advice on the use of SurveyMonkey as a tool for online surveys	Dimitar	Inform ET-ET-GOV Co-chairs	Jan 2016		
20	5.2.6	Prepare draft outline of the global survey questionnaire and provide to ET members for comments	Jan	Draft Survey Questionnaire	Feb 2016		
21	5.2.8	Coordinate with ET-CCP and Secretariat to provide an updated list of CAeM members	Jan Dimitar	Updated list of CAeM members	Mar 2016		
22	5.2.8	Request ICAO to provide information available about WMO Members States through the USAOP	Dimitar	Request ICAO HQ about the possibility to share this information	Feb 2016		
23	5.2.12	Contribute to the development of guidance material on the competency of aviation MET service oversight personnel:	Christiane	Draft guidance material for consideration by ICAO METP and in the new WMO-No.732	Sept 2016		
		1. Share information on the course that is provided by EUROCONTROL	Dennis		Feb 2016		
		2. Provide the BoM draft material	Michael B.		Feb 2016		

		3. Examples of national practices	Yuki, Juana, Christiane, Dennis		Apr 2016		
24	5.2.14	A paper on specific issues for Small Island Development States (SIDS)	Peter Lechner, Dimitar, Michael	Paper submitted to ET-GOV to inform future actions	Apr 2016		
25	5.2.18	Draft information paper on different cost-recovery models for aeronautical meteorological service provision	Jan with inputs from: Jaakko, Ilboudo, Dennis, Juana, Michael, Yuki, Kent	Information paper in support of updating relevant WMO docs (904, 732) and METP work	Dec 2016		
26	5.2.19	Inputs on regionalization of services and related cost-recovery	Kent with inputs from: Dennis, Feng Zhang, Olga Petrova, Ilboudo, Juana, Jaakko	Good practices collection for inclusion in guidance material	Nov 2016		
27	5.2.20	Update to the existing good practice examples on cost-recovery in WMO-No. 904	ET-GOV Co-chairs with inputs from: Klaus, Christiane, Olga, Colin Hord	National good practices for inclusion in the next edition of WMO-No.904	Jun 2016		
28	5.2.24	Draft guidance on roles and responsibilities of meteorological authorities and meteorological service providers	Christiane (lead)	first draft outline of the document	Apr 2016		
			Dennis: EU situation; Peter: Australia and New Zealand; Ilboudo: ASECNA; Kent: USA/Canada; Juana: Peru; Feng Zhang: China; Yuki: Japan	Good practices (including legal instruments)	Apr 2016		
			All	Inputs and comments for finalizing the draft	Aug 2016		
29	5.2.26	Review of WMO-No.732 – first draft	Jaakko	Draft outline of the revised document	Feb 2016		

			All	Inputs and comments	Jun 2016		
30	5.2.27	Review of WMO-No.732 – final draft	ET-GOV Co-chairs, Dimitar; consultant	Draft No.732	Aug 2017		
31	5.2.43	Proposal for restructured WMO regulatory and guidance documentation	Jan (lead) with support from Kent, in coordination with Michael (leader of METP WG-MRI WS on restructuring of Annex 3	Analysis document for review by MG and submission to CAeM-16 (Jul 2018), and Cg-18 (2019)	Oct 2017		
32	8.1	Contact the WAFs regarding providing WAFS resource material to support the second level competencies for the AMF	Dimitar	Inputs to WMO competency guidance	May 2016		