



INTERNATIONAL CIVIL AVIATION ORGANIZATION

**AFI PLANNING AND IMPLEMENTATION REGIONAL GROUP
TWENTIETH MEETING (APIRG/20)**

Yamoussoukro, Côte d'Ivoire, 30 November – 2 December 2015

Agenda Item 2.6: Aeronautical Meteorology (MET)

**REVIEW OF THE REPORT OF THE TWELFTH
MEETING OF THE METEOROLOGY SUB-GROUP (MET/SG/12)**

(Presented by Secretariat)

SUMMARY

This paper presents the report of the Twelfth Meeting of the MET/SG (MET/SG/12). The Sub-Group reviewed:

- ✓ the action taken on various MET related conclusions and decisions of APIRG
- ✓ the Status of implementation of the work programmes of the MET Sub-group and related task forces;
- ✓ the outcomes of APIRG Extraordinary Meeting and the 2014 Meteorology Divisional Meeting;
- ✓ the linkage of remaining tasks of the MET/SG with Aviation System Block Upgrades (ASBU) Modules B0 and Regional Performance objectives for MET;
- ✓ the New Structure of the AFI regional air navigation plan (AFI ANP) and development of draft material for endorsement by APIRG.

The MET/SG/12 meeting also identified and developed Projects based on ASBU B0-AMET and Regional Performance objectives

Action by the meeting is **at paragraph 3.**

REFERENCE(S):

- | | |
|--------------------|--------------------------|
| - APIRG/19 Report | - WAFSOPSG/8 Report |
| - APIRG/EO | - SADISOPSG/19 Report |
| - MET/14 | - AFI OPMET MTF/5 Report |
| - MET/SG/12 Report | - ATM-MET/TF/1e |

Strategic Objective(s)

This working paper related to the Strategic Objectives safety, air navigation capacity and efficiency.

1. INTRODUCTION

1.1 The Twelfth Meeting of the Meteorology Sub-Group (MET/SG/12) was held at the premises of the ICAO Western and Central African Office (WACAF), Dakar, Senegal, from 1 to 5 December 2014. The meeting was attended by forty-four (44) participants from seventeen (17) States including three international/regional organizations.

1.2 The MET/SG/10 was chaired by Ms. G.E. Khambule, Senior Manager, Aviation Weather Centre, South African Weather Service.

2. DISCUSSION

2.1 The following issues were given particular attention by the MET Sub-Group.

Status of implementation of the MET/SG work programme

2.2 Under this Agenda item, the MET/SG meeting recalled that Decision EO/03 of APIRG Extraordinary meeting (APIRG/EO) called for the APIRG contributory bodies including the MET/SG to “*continue to implement the work programmes as previously endorsed by APIRG; and carry out necessary action to facilitate the operationalization of the new organizational structure and working methods of the APIRG, including reformulation of existing activities that continue to have relevance, into the projects management formats, to be presented for endorsement by the next meeting of the Group.*” The Sub-group therefore, reviewed the status of implementation of its work programmes and associated Task Forces as provided in the MET/SG/12 report, including:

- ✓ the status of implementation of the AFI OPMET Management Task Force (MTF) work Programme,
- ✓ the status of implementation of the tasks and Terms of reference of the Air Traffic Management and Meteorology Task Force (ATM/MET/TF);
- ✓ Summary of recent and forthcoming developments to the WAFS and SADIS;
- ✓ air navigation deficiencies in the MET field;
- ✓ the status of implementation of APIRG/19 Decisions and Conclusions related to MET; and
- ✓ the status of implementation of the Meteorological Sub-Group (MET/SG) work programme.

2.3 On the basis of the reviewed air navigation deficiencies in the MET field, the summary of recent and forthcoming developments to the WAFS and SADIS, the status of implementation of the Decisions/Conclusions and work programmes of the MET/SG, MTF and ATM/MET/TF, the Sub-group prepared a status of implementation of its work programme given in **Appendix 10A** to this paper.. In this regard, the MET/SG formulated the following draft Decision:

DRAFT DECISION 20/XX: STATUS OF IMPLEMENTATION OF THE MET/SG WORK PROGRAMME

That, the information given in Appendix 10A to this working paper, is endorsed as the Status of Implementation of the Work Programme of the AFI Meteorological Sub-Group (MET/SG) to be considered in the work programme of the new APIRG Infrastructure and Information Management Sub-group (IIM/SG).

Linkage of remaining tasks of the MET/SG with Aviation System Block Upgrades (ASBU) Modules B0 and Regional Performance objectives for MET

2.4 The MET/SG meeting noted that APIRG/19 meeting adopted the Air Navigation System Implementation Action Plan for the Africa and Indian-ocean (AFI) region, which establishes the prioritization of Aviation System Block Upgrades (ASBU) Block0 Modules, proposes the Air Navigation Report Forms (ANRFs) and defines the performance-based planning framework for the AFI region.

2.5 The Sub-group meeting reviewed the ANRF related to B0-AMET in the AFI Air Navigation System Implementation Action Plan, as indicated in **Appendix 10B** to this working paper, based on ASBU module B0-AMET elements (GANP, Doc 9750) and on the remaining tasks of the MET/SG. In this regard, the MET/SG formulated the following draft conclusion:

DRAFT CONCLUSION 20/:XX AFI AIR NAVIGATION REPORT FORM (ANRF) FOR B0-AMET MODULE

That, the information given in Appendix 10B to this working paper, is endorsed as the updated Air Navigation Report Form (ANRF) for ASBU B0-AMET module in the AFI region.

Relationship between MET related AFI PFFs and ASBU B0-AMET

2.6 The Sub-group meeting noted that ASBU module Block0-AMET (B0-AMET) is defined in the GANP (Doc 9750) as a Global, regional and local meteorological information provided by world area forecast centres, volcanic ash advisory centres, tropical cyclone advisory centres, aerodrome meteorological offices and meteorological watch offices in support of flexible airspace management, improved situational awareness and collaborative decision-making and dynamically optimized flight trajectory planning. The MET/SG further noted that aeronautical meteorology (MET) is a thread running through ASBU performance improvement area titled “Globally Interoperable Systems and Data” and that, through future system-wide information management (SWIM), MET information would be a key enabler to the realization of a globally harmonized, interoperable air traffic management system. Therefore, Recommendation 1/1 of MET/14 approved by ICAO Air Navigation Commission (ANC), called for updating the GANP and ASBU methodology to reflect ASBU MET module dependencies on other modules.

2.7 Based on available information provided in the MET/SG12 report, the MET/SG developed an amendment proposal to Appendix C of the Air Navigation System Implementation Action Plan adopted by APIRG/19 meeting, as provided in **Appendix 2.6C** to this paper. In this regard, the Sub-group formulated the following draft decision:

DRAFT DECISION 20/XX: AMENDMENT TO THE AFI AIR NAVIGATION SYSTEM IMPLEMENTATION ACTION PLAN, APPENDIX C

That the AFI Air Navigation System Implementation Action Plan, Appendix C be amended as proposed in Appendix 10C to this paper.

2.8 The Sub-group was presented with the status of implementation of the B0-AMET module by ASECNA States and proposed actions for further implementation, and commended ASECNA and its member States for ongoing actions in the implementation of the ASBU module B0- AMET in accordance with the AFI air navigation system implementation Action Plan.

Review of the New Structure of the AFI Regional Air Navigation Plan (AFI ANP) and Development of Draft Material for endorsement by APIRG.

2.9 The Sub-group reviewed the new Air Navigation Plan structure and developed relevant draft material for endorsement by the APIRG to be discussed under Agenda item 3 of this meeting.

Identification and development of MET related APIRG Projects

2.10 The Sub-Group reviewed the work implicated in the ASBU Block 0 Modules and Regional Performance Objectives adopted by APIRG at its Nineteenth meeting in 2013, as well as its remaining tasks, and agreed on a list of Projects related to the mandate of the IIM/SG to be discussed under Agenda item 4 of this meeting.

Review of the Outcome of the 2014 Meteorology Divisional Meeting (Montréal, Canada, 7 – 18 July 2014)

2.11 Under this Agenda item, the Sub-Group was informed of the outcome of the Meteorology (MET) Divisional Meeting in 2014 (MET/14), was conjointly held with the 15th Session of the World Meteorological Organization (WMO) Commission for Aeronautical Meteorology (CAeM). The report of MET/14 is available on the ICAO secure website.

2.12 The Sub-group noted that the MET/14 meeting recommended ICAO to urge States to ensure that the personnel performing safety oversight functions of the aeronautical meteorological service are adequately qualified and competent, thus meeting the requirements of Annex 19, and to develop appropriate guidance material to assist States with regard to the oversight of aeronautical meteorological service provision. In this regard, the MET/SG meeting formulated the following draft conclusion.

**DRAFT CONCLUSION 20/XX: QUALIFICATION OF PERSONNEL PERFORMING SAFETY
OVERSIGHT FUNCTIONS OF THE AERONAUTICAL
METEOROLOGICAL SERVICE**

That, personnel performing safety oversight functions of the aeronautical meteorological service in the AFI region, is adequately qualified and competent as stipulated in Annex 19 to the Chicago convention.

2.13 To allow a greater involvement of the AFI region in the activities of future expert groups proposed by the MET/14, the MET/SG meeting formulated the following draft Conclusion:

**DRAFT CONCLUSION 20/XX: PARTICIPATION IN THE ACTIVITIES OF THE
FUTURE EXPERT GROUP ON THE
IMPLEMENTATION OF MET RELATED SWIM
ACTIVITIES**

That, AFI States be encouraged to participate in the activities of the future Expert Group on the implementation of the system wide information management (SWIM) in the MET field.

2.14 The ICAO Council, at the fourth meeting of its 203rd Session on 3 November 2014, and the Air Navigation Commission at the seventh meeting of its 197th Session on 30 September 2014, under authority delegated by the Council, took action on the recommendations of the Meteorology Divisional Meeting (2014) (MET/14), by allocating a follow-up responsibility to the ICAO Secretariat for all 29 recommendations of the MET/14 meeting, except Recommendation 5/1 for which the Council agreed that it would be transmitted to Contracting States and relevant international organizations for any comments, together with the Commission's comments and proposals thereon. Following receipt of these comments, a further review will be conducted by the Commission, which will then present its final proposals to the Council for adoption of amendments to Annex 3 — *Meteorological Service for International Air Navigation*, Annex 11 — *Air Traffic Services*, the *Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM, Doc 4444) and the *Procedures for Air Navigation Services — ICAO Abbreviations and Codes* (PANS-ABC, Doc 8400).

Summary of recent and forthcoming developments to the WAFS and SADIS

2.15 The WAFC London Provider State (UK) presented the MET/SG meeting with developments to the WAFS since the MET/SG/11 meeting (8-10 July 2013, Nairobi, Kenya). The Sub-group noted that the World Area Forecast Operations Group (WAFSOPSG) held its 8th meeting from 2 to 5 September 2013 the report of which is available through the following link: <http://www.icao.int/safety/meteorology/WAFSOPSG/Pages/default.aspx>

2.16 The MET/SG noted that the WAFCs had produced a training module regarding the use of WAFS gridded CB, icing and turbulence forecasts. This guidance was provided via the internet with an English language voiceover. In addition, ICAO had provided PDF versions of the training module with the text translated into Arabic, Chinese, English, French, Russian and Spanish languages. The training module and the related PDFs are supplemental to the existing guidance material 'Guidance on the Harmonized WAFS Grids for Cumulonimbus Cloud, Icing and Turbulence Forecasts' which is available at: <http://www.icao.int/safety/meteorology/WAFSOPSG/Pages/GuidanceMaterial.aspx>.

2.17 The MET/SG meeting learned with appreciation that, in response to Conclusion 16/49 of APIRG 16 meeting, a training workshop on the above mentioned guidance, was provided by ICAO regional office, Dakar, with advice from the WAFC London, to French speaking AFI States from 21 to 23 April 2014, in Niamey, under the kind invitation of the Republic of Niger.

2.18 The MET/SG meeting noted that WAFC London had made available (from 8th July 2014) verification data for WAFS GRIB2 CAT and CB. The information can be obtained from the "WAFC London Performance Indicators" webpage: <http://www.metoffice.gov.uk/aviation/responsibilities/icao>. The meeting was advised that the verification data should be used in conjunction with the guidance material mentioned above. The MET/SG meeting encouraged AFI States to obtain verification of WAFS data.

2.19 With regard to the recent and forthcoming developments to the SADIS and WAFS summarized above, the MET/SG meeting formulated the following draft Conclusion:

DRAFT CONCLUSION 20/XX: ACTION BY AFI STATES TO PREPARE FOR RECENT SADIS AND WAFS DEVELOPMENTS

That,

- a) AFI States are encouraged to regularly obtain information on the verification of WAFC London GRIB2 CAT and CB forecast data;**
- b) SADIS Users in the AFI region,**

- 1) **To contact their SADIS Workstation software provider to seek information regarding future updates and to take advantage of the enhancements including the provision of traditional alphanumeric OPMET data at 1 minute intervals.**
- 2) **are encouraged to establish and regularly test backup accounts with WAFC Washington, to be used in the event that their normal service in accordance with the AFI ANP, is not available.**

Air navigation deficiencies in the MET field

2.20 The MET/SG meeting recalled that the list of deficiencies in the MET field had been reviewed and updated based on the uniform methodology approved by the ICAO Council for identification, assessing, tracking and reporting of deficiencies of air navigation systems. In analysing the updated list of deficiencies, the Sub-Group observed the following:

- a) The deficiencies in the MET field, were identified in only 24 States visited;
- b) Lack of certified **QMS** in 23 States/24 (Angola, Burundi, Cape Verde, Chad, Cameroon, Congo, Djibouti, Gambia, Ghana, Guinea, Guinea Bissau, Lesotho, Liberia, Mauritania, Niger, DRC, Sao Tome and Principe, Senegal, Sierra Leone, Somalia, Togo and Zambia);
- c) Lack of use of quality WAFS products (no **SADIS** station) in 5 States/24 (Djibouti, Liberia, Nigeria (Kano), Sao Tome and Principe and Sierra Leone);
- d) Lack of issuance of aerodrome forecasts (**TAF**) in 3 States/24 (Angola, Burundi and Sao Tomé and Principe);
- e) Lack of issuance of aerodrome warnings (**AD WRND**) in 4 States/24 (Djibouti (Djibouti), Guinea (Conakry), DRC (Kinshasa) and Sao Tome and Principe (Sao Tome));
- f) Lack of issuance of wind shear warnings and alerts (**WS WRND**) while experienced by aircraft in 4 States/24 (Djibouti (Djibouti), Guinea (Conakry), DRC (Kinshasa) and Sao Tome and Principe (Sao Tome)).

2.21 The MET/SG meeting was apprised on developments with regard to implementation of QMS for MET service (QMS/MET) and was pleased to note that aerodromes of 17 ASECNA Member States under the Agency's responsibility including that of the States listed under item b) above had been certified. Regarding issuance of TAF, Dakar RODB informed the meeting that TAF were being received from the States listed under item d) above. The MET/SG meeting then agreed that ASECNA and the concerned States should confirm the QMS certification and issuance of TAF respectively through letters to ICAO to enable updating the list of deficiencies accordingly.

2.22 In addition, the Sub-group meeting noted the following MET deficiencies collected from the reports of the annual SIGMET tests and from other sources:

- a) Lack of issuance of **SIGMET**: 6 MWOs/28 have never issued any SIGMET during AFI SIGMET Tests: (Angola (Luanda), Ethiopia (Addis Ababa), Namibia (Windhoek), Tanzania (Dar Es Salaam), Zambia (Lusaka) and Zimbabwe (Harare) – *Source: 2013 SIGMET TEST report*);

- b) AFI Meteorological Bulletins Exchange (**AMBEX**) scheme not fully implemented (Availability of AFI METAR and TAF at Dakar RODB during 3rd quarter of 2014): TAF – 79,51% (ESAF – 76,13% and WACAF – 82,88%), METAR – 51,66% (ESAF – 48,05% and WACAF – 55,27%); *source: DAKAR RODB OPMET monitoring on 30 September 2014*;
- c) **ATIS** not implemented: 0/17 (Angola, Cameroon, Congo, Côte d’Ivoire, Gabon, Ghana, Guinea, Kenya, Madagascar, Nigeria, Uganda, Senegal, Tanzania, Zambia and Zimbabwe); *Source: AFI ANP Table AOP/1*
- d) Lack of implementation of **HF VOLMET**: 0/2 (Congo and Madagascar). *Source: AFI ANP Table ATS/2*.

2.23 Regarding item b) above, the meeting agreed that statistics on availability of OPMET data should be presented using the following thresholds: “above 97%, between 50% and 97% and below 50%”. The meeting noted that Dakar RODB does not make distinction in the statistics between the exchange of amended TAF and regular TAF and also between AOP aerodromes and non-AOP aerodromes. The MET/SG meeting then suggested that RODB Dakar corrects its software accordingly.

2.24 The MET/SG agreed that all remaining AFI States should be visited to update the list of air navigation deficiencies in the MET field, and that the States with such deficiencies should endeavor to get them removed through establishing corrective action plans. The Sub-group then formulated the following Draft Conclusion:

DRAFT CONCLUSION 20/XX: ACTION PLAN TO REMOVE AIR NAVIGATION DEFICIENCIES IN THE MET FIELD

That,

- a) **ICAO Regional Offices in Dakar and Nairobi, update the air navigation deficiencies in the MET field in the remaining non-visited AFI States;**
- b) **AFI States where deficiencies still persist, endeavour to establish and implement an action plan aims at removing air navigation deficiencies in the MET field; and**
- c) **AFI RODBs present statistics on availability of OPMET data, using the following thresholds: “above 97% availability, between 50% and 97% availability and below 50% availability”.**

Status of implementation of APIRG/19 Decisions and Conclusions related to MET

2.25 The MET/SG meeting recalled that its updated work programme was endorsed by the APIRG/19 meeting through Decision 19/46. The meeting further recalled that the MET/SG/11 formulated decisions which are contained in the final report available through the following link [http://www.icao.int/WACAF/Pages/METEOROLOGY-SUB-GROUP-TENTH-MEETING-\(MET-SG-11\).aspx](http://www.icao.int/WACAF/Pages/METEOROLOGY-SUB-GROUP-TENTH-MEETING-(MET-SG-11).aspx). The Sub-group further recalled that APIRG/19 meeting formulated MET related four (4) Conclusions and two (2) Decisions. The MET/SG meeting reviewed the status of implementation of the MET related APIRG/19 Conclusions and Decisions, MTF/5, ATM/MET/TF/1 and MET/SG/11 Decisions listed in **Appendixes 10D** to this working paper.

2.26 In reviewing **Appendix 10D**, the MET/SG recalled that APIRG/19 meeting agreed that the AFI transition plan for table-driven data representation (XML/GML) should be developed after the MET Divisional meeting scheduled for July 2014. The meeting noted that the MET/14 proposed a global transition plan for table-driven data representation (XML/GML) for METAR/SPECI, TAF and SIGMET as given in **Appendix 10E** to this working paper. The meeting further recalled that Conclusion 19/44 of APIRG/19 called for the development of capabilities of handling OPMET information in digital format by inviting Dakar and Pretoria RODBs to:

- “a) start developing capability of handling OPMET data in digital format as soon as possible, after November 2013;*
- b) test the codes based on OPMET data in digital format (XML/GML) for METAR/SPECI, TAF and SIGMET with a view to fine tuning over the first year (2014); and*
- c) take a leading role over the transition aspect to XML/GML and provide technical assistance as required to other AFI States in implementing OPMET data in digital format.”*

2.27 In this regard, the MET/SG agreed to submit to APIRG/20, the proposed transition plan for the table-driven data representation (XML/GML) in the AFI region given at **Appendix 10F** to this working paper. The Sub-group consequently formulated the following draft Conclusion:

DRAFT CONCLUSION 20/XX: TRANSITION PLAN FOR HANDLING OPMET INFORMATION IN DIGITAL FORMAT IN THE AFI REGION

That, the information given in Appendix 10F to this working paper, is endorsed as the Transition Plan for handling OPMET Information in Digital Format in the AFI region.

2.28 For a better understanding and involvement of AFI States in the implementation of the transition plan, the MET/SG meeting agreed that AFI States would need to develop capability of handling OPMET data in digital format. In this regard, the meeting agreed that it would be desirable to conduct training for the personnel of the AMBEX units in the region, thus the MET/SG formulated the following draft conclusion:

DRAFT CONCLUSION 20/XX: TRAINING SEMINARS TO DEVELOP CAPABILITY BUILDING FOR HANDLING OPMET DATA IN DIGITAL FORMAT IN THE AFI REGION

That the WMO, in coordination with ICAO, assist AFI States in implementing OPMET Information exchange in Digital format by conducting regional training seminars and workshops in view of:

- a) increasing awareness of users of the AFI Meteorological Bulletin Exchange (AMBEX) units, in the exchange of OPMET data in digital format; and**
- b) expediting the implementation of the AFI Transition Plan for handling OPMET Information in Digital Format.**

2.29 The MET/SG recalled that Decisions 11/04 and 11/06 of the MET/SG/11 meeting, called for the updating of the AFI regional SIGMET Guide and AMBEX Handbook, respectively by the Secretariat.

2.30 The MET/SG meeting noted that on the basis of a regional SIGMET Guide template developed by ICAO HQ, the Secretariat further developed a new edition of the AFI regional SIGMET Guide given in **Appendix 10G** to this working paper. The Sub-group reviewed and updated the new edition. The AMBEX

Handbook given in **Appendix 10H** was also amended by the Secretariat as called for by Decision 11/06 of MET/SG/11. In addition, the MET/SG noted that during the AMBEX implementation training workshop conducted in Dakar, from 18 to 20 March 2014, the workshop suggested to add the communications main flow chart and the AFI routing Tables to the AMBEX Handbook. Furthermore, the MET/SG meeting was presented with a proposal to include OPMET bulletins exchange programs of the National OPMET Centres (NOC) in the AMBEX Handbook.

2.31 In this regard, the MET/SG meeting reviewed and agreed to submit to the APIRG/20 meeting both the draft amendments of the AFI SIGMET Guide and the AMBEX Handbook presented in **Appendixes 10G and 2.6H** to this working paper respectively. The meeting then formulated the following draft decision:

DRAFT DECISION 20/XX: UPDATING THE AFI REGIONAL SIGMET GUIDE AND AMBEX HANDBOOK

That:

- a) **Appendix 10G to this working paper, is endorsed as the 10th edition of the AFI regional SIGMET Guide; and**
- b) **Appendix 10H to this working paper, is endorsed as the updated AMBEX Handbook, 7th Edition – Amendment 4.**

Any other business

2.32 The MET/SG meeting recalled of activities of the Cooperative Development of aeronautical meteorology Programme in the AFI region (CODEVMET-AFI). CODEVMET-AFI is a cost sharing programme that aims at enhancing AFI States capability in carrying out safety oversight functions of the aeronautical meteorology service providers, and providing, on request, trainings that would assist States to achieve compliance with relevant aviation safety standards.

2.33 The Sub-group was informed and appreciated that the East African School of Aviation (EASA) in Nairobi, Kenya had introduced a MET inspectors course in its programme.

2.34 The meeting was briefed on the WMO Aircraft Meteorological Data Relay (AMDAR) Regional Implementation Programme for Africa.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information provided in this paper; and
- b) decide on the above draft Conclusions and draft Decisions proposed for the Group's consideration.
