International Civil Aviation Organization

WORKING PAPER

Twenty-fifth Meeting of the Meteorology Sub-group (MET SG/25)

Online, 18 – 22 October 2021

Agenda Item 4: Air navigation deficiencies

PROGRESS OF THE AD HOC GROUP ON DEFICIENCIES

(Presented by Ad Hoc Group on Deficiencies)

SUMMARY

This paper outlines the progress to date of the ad hoc group tasked with assisting the ICAO Secretariat in identifying air navigation deficiencies in the meteorology field and assisting States in resolving existing meteorological service deficiencies. Revised text for the deficiencies action is proposed which will align the ad hoc group with more achievable activities.

Activity highlights include the development of a template for reporting on deficiency progress to MET SG and a suggested process for identifying deficiencies through the annual ICAO SIGMET test and through annual OPMET monitoring.

1. INTRODUCTION

1.1 At the 24th meeting of the Meteorology Sub-group (MET SG/24) the following decision was agreed:

Decision MET SG/24-05: *MET Deficiencies*
What: That a MET/S WG ad hoc group be formed* to work with relevant members of the MET/IE WG and, utilizing the guidance in the APANPIRG Procedural Handbook, Part V: *Uniform methodology for the identification, assessment and reporting of air navigation shortcomings and deficiencies* and other relevant ICAO documentation, assist the ICAO Secretariat with the following: a) Define a process, based on the APANPIRG Procedural Handbook, for identifying, analysing, removing and proposing MET Deficiencies; b) Develop templates to be used for Deficiency Corrective Action Plans (CAP), Progress Reports and Final Reports; c) Develop thresholds for Deficiencies based on OPMET Monitoring performance indicators and SIGMET testing; d) Review the analysis of the annual, and any ad hoc, OPMET Monitoring, and SIGMET Tests against agreed thresholds;

e) Identify deficiencies from the OPMET Monitoring and SIGMET Test analysis, along with other tests and exercises, mission reports, analysis of differences against ICAO provisions, aircraft accident and incident reports and reports provided by users of air navigation services; f) Work with States concerned to develop a CAP, arrange for testing and monitoring and assist with the reporting to ICAO on the resolution of air navigation deficiencies; and g) Report recommended updates to MET Deficiencies, through MET/S WG, to MET SG.
Why: To optimize the MET SG assistance to APANPIRG towards the identification and resolution of specific air navigation deficiencies in the field of aeronautical meteorological (MET) services.

1.2 Since that time, the ad hoc group referred to in MET SG/24-05 (herein referred to as the deficiencies ad hoc group) has progressed discussions on how best to undertake the work described in the decision.

2. DISCUSSION

Development of a Deficiency Resolution Progress Reporting Guide

2.1 The deficiencies ad hoc group has developed a *MET Deficiency Report Guide* (Refer Appendix A) which provides a template to assist States in providing a report to ICAO regarding progress on – or resolution of – an air navigation deficiency in the meteorology field. The *MET Deficiency Report Guide* has been provided to several States for potential use, with a request to provide feedback on its utility. No feedback has been received at the time of writing this paper.

2.2 The *MET Deficiency Report Guide* includes suggestions for information to be included in a paper to be presented at an ICAO Meteorology Sub-group and/or Meteorology Services Working Group meeting. The suggestions include outlining the deficiency details, the Corrective Action Plan (CAP) and progress towards its completion, and evidence of the resolution or progress. Examples of evidence may be confirmation of receipt of OPMET by Regional OPMET Databanks (RODBs), or letters provided from appropriate stakeholders (e.g. airlines, VAACs, the local ANSP).

Review of the APANPIRG Procedural Handbook

2.3 The group has reviewed information contained within the APANPIRG Procedural Handbook (APHB), pertaining to the **identification** of air navigation deficiencies. The APHB outlines the role of the ICAO Regional Offices in identifying air navigation deficiencies, listing methods to do so:

a) Compare the status of implementation of the air navigation facilities and services with the regional air navigation plan documents and identify facilities, services and procedures not implemented.
b) Review mission reports with a view to detecting deficiencies that affect safety, regularity and efficiency of international civil aviation.
c) Make a systematic analysis of the differences with ICAO Standards and Recommended Practices filed by States to determine the reason for their existence and their impact, if any, on safety.
d) Review aircraft accident and incident reports with a view to detect possible systems or procedures deficiencies.

e) Review inputs, provided to the Regional Office by the users of air navigation services on the basis of Assembly Resolution A33-14, Appendix M[1].

2.4 Items b) through e) outlined in paragraph 2.3 involve information and methods of deficiency identification that are only available and appropriate to the ICAO APAC office. Therefore, the deficiencies ad hoc group will assist the ICAO Secretariat on request with regards to those methods but will focus its work on item a) of the APHB methodology for identifying the status of implementation of meteorological services. Note, items b) through e) in paragraph 2.3 are also included in part e) of Decision METSG/24-05 (along with SIGMET test and OPMET Monitoring) – a proposal for their removal is outlined in paragraph 2.9 below.

2.5 When considering the APHB method a) '*Compare the status of implementation of the air navigation facilities and services with the regional air navigation plan documents and identify facilities, services and procedures not implemented*'; the deficiencies ad hoc group proposes the status of implementation to mean that meteorological products are being issued as per the eANP and in accordance with Annex 3 *Meteorological Service for International Air Navigation* and other relevant Annexes (eg Annex 10 *Aeronautical Telecommunications*). The deficiencies ad hoc group is not considering the accuracy of the products being disseminated; simply whether they are in conformance with the required formatting and transmitting standards. Any review of the accuracy of the products is expected to lie with State regulators and/or the ICAO APAC Office.

2.6 In determining status of implementation of meteorological services in accordance with the eANP the deficiencies ad hoc group considered the following means to do so with respect to the first two Volumes of the APAC Air Navigation Plan:

- Vol I, Table MET I-1 State Volcano Observatories
    - A review of the contents of Table MET I-1 was presented to MET/S WG/11 earlier this year, identifying States that could be invited to designate a State Volcano Observatory (SVO), as well as providing updates to existing SVO details. At the time of this paper, there have been no subsequent updates to Table MET I-1.
    - The deficiencies ad hoc group proposes setting up a regular regional VONA test from late 2023 (when VONA is expected to become a recommended practice in Annex 3) to assist SVOs in testing their VONA information dissemination and the receipt of VONA by appropriate organisations.
    - Vol I also includes the Volcanic Ash Advisory Centres and Tropical Cyclone Advisory Centres in the APAC region. The annual ICAO SIGMET test can also monitor the receipt of test VAAs/TCAs from these Centres, to ensure service implementation and correct dissemination.
- Vol II, Table MET II-1 Meteorological Watch Offices and Table MET II-2 Aerodrome Meteorological Offices
    - Review annual ICAO SIGMET test and OPMET monitoring results (as per MET SG/24-05 decision) and, where available, monitor IWXXM translation results as a method to identify the potential SIGMET and OPMET deficiencies and, where possible, identify cases of incorrectly formatted SIGMETs, TAFs and METARs.

2.7 The deficiencies ad hoc group noted that the METAR/SPECI and TAF requirements included in Table MET II-2 – *Aerodrome Meteorological Offices* are not aligned with the ROBEX bulletin contents, nor are the aerodromes listed in alignment with Table AOP I-1. Further, there are

[1] From A33-14: *The users of air navigation facilities and services should report any serious problems encountered due to the lack of implementation of air navigation facilities or services required by Regional Plans.*

aerodromes listed in Table MET II-2 that aren't included in Table AOP I-1 – usually due to an ICAO location code change that hasn't been applied to both Tables. Examples are Padang/Minangkabau in Indonesia – the code is WIEE in Table AOP I-1 and WIPT in Table MET II-2, and Tarakan/Juwata in Indonesia – WAQQ in Table AOP I-1 but WALR in Table MET II-2. Conversely, Nauru Airport is listed as AUUU in Table AOP I-1, but correctly as ANYN in Table MET II-2, and Nausori Airport listed as having code NFSU in Table AOP I-1 instead of NFNA. It may be useful for the ICAO Secretariat to determine what the actual requirements are and to ensure these are correctly reflected in each of the relevant eANP Tables, noting also that significant differences appear between Table AOP I-I and AOP II-1. Additionally, the deficiencies ad hoc group would like to remind States that the standard process for updates to these Tables is for States to provide details to the ICAO office on any necessary changes, using the appropriate Proposal for Amendment template on the ICAO site.

2.8 The deficiencies ad hoc group, in reviewing the eANP Vol II text, noted the following paragraph from Part V:

> *2.2 In the Asia and Pacific Regions, routine observations, issued as a METAR, should be made throughout the 24 hours of each day at intervals of one hour or, for RS and AS designated aerodromes[1] if so determined by regional air navigation agreement, at intervals of one half-hour at aerodromes as indicated in Table MET II-2.*

Where footnote 1 is: "*Refer to Table AOP II-1, Explanation of the table*". As already noted earlier, the Tables MET II-1, AOP I-1 and AOP II-1 are not aligned in the list of aerodromes included. The group would like to request clarification on which Table should be referred to in this paragraph.

2.9 Given the annual OPMET Monitoring activity is based on the ROBEX Handbook bulletin contents, the MET/IE may like to consider whether the monitoring process should reflect the APAC eANP Vol II OPMET requirements – as the ROBEX bulletins may contain further OPMET disseminated for domestic operations. An example to demonstrate this is the inclusion of Ha'apai/Pilolevu Airport on Lifuka Island, Tonga in the (*recently revised*) SAPS31 bulletin. This OPMET is for domestic operator use and should not automatically require inclusion in Table MET II-2, as the aerodrome is not considered necessary for international air navigation operations (Table AOP I-1 refers). Alternatively, the process for identifying potential deficiencies from OPMET monitoring may ensure that any low availability or compliance scores highlighted need to have that location listed in Table MET II-2 before a deficiency is considered. However, as noted in paragraph 2.6, Table MET II-2 may not reflect the most up to date requirements, so should be considered on a case by case basis.

2.10 Noting the issues and limitations identified by the deficiencies ad hoc group in undertaking this work, a rewording of the decision on deficiencies is proposed. In the proposed update of the Draft Decision below, parts c) through e) are removed as they are encompassed under part a), and part g) is removed, as it is covered under part f) "*…assist with the reporting to ICAO on the resolution of air navigation deficiencies*":

Draft Decision MET SG/25-xx: *MET Deficiencies*
What: That the MET/S WG ad hoc group formed to work with relevant members of the MET/IE WG and, utilizing the guidance in the APANPIRG Procedural Handbook, Part V: *Uniform methodology for the identification, assessment and reporting of air navigation shortcomings and deficiencies* and other relevant ICAO documentation, assist the ICAO Secretariat with the following:

a) Define a process, based on the APANPIRG Procedural Handbook, for identifying, analysing, removing and proposing MET Deficiencies, utilising the results of annual ICAO SIGMET tests and OPMET Monitoring activities;
b) Develop templates to be used for Deficiency Corrective Action Plans (CAP), Progress Reports and Final Reports; and
~~c) Develop thresholds for Deficiencies based on OPMET Monitoring performance indicators and SIGMET testing;~~
~~d) Review the analysis of the annual, and any ad hoc, OPMET Monitoring, and SIGMET Tests against agreed thresholds;~~
~~e) Identify deficiencies from the OPMET Monitoring and SIGMET Test analysis, along with other tests and exercises, mission reports, analysis of differences against ICAO provisions, aircraft accident and incident reports and reports provided by users of air navigation services;~~
~~f)~~ c) Work with States concerned to develop a CAP, arrange for testing and monitoring and assist with the reporting to ICAO on the resolution of air navigation MET ~~d~~Deficiencies~~; and~~
~~g) Report recommended updates to MET Deficiencies, through MET/S WG, to MET SG.~~

Why: To optimize the MET SG assistance to APANPIRG towards the identification and resolution of specific air navigation deficiencies in the field of aeronautical meteorological (MET) services.

Deficiencies Identification Through SIGMET Tests and OPMET Monitoring

2.11 The deficiencies ad hoc group has developed the *MET Deficiency Identification Guide*, to provide guidance on the identification and resolution of MET deficiencies. This guide is provided in Appendix B to this paper and is presented as a first iteration, to capture potential deficiencies from the annual ICAO SIGMET test and OPMET Monitoring. ICAO is invited to provide guidance on the OPMET Monitoring results that would trigger a deficiency investigation. It is anticipated that the *MET Deficiency Identification Guide* will be revised regularly as experience is gained and new, more effective methods of potential deficiency identification and investigation are devised.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) Consider the progress made by the deficiencies ad hoc group on and to provide feedback on:
   - The MET Deficiency Report Guide and Met Deficiency Identification Guide as provided in Appendices A and B, respectively; and
   - The revised Decision text in paragraph 2.10; and

b) Request the ICAO Secretariat to:
   - Review paragraph 2.2 in Part V of the APAC eANP Vol II, considering the issues outlined in paragraph 2.7; and
   - Provide guidance on the OPMET Monitoring results that would trigger a deficiency investigation.

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Appendix A - MET Deficiency Report Guide

International Civil Aviation Organization

WORKING or INFORMATION PAPER

Meeting information

Meeting location and date

USE OFFICAL MEETING WORKING PAPER OR INFORMATION PAPER TEMPLATE – THIS DOCUMENT PROVIDES GUIDANCE IN WRITING A PAPER BUT IS NOT THE OFFICAL MEETING PAPER TEMPLATE TO BE USED.

Agenda Item x: choose from provisional agenda items

UPDATE ON MET DEFICIENCY AP-MET-*xx*

(Presented by <*name of State or Organisation*>)

SUMMARY

<Use this section to summarise the paper e.g. This paper outlines the work done by <State name> on resolving deficiency AP-MET-xx. If this is a progress update to inform of actions taken to date, then use an information paper template. For providing information to support a deficiency resolution, use a working paper template.>

4. INTRODUCTION

4.1 *<Describe the deficiency – e.g. APANPIRG deficiency AP-MET-xx refers to METAR from xxxx aerodrome not being available on a regular basis.>*

5. DISCUSSION

Corrective Action Plan and Implementation

5.1 *<Use this section to describe the actions taken or planned to resolve the deficiency e.g. regular METARs are now provided from the aerodrome or an AWS will be installed later in the year or information on volcanic activity is now provided to various organisations. Give*

some details on how these corrective actions help resolve the deficiency. The Corrective Action Plan can be provided as an attachment to the paper.>

Evidence of MET deficiency resolution

5.2 *<Use this section to outline evidence of deficiency resolution or progress – e.g. letter from local airlines, ATS, MWO, VAAC, etc and/or results from OPMET monitoring, results of SIGMET test or other evidence as appropriate. Evidence such as letters can be included as an appendix to the paper and be referred to in this section.>*

6. ACTION BY THE MEETING

6.1 *<If this is a working paper, you can request the meeting to carry out an action – e.g. agreeing that the deficiency should be resolved and making a recommendation to APANPIRG to remove it from the deficiency list. If this is an information paper, you can request the meeting to note the progress of the deficiency resolution work.>*

[Example for WP]

3.1 The meeting is invited to:

i. Note the information contained in this paper; and
ii. formulate a Draft Conclusion for the removal of the deficiency AP-MET-xx from the APANPIRG Deficiency Database.

[Example for IP]

3.1 The meeting is invited to note the information on the progress of the deficiency resolution work contained in this paper.

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<If adding attachments such as letters or monitoring results, include them here under the main body of the paper.>

Appendix B - MET Deficiency Identification Guide

MET Deficiency Identification Guide

Purpose

Analysis of the annual ICAO SIGMET test and annual OPMET Monitoring activities by the APAC RODBs may highlight potential air navigation deficiencies in the meteorology field. This document is aimed to provide guidance on identification of potential deficiencies, with a focus on first assisting States in undertaking a root cause analysis to determine whether the issue may be resolved quickly (minimum resolution time to be determined on a case by case basis). A deficiency is to be applied only when there is no simple resolution planned and undertaken. Other sources of MET deficiency information may also be provided by the ICAO Secretariat and the principle of root cause analysis to determine an appropriate response will also be used.

Note – the identification of a deficiency can be an opportunity for a State to use as evidence for the need for increased resources and/or assistance.

Method

1. Annual ICAO SIGMET test

Following finalisation of the results of the annual ICAO SIGMET test, the following criteria will indicate when a possible MET deficiency should be considered:

a) An expected SIGMET is not received by *any* RODB during the test.

- If a SIGMET is received by 4 or less RODBs, then the MWO shall be requested to update their dissemination list to include all RODBs and a test SIGMET shall be issued to confirm this update.

b) An expected SIGMET cannot be ingested by user systems.

- A SIGMET may contain format errors. Minor errors such as priority indicators should be communicated directly to the MWO for resolution, followed by a test SIGMET being issued to confirm the correct format/bulletin information.

c) A SIGMET is not received by *any* RODB within 5 minutes of issuance (referring to Annex 3 Appendix 10 section 1.1 "*Messages and bulletins containing operational meteorological information shall achieve transit times of less than 5 minutes, unless otherwise determined to be lower by regional air navigation agreement*.").

- States to undertake root cause analysis, with assistance from deficiencies ad hoc group, to determine reason for slow dissemination or receipt (eg internal process requiring email to ATS to disseminate via AFS on behalf of MWO).

Notes

1) Deficiencies ad hoc group to recommend whether follow up SIGMET tests should be conducted to ensure SIGMET issues have been resolved

2) While the items above discuss SIGMET issuance, they can equally apply to VAA and TCA issuance.

2. APAC RODB Annual OPMET Monitoring

Following finalisation of the results of the APAC RODB Annual OPMET Monitoring, the following criteria will indicate when a possible MET deficiency should be considered:

a) A METAR/SPECI or TAF for aerodromes in Table MET-II-2 is not received by *any* RODB during the test.

- If a METAR/SPECI or TAF is received by 4 or less RODBs, then the NOC or ROC shall be requested to update their dissemination list to include all RODBs and the RODBs will be requested to confirm receipt, once complete.

b) A Table MET-II-2 METAR/SPECI or TAF with an availability/regularity/compliance score of less than 50% (threshold to be reviewed regularly).

- NOC to provide information to explain score. If resolution can be made quickly, then RODBs will be requested to confirm resolution by compiling one month's statistics, once complete. If resolution requires a longer term (ie greater than 3 months, but to be determined on a case by case basis), consider deficiency.

3. Any other potential deficiency source

The ICAO Secretariat may identify other sources of information that could indicate a MET deficiency and, if appropriate, request the ad hoc group on deficiency under MET/S WG to assist with root cause analysis.

Deficiency Resolution Support

Once a MET deficiency has been applied (and for existing MET deficiencies), the following steps may be followed by the ad hoc group on deficiencies:

1. Engage with State holding a deficiency, to assist in carrying out a root cause analysis of the issue.

2. Develop a Corrective Action Plan (template to be developed) in coordination with the State to resolve the issue and collect evidence to show resolution. This may include the development of tests/exercises to support the deficiency resolution.

3. Assist State in compiling a report to ICAO, outlining evidence of resolution deficiency.

Note – the ad hoc group on deficiencies will assist the State in the deficiency resolution, but the State is responsible for the work being carried out and for ensuring the resolution remains in place.